RESIDENCY TRAINING IN NEUROPATHOLOGY

Table of Contents

RESIDENCY TRAINING IN NEUROPATHOLOGY

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA

http://www.royalcollege.ca/portal/page/portal/rc/public

General Information by Specialty

Objectives of training and specialty training requirements in Neuropathology
Specific Standards of Accreditation for Residency Programs in Neuropathology
Examination Dates
Examination Format & Digitized Images
Final in-Training Evaluation Report (FITER)/Comprehensive Competency Report (CCR)

RESIDENCY PROGRAM COMMITTEE

TERMS OF REFERENCE

PURPOSE

To supervise and provide leadership in all aspects of Postgraduate Clinical Education in the specialty of Neuropathology within the Faculty of Medicine, University of Calgary and its affiliated teaching hospitals.

MEMBERSHIP OF THE COMMITTEE

All members of the Committee must recognize that while their appointment to the Committee may be to ensure representation of a particular group or teaching hospital, as a member of the Committee they must act in a manner which places the "overall good" of the educational program ahead of any specific group or geographic interest.

COMPOSITION

1. Program Director (Chair)
   - Dr. Denise Ng
2. Assistant Program Director
   - Position unfilled
3. Neuropathology Faculty
   - Dr. Jeff Joseph, Dr. Ana Nikolic
4. Chief Resident (Resident's Representative)
   - Dr. Christopher Newell
5. Research Chair (also Neuropathology Faculty)
   - Dr. Jennifer Chan
6. Site Liaison ACH
   - Dr. Marie-Anne Brundler
7. Site Liaison OCME
   - Dr. Akmal Coetzee-Khan
8. Program Administrator
   - Ms. Kristy Campbell
9. Program Director of Anatomic Pathology (ex officio)
   - Dr. Carolin Teman
10. Program Director of General Pathology (ex officio)
    - Dr. Davinder Sidhu
11. Professor and Head, Department of Pathology (ex officio)
    - Dr. Dylan Pillai

RESIDENCY TRAINING IN NEUROPATHOLOGY

ROLE OF COMMITTEE

a) Assessment of resident applications for training positions in neuropathology.
b) Interview prospective candidates and prioritize for matching through CaRMS.
c) Define and update objectives of the five year neuropathology training program.
d) Continue to develop, monitor, and evaluate the appropriateness of the neuropathology education program.
e) Establish and approve specific rotations for individual residents recognizing and attempting to accede to specific requests as long as these are in keeping with aims of the educational program.
f) Ensure that regular resident in-training evaluations occur.
g) Provide information, constructive criticism and guidance to residents resulting from bi-monthly evaluations or more frequently if required (i.e. remediation or probation).
h) To receive and review appeals from residents relating to in-training evaluations and where appropriate forward to PGME.
i) To organize rotations for neurology, neurosurgery, and neuroradiology residents, to evaluate and to provide assessments to their program directors.

DURATION OF APPOINTMENT

Program Director - 5 years, renewable once.

Terms and Selection

Program Director

Selection of a candidate for Program Director will be by the Pathology and Lab Medicine Department Head with recommendation from the Neuropathology Program Committee and the departmental membership. Subsequent to the agreement of the Associate Dean (PGME) and finally agreement of the Dean that the nomination is appropriate, the formal appointment is made. The Associate Dean PGME notifies the Clinical Section Chief, the nominee, the PGME committee, and the appropriate national accrediting body of the appointment. Appointments are normally for a term of 5 years, renewable once, assuming continued satisfactory performance by the incumbent and the continued support of the Division Head.

Assistant Program Director

Selection of a candidate for Assistant Program Director will be by the Pathology and Lab Medicine Department Head with recommendation from the Neuropathology Program Committee and the departmental membership. Subsequent to the agreement of the Associate Dean (PGME) and finally agreement of the Dean that the nomination is appropriate, the formal appointment is made. The Associate Dean PGME notifies the Clinical Section Chief, the nominee, the PGME committee, and the appropriate national accrediting body of the appointment.

Departmental Members

The Program Director with the advice of the Assistant Program Director, after consultation with the Department Head, appoints individual committee members. These members are normally chosen because of their interest in graduate clinical education and their specialty training in Neuropathology.

Resident Members

The residents have elected to elect the Chief Resident of Neuropathology to act as the Resident Representative on the RPC. When there is no Chief resident in Neuropathology the most senior resident is the primary and the next most senior is the alternate.

Quorum

Quorum consists of program director, 1 resident representative, and 2 other members of the committee.

Frequency of Meetings

Meetings are held every 8-9 weeks with Ad hoc meetings at the call of the Program Director or the Assistant Program Director.

Agenda and minutes are circulated (via email) prior to or at the beginning of each meeting by the Program Administrator.

Scope of Activities

The Residency Program Committee is responsible for:

a. Development of a clear program plan, including objectives relating to knowledge, skills and attitudes, and based upon the general objectives of training in Neuropathology as published in the specialty training requirements of the College.

b. Conduct of the program, including the rotation of residents to ensure that each resident is advancing and gaining in experience and responsibility in accordance with the educational plan.

c. Selection of candidates for admission to the program, in accordance with policies determined by the Faculty of Medicine, Post Graduate Medical Education Committee.

d. Establishment of mechanisms to provide career planning and counseling for residents and to deal with problems such as those related to psychological stress.

e. Assessment of performance of each resident through a well organized program of in-training evaluations. This will include the final evaluation at the end of the program as required by The College.

f. Biannual review of rotation evaluations (ITERs) of neuropathology trainees to ensure trainees are fulfilling program expectations.

g. Maintenance of an appeal mechanism. The Residency Program Committee will receive and review appeals from residents and, where appropriate, refer the matter to the Postgraduate Medical Education Committee.

h. Biannual review of teaching evaluations of the neuropathology teaching faculty.

ROLES AND RESPONSIBILITIES

Evaluation of Teaching Faculty

To fulfil the requirements of the Royal College of Physicians and Surgeons and to follow up on the quality of the teaching within the Neuropathology Residency Training Program; the Program will institute a schedule of reporting on Faculty Teaching every 6 months to ensure the anonymity of the residents within such a small program.

Procedure:

1. On or about June 1st and December 15th of each academic year anonymous reports will be pulled from One45 and given to the RPC Chair for review of staff teaching performance.

2. These reports will be reviewed and signed off by the chair (and/or Department Head) and any problems or deficiencies identified will be discussed with the staff involved and the Department Head if necessary.

3. The dated and signed off report including a summarizing cover sheet will be kept on file for a period of time to be determined by the retention guidelines of the PGME.

Evaluations of the Neuropathology Program

To fulfil the requirements of the Royal College of Physicians and Surgeons and to follow up on the quality of the Neuropathology Residency Training Program; the Program will institute a schedule of reporting on the Program Evaluation forms once yearly to ensure the anonymity of the residents within such a small program.

Procedure:

1. On or about June 1st and December 15th of each academic year anonymous reports will be pulled from One45 and given to the RPC chair for review of the Neuropathology Training Program.

2. These reports will be reviewed and signed off by the chair and any pertinent comments, including any problems or deficiencies identified, will be discussed with the RPC and the Department Head if required.

3. The dated and signed off report including a summarizing cover sheet will be kept on file for a period of time to be determined by the retention guidelines of the PGME.

4. Reports will only be generated on 4 or more responses to ensure anonymity

Program Review

It is determined that at least one component of the Neuropathology Program will be reviewed at each meeting. This will be a standing agenda item and the results of the discussion will be recorded in the minutes.

Career Planning

Career planning is addressed several times over the course of residency. It is a specific agenda item at each quarterly review meeting between the Program Director and each resident, starting in the PGY-1 year. Career questions and comments are free to be discussed during this time.

A more formal and focused discussion on career planning, goals and aspirations will be done on the first day in PGY3. A scheduled 30 - 60 minute meeting will be held between the resident and the Program Director.

The Program Director will meet with each resident quarterly (or more frequently if requested/required due to circumstance) and discuss the results of the evaluations and provide guidance to the resident. These meetings are documented using a short form and kept in the resident file.

Additional discussions can be with a staff member (or mentor) of your choice but updates to your goals should be documented in your quarterly meeting with the Program Director and any mentoring should be recorded as well. Residents are strongly encouraged to become active members in the learned societies of the neuropathology community where they may network with other faculty and trainees from across the country and internationally.

RESIDENT EVALUATION PROCESS

To fulfil the requirements of the Royal College of Physicians and Surgeons Accreditations and for follow up on the quality of resident learning within the Neuropathology Residency Training Program the program will institute a schedule of reporting and reviewing In-Training Evaluation Reports every 6 months throughout the length of each residents training. These reviews are for documentation purposes and will not be discussed with the resident.

PGY-1

The PGY1 year is a clinical set of rotations, largely based out of the Rockyview General Hospital. A specific set of objectives for the PGY1 year has been devised for the Neuropathology resident in training. A formal written evaluation (in the form of a web evaluation or ITER on One45) is filled out by the preceptor(s)/attending(s) after completing each rotation. The evaluation is reviewed and electronically signed off by the resident on One45 and the evaluation shall be made available to the Program Director for review.

PGY-2

The PGY2 resident will receive in-training evaluations (via One45) at end of every subject based rotation/block in his/her anatomic pathology year and he/she must successfully complete this year before entering into their core neuropathology years. An informal mid rotation assessment will be carried out with rotations longer than twelve weeks (or three blocks).

PGY-3, PGY-4, & PGY-5

Promotion to the next PGY level during Neuropathology Core Training will depend on the meeting the following criteria:

a) Completion of evaluation forms on One45 by neuropathology faculty which will be collected into a summary evaluation format and delivered to the resident for review on One45. Consensus/Summary data will have a rating of 2.0 out of 3.0 or above to consider the rotation a PASS. Additionally, each resident's progress will be discussed and a consensus reached at each RPC meeting.

b) Examinations, utilizing a similar format as the Royal College of Physicians and Surgeons of Canada. Examinations must show adequate gain of knowledge and application of said knowledge. NPISE Exams are compared with US Fellows in the same year of study.

c) Should a resident be in an off-site rotation, then the evaluation form will be completed by the supervisor/preceptor at that site.

d) Successful review by the program director of all individual assessments; and/or Bi-Annual ITER review by the RPC.

During the PGY5 year, a final in-training evaluation (FITER) will be completed and forwarded to the Post Graduate Office and the Royal College. A certificate of completion of training is issued from Postgraduate Medical Education upon satisfactory completion of training.

Summary:

The following chart is a summary of the above:

ROTATION	TIME
PGY 1 Clinical	End of Rotation (one block intervals)
PGY 2 Anatomic Pathology	End of Rotation (one block intervals)
PGY 3-5 Neuropathology	End of Rotation (every two months)
Mandatory and Elective	End of Rotation

PGME RESIDENCY TRAINING POLICIES

All Post Graduate Medical Education Residency Training Policies can be found here:
http://medicine.ucalgary.ca/pgme/current-trainees/residency-training-policies

The Neuropathology Residency Training Program abides by all Policies and Procedures set forth by the University of Calgary Post Graduate Medical Education Office. Actual practice (as outlined above) by this office may be enhanced or require further detail in certain situations (i.e. Remediation and Probation), PGME policies shall be the required minimum standard in all situations.

CanMEDS 2015

The CanMEDS Framework

The CanMEDS framework is a guide to the essential abilities physicians need for optimal patient outcomes. Fundamentally, CanMEDS is an initiative to improve patient care. The framework defines the competencies needed for medical education and practice. This framework of core competencies are organized thematically around 7 key physician Roles:

- Medical Expert
- Communicator
- Collaborator
- Leader
- Health Advocate
- Scholar
- Professional

The CanMEDS name, which has become well known nationally and internationally, is a derivative from "Canadian Medical Education Directives for Specialists". The CanMEDS diagram graphically illustrates the centrality of the Role of Medical Expert. The diagram also shows the interconnectedness of the other Roles.

The CanMEDS initiative began in the 1990's by the Royal College of Physicians and Surgeons of Canada. In the context of a rapidly changing health care environment, it was felt that the roles and abilities required of physicians needed to be further defined and explored. The College identified patient consumerism, government regulations, financial constraints, medical information on the Internet, litigation, technology and the explosion of medical knowledge as forces changing the nature of health care delivery. Within this context, the question arose:
"*How can we best prepare physicians to be effective in this environment and truly meet the needs of their patients?*

The CanMEDS initiative has involved hundreds of members of The Royal College, The College of Family Physicians of Canada, educators and other contributors over the last decade. The framework is relevant to multiple stakeholders-educators, teachers, trainees, practising physicians, researchers and other health care professionals. For the trainee, an understanding of the CanMEDS competencies will provide an overall or "big picture" understanding of their training program. As well, many residency education programs are using CanMEDS standards in their in-training assessments and examinations and in preparation for accreditation.

Are you familiar with the Roles?

CanMEDS Competencies

The CanMEDS framework is competency based. "Competencies" are important observable knowledge, skills and attitudes. These competencies have been organized around the physician roles. These seven roles have been clarified and defined by key competencies.

Each key competency has been further outlined into multiple enabling competencies. The enabling competencies specify the behaviors, skills and attitudes that must be displayed by the postgraduate learner.
These enabling competencies are outlined in detail in the CanMEDS framework document and are planned for use in resident evaluation.

Each module in this series will also link to the list of the key and enabling competencies associated with that Role.

Each CanMEDS Role also has a list of "Elements" which are a series of terms or phrases that describe the Role in more detail. The elements can be used to further define each Role. These descriptors or elements can be used to

understand the Role in more detail. Click on the link above to visit the Can Meds website.

CURRICULUM OUTLINE

The neuropathology training program must include one year of basic clinical training. Our pre-specialty clinical year is designed to meet the requirements of our specialty program and, in addition, prepare the resident for the Medical Council of Canada Qualifying Exam, Part II.

PGY-1

Rotation	Length	Rotation	Length
Orientation	4 weeks	Anatomy	4 weeks
Neurooncology/Neurology Clinics	4 weeks	ER	4 weeks
Pediatric Neurology	4 weeks	Peds Oncology	4 weeks
Surgical Oncology	4 weeks	Neuropathology	4 weeks
Neurology	4 weeks	Neurosurgery	4 weeks
Internal Medicine	4 weeks	Elective	4 weeks
Neuroradiology	4 weeks		

A year of clinical training in an internal medicine training program is an acceptable option.

PGY-2

The PGY2 year includes experience in general surgical, autopsy, paediatric pathology, cytopathology and forensic pathology. Expectations for neuropathology trainees are identical to those for PGY-2 anatomic pathology residents in nearly all rotations (with the exception of Cytology where NP specific Goals and Objectives are in place). All objectives documents are included in this manual.

PGY-3&4

Two of the three years of neuropathology training (PGY 3 & 4) are spent acquiring, with carefully graded responsibility specialty-specific, teaching and management skills. Trainees will also gain experience in neuropathological applications of new technology including immunopathology, molecular pathology, electron microscopy, flow cytometry and image analysis.

A two week Molecular Pathology elective will be arranged in PGY 4 or 5 as well as a second Block of Forensic Pathology concentrating on Neuropathology, a two week Neuropath Cytology Block, and an optional 2 week Occular Pathology Block.

PGY-5

The remaining year (PGY5) is an elective year which may be adapted to the interest and skills of the individual resident and may include service, clinical or research rotations or any combination thereof. It will also include one mandatory block of Lab Informatics with Dr. Naugler at DSC. (This block can also be taken in PGY4 at the discretion of the RPC.)

Research

There are active research programs in neuro-degenerative disorders, neuro-regeneration, cerebral ischemia and neuro-oncology. Active participation by trainees in one or another research program will be strongly encouraged. Please also see the section on Research later in this manual.

Teaching

Residents have the opportunity to participate in teaching medical students, occasionally nurses and other health professionals as well as their resident peers. It is *strongly* recommended that each resident contribute to and help maintain the neuropathology topical slide collection in the residents' room.

RESIDENCY TRAINING IN NEUROPATHOLOGY

GENERAL STRUCTURE

Program Year	Content and Sequence of Rotations Number of Months (or 4-week blocks)												
	1	2	3	4	5	6	7	8	9	10	11	12	13
First	Path. Orient	Surg Onc	IM	Neuro Onc/Clinics	Neuro	Neuro Rad	ER	Peds ER	Ped Neu	Neuropath	Anat	Neuro surg	Elec

	1	2	3	4	5	6	7	8	9	10	11	12	13
Second	Path Orient	Autopsy & Surgical Path FMC						Cyto DSC	Surgpath (Not FMC)	Surgpath (Not FMC)	Paed Path ACH		Forensic Path OCME

	1	2	3	4	5	6	7	8	9	10	11	12	13
Third	CORE NEUROPATHOLOGY – Surgical & Autopsy (Paediatric & Adult), Forensic Consults, & Nerve & Muscle											Cyto 2 wk	Molec. 2 wks
Fourth	CORE NEUROPATHOLOGY – Surgical & Autopsy (Paediatric & Adult), Forensic Consults, & Nerve & Muscle											Forensic NP OCME	
Fifth	Lab Infor-matics	Diagnostic Neuropathology or Research or additional electives/selectives											

MANDATORY CONTENT OF TRAINING

Description		Duration	Sites in which this training may be taken
PGY1	General Clinical Rotations	5 Blocks	Rockyview Hospital, Foothills Medical Centre, Alberta Children's Hospital. Alberta Childrens Hospital
	Anatomic Pathology, Pathology Anatomy, Neurology, Neurosurgery, Neuroradiology, Neuropathology Neurooncology/Clinics Elective	8 Blocks	Foothills Medical Centre
PGY2	Surgical & Autopsy Rotations	9 Blocks	Foothills Medical Centre, Rockyview Hospital , Peter Lougheed Centre & Diagnostic Scientific Centre
	Paediatric Pathology	2 Blocks	Alberta Childrens Hospital
	Forensic Pathology	1 Block	Medical Examiner's Office
	Cytology	1 Block	Diagnostic Scientific Centre

PGY3 &4	Neuropathology, Paediatric Neuropathology, Electron Microscopy (2 blocks), Forensic Neuropathology (1 blocks) Molecular (1 wk), Neuropath Cytology (2 wks)	26 Blocks	Foothills Medical Centre, Alberta Children's Hospital Office of the Calgary Medical Examiner Molecular Pathology Laboratory Diagnostic Scientific Centre
PGY5	Lab informatics (1 block) Diagnostic Neuropathology or Research etc	13 blocks	Diagnostic Scientific Centre Foothills Medical Centre

ELECTIVE CONTENT OF TRAINING

Description	**Duration**	**Sites or other institutions in which this training may be taken**
Clinical Neurology	6 blocks	Foothills Medical Center
Clinical Neurosurgery	6 blocks	Foothills Medical Center
Clinical Neuropathology	6 blocks	Foothills Medical Center
Experimental Neuropathology	12 blocks	Foothills Medical Center
Research Related to any of Basic Neurosciences	12 blocks	Health Sciences Center
Opthamolopathology/Occular Pathology	1 block	Rockyview General Hospital
Anatomic Pathology Sub-specialty (Bone & Soft Tissue, Head & Neck)	1 block ea	Foothills Medical Center
Other requests would be considered by the Residency Training Committee		Any other Canadian Institution

Overall Neuropathology Program Objectives

In keeping with the Objectives of Training in the Specialty of Neuropathology as set forth in the 2011 Royal College document, the Neuropathology Program at the University of Calgary has the following Overall Goals and Objectives:

Medical Expert

1. To provide the resident with the requisite skills to effectively practice as a consultant neuropathologist in any setting
2. To achieve this by providing the appropriate mix of didactic and interactive teaching and by promoting self-directed learning
3. To ensure the resident has the requisite procedural skills to ensure their ability to effectively practice as a consultant neuropathologist in any setting

Communicator

1. To impart the importance communication skills to elicit relevant information about patients from clinical colleagues, family and other professionals in order to provide optimal medical care
2. To impart the importance of effective communication of diagnostic information to clinical colleagues in the interest of providing optimal patient care
3. To be able to convey medical information to family and non-medical experts in an effective manner

Collaborator

1. To impart the necessity of effective collaboration with other health professionals in order to provide optimal patient care
2. To be able to deal with interpersonal conflicts in such a way as to prevent an adverse impact of patient care
3. To understand the importance seeking from and providing consultation to neuropathology colleagues in order to assure that the best quality of patient care is delivered

Leader

1. To understand the necessity of quality assurance and improvement in the optimum functioning of a neuropathology laboratory
2. To be able to function effectively as an administrator of finite health resource to provide the best possible patient care
3. To facilitate the acquisition of skills to undertake laboratory management, and perform quality assurance and quality control measures in a professional manner

Health Advocate

1. To understand the role of the neuropathologist in advocating for and promoting the best care for the patient
2. To understand the role of the neuropathologist in advocating for broader health care of the populations they serve

Scholar

1. Facilitate development of resident skills for independent, reflective, life-long learning
2. Encourage and promote research and its translation into the improvement of neuropathology practice
3. To encourage and foster the education of students, residents, and other health care officials

Professional

1. To instill the values of honesty, integrity and commitment to the best patient care possible
2. To instill the values of honesty, integrity and collegiality when dealing with colleagues, consultants and other members of the health care team

RESIDENCY TRAINING IN NEUROPATHOLOGY

We achieve these by:

1. **CURRICULUM:**
    a. Provide an effective, up to date curriculum to prepare the resident to effectively practice asa consultant neuropathology in any setting
    b. Provide the appropriate mix of didactic and interactive teaching and promote self-directed learning
    c. Ensure that all of the required goals, objectives and specific standards set by the Royal College Physicians and Surgeons of Canada Specialty Committee for Neuropathology training are met

2. **TEACHING:**
    a. Attract, support and retain neuropathology faculty who are effective teachers and expert diagnostic neuropathologists
    b. Provide strong interaction with our allied fields of neurology, neurosurgery, neuroradiology and neurosciences in order to enhance the resident learning experience
    c. Provide high quality teaching, supervision and mentoring to residents

3. **LEARNING:**
    a. Graduate residents who are competent diagnostic neuropathologists able to practice in a variety of settings
    b. Facilitate development of resident skills for independent, reflective, life-long learning
    c. Foster leadership capabilities and teaching skills
    d. Encourage and promote research and scholarship
    e. Facilitate the acquisition of skills to undertake laboratory management, and perform quality assurance and quality control measures in a professional manner

4. **RESIDENTS:**
    a. Recruit high quality trainees to our neuropathology program
    b. Fill available Residency Training positions on 1st iteration CaRMS match
    c. Structure program so that all residents complete their studies and achieve competency in neuropathology in the allotted time

5. **ENVIRONMENT:**
    a. Provide a safe, supportive, collaborative teaching and learning environment.
    b. Support the health and well-being of our residents and staff.

6. **ASSESSMENT and EVALUATION**
    a. Use thorough, clear and constructive methods of resident assessment
    b. Consistently use thorough, transparent and constructive methods of faculty evaluation and feedback
    c. Provide regular, clear and effective ongoing program evaluation
    d. Prepare all residents to pass the RCPSC Neuropathology specialty examination

7. **ADMINISTRATION:**
    a. Provide effective and efficient administrative processes which support all aspects of our program

8. **ACCREDITATION**
    a. Maintain full accreditation by the Royal College of Physicians and Surgeons of Canada
    b. Earn a reputation as one of the premier neuropathology training sites in Canada

9. **SOCIAL ACCOUNTABILITY**
    a. Prepare trainees to be an integral participant in health care organizations, organizing sustainable practices, making decisions about allocating infinite resources, and contributing to the effectiveness of the health care system.
    b. Prepare trainees to responsibly use their expertise and influence to advance the health and well-being of individual patients, communities, and populations.

PGY SPECIFIC OBJECTIVES

PGY-1: CLINICAL

GOALS

The goals of the PGY1 year are to provide a broad background in clinical medicine, to provide exposure to many medical and surgical services that rely heavily on the pathology laboratory, as well as the major clinical neuroscience specialties, and to prepare the trainee for the Medical Council of Canada Qualifying Examination.

GENERAL OBJECTIVES

At the completion of the year, the trainee is expected to demonstrate:

a) the ability to diagnose and manage in a hospital and ambulatory setting, adult and paediatric patients with common medical, surgical, and neurological diseases.
b) the ability to triage the critically ill and to set priorities in management.
c) the ability to manage the initial stabilization of the patient with multisystem failure due to disease or trauma.
d) the ability to manage common problems arising in the pre and post operative periods.
e) the ability to appropriately request an autopsy.
f) the ability to perform an autopsy and to dissect some common surgical pathology specimens.
g) the ability to appropriately order laboratory tests.
h) the ability to effectively use personnel, equipment, and other resources.
i) the ability to explain and justify operative procedures to patients.
j) the ability to appropriately refer patients to specialty consultants and community services.
k) the ability to provide emotional support for patients and their families.
l) the ability to elicit active participation of patients and their families in the patient's care where appropriate.

Regardless of the rotation, the trainee is expected to make every attempt to review with the attending, any tests pertaining to their patients, and to present when an autopsy is being performed on any of their patients.

ROTATION SITES

Most clinical (PGY1) rotations will take place at the Rockyview Hospital and are coordinated by Dr. Ryan Lenz. The Clinical Neuroscience Rotations are based at the Foothills Medical Centre and are co-ordinated by the Neuropathology Program Administrator. The rotation in Neuropathology/Anatomic Pathology will take place in the department of Pathology at the Foothills Medical Centre, and will be coordinated by the Neuropathology Residency Program. This rotation is not to be taken during the Christmas/New Year period, nor is vacation to be taken during this rotation.

ROTATION SPECIFIC OBJECTIVES

See attached Rotation Specific Objectives Documents. These are also available on One45.

EVALUATIONS

The trainees' performance after each rotation will be completed by the designated supervisor on One45. The Program Director will review these each block and sign off.

The trainee will complete evaluations of the rotations(s) and preceptor(s) and/or Program following each rotation, and these will be also be reviewed by the program director and/or the Department Head.
Unsatisfactory evaluations of rotations are communicated to the PGY1 Multidisciplinary Education Committee.

RESIDENCY TRAINING IN NEUROPATHOLOGY

PGY-1 - Neuropathology Introduction Objectives (Block 2)

Medical Expert

- ✓ Understand some fundamental principles of neuroimaging, including the mechanisms of contrast in CT and MRI imaging
- ✓ Know the major neuroanatomic structures by name and be able to identify these structures in the brain and in neuroimaging
- ✓ Know the specificity and basic chemical principles of stains in neuropathology
- ✓ Know how tissues sections are processed and prepared for microscopic examination
- ✓ Know some of the neuropathophysiology and neuropathology of basic reactions in the brain (e.g. demyelination, amyloid deposition, neoplastic transformation)

Communicator

- ✓ Prepare clear and concise pathology reports
- ✓ Learn the value and structure of synoptic reports, as well as their limitations

Collaborator

- ✓ Interact with physicians requiring neuropathology, both to obtain additional clinical information and to communicate neuropathological findings
- ✓ Work with the technical staff to optimize how tissue is handled (e.g. how to orient a specimen, preordering stains or blanks in select cases)

Leader

- ✓ Balance competing factors that demand your time and attention
- ✓ Critically evaluate stains for their quality, including their specific problems and have how they might be improved
- ✓ Critically evaluate the effectiveness of stains, noting in particular how or if they have enhanced the evaluation of a specimen

Health Advocate

- ✓ Attend neurooncology and other relevant rounds

Scholar

- ✓ Maintain a log of all encountered cases, preferably additionally noting your observations, comments, and questions
- ✓ Learn more sophisticated techniques for literature searches and how to download references from the library
- ✓ Present at rounds or at informal microscopic sessions

Professional

- ✓ Be punctual to rounds, teaching sessions, and other meetings
- ✓ Preview cases prior to sign-out and prepare preliminary observations
- ✓ Write up cases in a timely manner
- ✓ Maintain good rapport with support staff, including secretaries, administrative assistants, and histotechnologists

RESIDENCY TRAINING IN NEUROPATHOLOGY

PGY-1 - Pathology Introduction – Objectives (Block 1)

Overview

This 4-week orientation block introduces the basic operations of the Anatomical Pathology division at Calgary Laboratory Services. The first week includes introductions to the Lab Managers/Supervisors, a brief overview of the relationship between the University of Calgary and Calgary Laboratory Services, a tour of the FMC facilities, a review of general safety procedures in the lab, distribution of important paperwork from the Program Administrator, an introduction to our Clerical Services and Lab Information System, and of course, meeting and interacting with other residents and staff (mainly) at the FMC site.

Residents spend the remaining 3 weeks predominantly observing on the Surgical Pathology and Autopsy services. They will be closely supervised at all times by either: a Senior Resident, a Senior Path Tech, or a Staff Pathologist.

Towards the end of the block, they will begin to dissect simple surgical specimens, review related slides, write histological descriptions, and begin to formulate simple and straightforward surgical pathology reports. The PGY1 will also assist with the dissection and slide review in straightforward autopsy cases.

Objectives

Medical Expert

- ✓ Begin to recognize common pathological processes (gross and microscopic) in the major organ systems (breast, gastrointestinal tract, skin, CNS, respiratory, cardiovascular, endocrine, genitourinary, hematopoietic, and bone and soft tissue)
- ✓ Demonstrate a sound knowledge of safety procedures in the department
- ✓ Understand what constitutes a proper consent for post-mortem examination

Communicator

- ✓ Communicate clearly and consistently with all staff and co-workers with regards to meeting times, expectations, questions and answers.
- ✓ Document gross descriptions and histological findings by dictating or handwriting preliminary surgical and autopsy reports.

Collaborator

- ✓ Under guidance, disseminate patient information/diagnoses to clinicians in a timely manner, and as appropriate, to facilitate optimal patient care

Leader

- ✓ Become familiar with the basic organizational structure of Calgary Laboratory Services
- ✓ Prioritize his/her time efficiently during this rotation so that the goals and objectives are met
- ✓ Gain a basic knowledge of the LIS (how to log in to the system, how to find a report, how to do a search for previously issued reports, etc)

Health Advocate

- ✓ Identify the important determinants of health affecting patients
- ✓ When appropriate, reinforce to the public and the profession the essential contribution of laboratory medicine to health

Scholar

- ✓ Utilize appropriate self-assessment strategies to identify potential areas for self-improvement
- ✓ Attend and participate in the weekly didactic half-day, as scheduled (with the exception of neuropathology didactic periods)

Professional

- ✓ Act as an appropriate role model for students and others
- ✓ Demonstrate a professional attitude to colleagues and other laboratory staff

PGY-1 - Paediatrics (Wards) Objectives

Medical Expert

- ✓ Learn to obtain a concise and relevant history from the patient or their caregivers
- ✓ Perform an age-appropriate examination and appreciate how such an examination differs from that in adults
- ✓ Generate age-appropriate differential diagnoses, based on the history and examination
- ✓ Suggest testing that would narrow the diagnosis and suggest treatments appropriate for those diseases
- ✓ Learn and be able to assess developmental milestones
- ✓ Learn the general categories of major pediatric diseases (e.g. infectious diseases of infants, inherited metabolic diseases, child abuse, neoplasia), their clinical manifestations, and their sequelae

Communicator

- ✓ Accurately, concisely, and perspicuously report results of the history and physical examination
- ✓ Appropriately communicate with pediatric patients and their caregivers, realizing that these
- ✓ relationships change throughout childhood

Collaborator

- ✓ Work effectively with the group of individuals caring for the pediatric patient, including health care professionals and the primary caregivers
- ✓ Learn how pathology impacts the practice of pediatrics
- ✓ Determine the types of information pediatricians want to learn from an autopsy report

Leader

- ✓ Understand limitations in resources available for testing and treatment of pediatric diseases

Health Advocate

- ✓ Appropriately advocate for pediatric patients, especially in preventative medicine (e.g. immunizations, adequate nutrition, obesity)
- ✓ Understand the medicolegal aspects of infant abuse, including the importance of accurate and complete documentation and the interactions with child protection agencies and the criminal justice system

Scholar

- ✓ Perform, critically evaluate, and communicate appropriate or focused literature searches relevant to patient care
- ✓ Discuss with the health care team the pathology and pathophysiology of specific pediatric diseases

Professional

- ✓ Be punctual for shifts and educational events
- ✓ Show enthusiasm for learning
- ✓ Follow through on assigned tasks and transfer of patient care; inform supervisor of errors or concerns
- ✓ Deliver the highest quality care with integrity, honesty and compassion with sensitivity to racial, cultural and
- ✓ societal issues

PGY-1 - Emergency Medicine Objectives

Medical Expert

- ✓ Learn about the common clinical problems in the emergency ward
- ✓ Develop a systematic and cognitive approach to clinical reasoning in common cases
- ✓ Independently obtain appropriate, thorough, and directed patient medical history in common cases
- ✓ Perform appropriate, thorough, and directed physical examination in common ailments
- ✓ Understand and order appropriate, cost effective, basic laboratory tests and diagnostic images
- ✓ In consultation with attending staff, begin to independently make decisions for therapeutics in common clinical problems
- ✓ Learn how the emergency ward triages patients based on the acuity and severity of their problems
- ✓ Become competent in IV insertion, venipuncture, ABGs, simple suturing, Foley catheter insertion, urinalysis, NG tube insertion and lumbar puncture
- ✓ Assist in CPR, defibrillation, and basic airway management including intubation with close staff supervision

Communicator

- ✓ Establish and maintain rapport with patient and family, including exploring a patient's beliefs, concerns and expectations
- ✓ Inform and counsel patients about care decisions
- ✓ Maintain appropriate and concise charting
- ✓ Acquire skills in screening for abuse, sexually transmitted infections, and other sensitive issues
- ✓ Communicate effectively with other health workers both in verbal and written form

Collaborator

- ✓ Maintain collegial and respectful relationships with medical, nursing and paramedical and support staff
- ✓ Understand the roles/expertise of the other individuals involved in patient care
- ✓ Explicitly integrate the opinions of the patient and caregivers into management plans
- ✓ Perform as a team member in medical and trauma resuscitations
- ✓ Recognize when personal limits are exceeded and demonstrate timely consultation with the staff emergency physician

Health Advocate

- ✓ Assess determinants of health in the emergency ward patient; seek to intervene to promote healthy behaviors
- ✓ Assess the patient's ability to access various services in the health and social systems

Leader

- ✓ Effectively care for several patients during a shift and follows them through their ED course

Scholar

- ✓ Identify learning needs and make use of available learning resources
- ✓ Perform, critically evaluate, and communicate appropriate or focused literature searches relevant to the emergency room patient
- ✓ Discuss with the health care team the pathology and pathophysiology of specific neurological diseases that are common in the emergency room (e.g. stroke, epilepsy)

Professional

- ✓ Be punctual for shifts and educational events
- ✓ Show enthusiasm for learning
- ✓ Follow through on assigned tasks and transfer of patient care; inform supervisor of errors or concerns
- ✓ Deliver the highest quality care with integrity, honesty and compassion with sensitivity to racial, cultural and
- ✓ societal issues

RESIDENCY TRAINING IN NEUROPATHOLOGY

PGY-1 - Forensic Pathology Objectives

Note: This document pertains to first year neuropathology residents rotating on Forensic Pathology, prior to training in autopsy, neuro and forensic pathology.

Medical Expert

- ✓ Review the anatomy of the head, neck and trunk as relevant to the practice of autopsy pathology.
- ✓ Learn the spectrum of cases examined by a forensic pathologist and identify the subset of cases that undergo autopsy.
- ✓ Learn the contents of the Alberta Government Fatality Inquires Act.
- ✓ Learn the meanings of "cause" and "manner" of death and compare these with the questions addressed by hospital autopsies.
- ✓ Learn the fundamental differences between coroner and medical examiner systems.
- ✓ Observe forensic autopsies, and participate in dissections under the direct supervision of the supervising medical examiner.
- ✓ Learn the spectrum of neuropathologic findings that might be present in forensic pathology practice, from vascular pathology to infectious diseases, and trauma.
- ✓ Observe and participate in forensic neuropathology activities at the Office of the Chief Medical Examiner.

Communicator

- ✓ Understand the medico-legal importance of accuracy and completeness in death reports and the very limited role of speculation and conjecture.

Collaborator

- ✓ Work with investigators to understand the importance of the scene investigation.
- ✓ Be aware of personal limits of knowledge and seek assistance when required.

Leader

- ✓ Understand the limits of a medico-legal autopsy, including the limits of questions to be answered, time restrictions, and the use of limited resources.

Health Advocate

- ✓ Identify critical aspects of the decedent's death that could have been modified or ameliorated by changes in public policy or private behaviour.

Scholar

- ✓ Perform, critically evaluate, and communicate appropriate or focused literature searches relevant to forensic pathology.

Professional

- ✓ Adhere to the principles of patient confidentiality.
- ✓ Be punctual for activities, including rounds, conferences, and other teaching sessions.

PGY-1 – General Surgery Objectives

Medical Expert

- ✓ Learn important parameters to evaluate when assessing the surgical patient.
- ✓ Be able to diagnose and manage common acute and chronic surgical problems in the office, emergency room and hospital.
- ✓ Perform a focused examination on a surgical patient, with special emphasis on the peripheral and central nervous system.
- ✓ Understand the possible effects of general surgical conditions on the nervous system.
- ✓ Understand the possible effects that general surgical procedures may have on the nervous system.
- ✓ Participate in both major and minor interventions on surgical patients; understand the goals of these interventions and the likely outcome of these interventions.
- ✓ Understand the medical parameters relevant to general surgery, including blood loss, fluid and electrolyte imbalance, blood pressure regulation, sepsis, nutrition, etc.
- ✓ The Resident should demonstrate skills in assisting during surgical procedures and in simple suturing and wound closure.

Communicator

- ✓ Provide accurate and concise written documentation of the results of the history and physical examination in the medical record.
- ✓ Accurately and concisely communicate the relevant aspects of the clinical encounter with other members of the health care team.
- ✓ Listen effectively to divergent opinions of the health care team.
- ✓ Understand the medico-legal aspects of written documentation.
- ✓ Develop a rapport with the patient to obtain the history and background appropriate to the problem and to later advocate for changes on behalf of the patient.
- ✓ Be able to explain and justify operative procedure to patient.
- ✓ Be able to obtain informed consent for a surgical procedure.

Collaborator

- ✓ Work well and in a collegial manner with other members of the health care team in order to optimize patient care.
- ✓ Share knowledge and information about the patient's problem in such a manner as to facilitate team interaction and decision making.
- ✓ Understand personal limitations and openly seek assistance from more knowledgeable team members.

Leader

- ✓ Understand the importance of the judicious use of limited resources.
- ✓ Be able to set priorities in the care of the patient in such a manner as to procure the best outcome for the patient.
- ✓ Recognize in an emergency setting that interventions may require decisions and actions in ambiguous situations with incomplete information.

Health Advocate

- ✓ Alert appropriate authorities or health care providers of important risk factors in the patient's environment that contributed to their problem.
- ✓ Advocate on behalf of the patient for additional resources as may be required to aid them post-hospitalization.
- ✓ Be able to mobilize appropriate resources for the recuperation, continuing care and/or rehabilitation of the patient as necessary.

Scholar

- ✓ Be able to self-assess and indentify gaps in knowledge.
- ✓ Perform, critically evaluate, and communicate appropriate or focused literature searches relevant to the surgical problem at hand.
- ✓ Be able to translate this into professional competence.
- ✓ Review the pathology and pathophysiology of the surgical problem with the general surgical team, including medical students.

Professional

- ✓ Deal with patients honestly and with integrity showing compassion and caring for their situation.
- ✓ Deal with other members of the healthcare team honestly and with integrity.

- ✓ Adhere to the principles of patient confidentiality and recognize the limits or gray zones of these principles.
- ✓ Be punctual for activities involving others, including patient encounters, rounds, conferences, and other teaching sessions.

PGY-1 - Geriatrics Objectives

Medical Expert

- ✓ Learn to obtain a complete history and physical examination on a geriatric patient
- ✓ Learn how to administer and the importance of the mini-mental status examination
- ✓ Learn the importance of input from family members and other individuals in assessing a geriatric patient
- ✓ Recognize and learn therapeutic interventions for important diseases of the elderly, including: cardiovascular disease, dementia, depression, diseases that limit mobility, infections, and trauma

Communicator

- ✓ Effectively communicate with elderly patients and their caregivers
- ✓ Prepare complete, accurate, and succinct written reports from the history and physical examination

Collaborator

- ✓ Work well with the team caring for the geriatric patient

Leader

- ✓ Understand the limits of reasonable interventions in the elderly, including the unintended sequelae of procedures
- ✓ Determine cost-effective solutions for patients on limited budgets

Health Advocate

- ✓ When appropriate, advocate for more aggressive therapies or interventions
- ✓ Recognize the importance of depression in the elderly and seek appropriate therapies

Scholar

- ✓ Perform, critically evaluate, and communicate appropriate or focused literature searches relevant to patient care
- ✓ Discuss with the health care team the pathology and pathophysiology of specific diseases (e.g. dementias, stroke, incontinence)

Professional

- ✓ Adhere to the principles of patient confidentiality
- ✓ Be punctual for activities involving others, including rounds, conferences, and other teaching sessions
- ✓ Be respectful of elderly patients and their caregivers

PGY-1 – Neurology Objectives

Medical Expert

- ✓ Learn to obtain an accurate patient neurologic history and realize its importance in diagnosing neurological diseases Accurately perform a neurological examination on a patient, to both determine the location of the disease and to assess the patient's disability
- ✓ Accurately examine all cranial nerves
- ✓ Examine the peripheral nervous system (sensory and motor components)
- ✓ Examine the pattern of muscle weakness
- ✓ Develop relevant differential diagnoses that relate to the history, examination, and localization and suggest appropriate tests to further evaluate the patient
- ✓ Describe different treatment modalities (medical intervention, surgical intervention) for specific neurological diseases (e.g. anticoagulants in stroke, anti-epileptics, cholinergic agonists in dementia)

Communicator

- ✓ Adequately explain to patients the purpose of the neurological examination and what
- ✓ they might expect
- ✓ Accurately, succinctly, and perspicuously document the patient history and physical
- ✓ examination
- ✓ Discuss the results with patients and/or their families, in a manner appropriate for their backgrounds and with empathy and compassion

Collaborator

- ✓ Work well with other members of the neurology team
- ✓ When in doubt, seek advice from other members of the neurology team

Leader

- ✓ Recognize the limits of available resources when ordering tests
- ✓ Appropriate triage testing, to optimally utilize limited resources

Health Advocate

- ✓ Respond to an individual patient's needs by pursuing testing, gathering test results, discussing results with patients and their families, and advocating for the treatment appropriate specific to that patient

Scholar

- ✓ Perform, evaluate, and communicate appropriate or focused literature searches
- ✓ relevant to patient care
- ✓ Discuss with the health care team the pathology and pathophysiology of specific
- ✓ diseases (e.g. multiple sclerosis, movement disorders, dementias, stroke, epilepsy,
- ✓ neuromuscular diseases)
- ✓ Discuss the appropriateness or inappropriateness of pathology in the evaluation of a neurologic patient, including muscle, nerve, and brain biopsies

Professional

- ✓ Adhere to the principles of patient confidentiality and recognize the limits or gray zones of these principles
- ✓ Be punctual for activities involving others, including rounds, conferences, and other teaching sessions

PGY-1 - Neuro-oncology/Clinics Objectives

Medical Expert

- ✓ Describe a specific example of a clinical trial, including the funding sources, application process, selection criteria (including pathological criteria), outcome measures, and how the results are analyzed.
- ✓ Evaluate a brain tumor patient and be able to obtain the information necessary (history, physical examination) for their therapy.
- ✓ Describe the Karnofsky score and apply this to individual patients.
- ✓ Describe the strengths and limitations of different treatment modalities (surgery, radiation therapy, and chemotherapy).
- ✓ From knowledge of current therapies for intrinsic brain tumors, plus knowledge of a specific patient, suggest the appropriate therapies for that patient.
- ✓ Identify the role, importance, and limitation of pathology in the overall treatment schema for patients with brain tumors.

Communicator

- ✓ Communicate effectively with patients, including obtaining a relevant and succinct history.
- ✓ Discuss with patients their treatment options, possible complications, and the prognosis following such treatments.

Collaborator

- ✓ Work effectively with the members of the neurooncology team, including nurses, surgeons, oncologists, and radiation therapists.

Leader

- ✓ Describe the limits of available resources; especially, describe the limits of provincial funding for expensive or experimental therapies.
- ✓ When limitations arise, suggest alternate methods of obtaining funding or alternative but funded therapies.

Health Advocate

- ✓ Integrate pathology reports, radiology findings (including the neuroanatomic location of a tumor), and the clinical status of the patient to advocate for the appropriate therapy for individual patients.
- ✓ Navigate the medical system to provide the appropriate and optimal care for patients.

Scholar

- ✓ In select instances, present scholarly articles from the recent literature to the health care team. These publications should be pertinent to an individual patient's care and should be critically evaluated.

Professional

- ✓ Maintain a professional approach to individual patients; treat patients with respect and discuss their situation with the health care team with compassion, respect, and confidentiality.
- ✓ Maintain professional interactions with the many medical personnel involved in the care of brain tumor patients.

PGY-1 – Neuro-radiology Objectives

Medical Expert

- ✓ Learn basic principles of planar radiology, including the basic physics of X-ray scatter and the development of contrast
- ✓ Learn the basic principles of computed tomography (CT)
- ✓ Learn the basic principles of magnetic resonance imaging (MRI), including some simplified physics behind signal generation, contrast, pulse sequences, and the generation of images
- ✓ Identify anatomic structures in CT and MRI images
- ✓ Identify the major effects of pathology on neuroimaging (e.g. edema, restricted diffusion, enhancement, mass effects)
- ✓ Use neuroanatomical knowledge plus information about pathology to diagnose or list possible diagnoses for major neurological diseases, including neoplasia, infarction, demyelination, infections, hemorrhages, and trauma

Communicator

- ✓ Explain to patients what they might expect to happen during imaging procedures
- ✓ When appropriate, prepare succinct written reports
- ✓ Research clinical information and provide that information in a succinct form when reviewing patient radiology

Collaborator

- ✓ In conjunction with other specialties, work with radiologists to prepare accurate and correlative radiology reports

Leader

- ✓ Learn the extensive infrastructure and personnel required to operate CT and MRI scanner, including the costs involved in acquiring and maintaining these instruments
- ✓ Learn the triage system used by neuroradiology to provide clinical service with this limited resource.

Health Advocate

- ✓ When appropriate, advocate for specific patients to receive additional or more timely radiological testing

Scholar

- ✓ Perform, evaluate, and communicate appropriate or focused literature searches relevant to neuroimaging, especially relating neuroradiology to the underlying neuropathology
- ✓ Discuss with neuroradiologists the pathology and pathophysiology of specific diseases and how these might affect neuroimaging studies

Professional

- ✓ Be punctual to rounds, teaching sessions, and other meetings
- ✓ Preview cases prior to sign-out or didactic sessions and prepare preliminary observations
- ✓ Maintain a professional attitude toward staff, assistants, and patients

PGY-1 - Neurosurgery Objectives

Medical Expert

- ✓ Learn to obtain a complete, accurate and well-organized history and physical examinations
- ✓ Develop appropriate differential diagnoses, based on a patient's history and physical examination
- ✓ Learn appropriate laboratory tests and their interpretation
- ✓ Learn the Glasgow coma scale and its meaning for patient outcomes
- ✓ Learn salient aspects of the anatomy of the skull and spine, including the coverings of the nervous system, which enable opening and closure of surgical incisions
- ✓ Learn sufficient neuroanatomy to be able to localize common lesions of the central and peripheral nervous systems
- ✓ Learn the major vascular anatomy of the nervous system, including venous drainage, especially how these relate to neurosurgery
- ✓ Understand the normal physiology of nerve, muscle, cerebral circulation, CSF circulation, and special senses
- ✓ Learn the clinical effects of common pathological processes, including mass lesions, head injury, infection, cerebral edema and ischemia, raised ICP, subarachnoid haemorrhage, seizures, hydrocephalus, spinal cord or nerve root compression, and peripheral nerve entrapment
- ✓ Understand the relative importance of neuropathology in different neurosurgical procedures (e.g. importance in stereotactic biopsies and tumor resections versus carotid endarterectomy and drainage of a subdural hematoma)
- ✓ Demonstrate the ability to successfully carry out the following procedures:
  - Lumbar puncture
- ✓ Observe or participate in the following procedures:
  - Insertion of external ventricular drain
  - Application of a halo ring
  - Application of a stereotactic frame and performance of a stereotactic biopsy
  - Resection of a brain tumor
  - Trauma neurosurgery, including head trauma and spine trauma
  - Pituitary surgery
- ✓ When appropriate and within personal skills, triage, resuscitate and provide early treatment for a patient with injury to the head and spine

Communicator

- ✓ Provide clear, concise, and accurate patient histories, physical examinations, and progress; give coherent and precise verbal presentations
- ✓ Be an effective listener
- ✓ Effectively consult other medical specialists and other health care providers, as well as community and social service agencies
- ✓ Communicate clearly with patients and families, answering all questions appropriately, and avoiding the use of confusing medical jargon
- ✓ Dictate consultation letters that provide accurate descriptions and assessments of patient medical problems, discuss diagnosis, and outline treatments plans and goals

Collaborator

- ✓ Work well with colleagues, nurses, RT and other allied health care professionals and collaborate with laboratory staff and physicians to optimize patient care
- ✓ Learn from neurosurgeons aspects of pathology that are important to their work, including the use of frozen sections and the content of a surgical pathology report

Leader

- ✓ Manage time effectively and prioritize when faced with multiple tasks
- ✓ Understand the rationale for common laboratory and imaging studies and demonstrate appropriate cost-effective use

Health Advocate

- ✓ Learn important determinants of health and their impact on neurosurgical patients
- ✓ Educate patients and families about their condition and management of risks

- ✓ Facilitate access to community resources, when needed

Scholar

- ✓ Perform, evaluate, and communicate appropriate or focused literature searches relevant to patient care; bring new or relevant information to the health care team
- ✓ Discuss with clinical clerks, colleagues and allied care providers the pathology and pathophysiology of specific diseases

Professional

- ✓ Be punctual at attending rounds, clinics and the operating room
- ✓ Demonstrate compassion and understanding; be aware of the psychological, social, ethical, cultural and economic impact of the clinical and health care system decisions concerning patients
- ✓ Recognize personal limitations as a doctor; when appropriate, seek assistance from others and respond to constructive criticism in a positive manner
- ✓ Take appropriate responsibility for patient management
- ✓ Be reliable, conscientious and committed to personal excellence; aim for the highest professional ethical standards

PGY-1 - Neonatal Intensive Care Unit (NICU) Objectives

Medical Expert

- ✓ Learn how to thoroughly examine the preterm and term infant and understand what information is important, including gestational assessment
- ✓ Learn what information is important in the prenatal history of an infant and how to obtain that information
- ✓ Use all pertinent information to generate appropriate differential diagnoses, suggest appropriate testing, and interpret all findings to determine an accurate diagnosis.
- ✓ Participate in resuscitation efforts efficiently and confidently
- ✓ Understand major problems of prematurity, including hypoxic-ischemic injury, germinal matrix hemorrhages, periventricular leukomalacia, pulmonary immaturity, hyperbilirubinemia, and infections
- ✓ Understand major problems of full-term infants in the NICU, including cardiac malformations, metabolic abnormalities, and hypoxic-ischemic injury, as well as relevant interventions
- ✓ Assess the nervous system of newborns in the NICU
- ✓ Understand the physical principles behind technologies; learn their appropriate use, risks, and their long-term consequences

Communicator

- ✓ Prepare accurate and comprehensive written histories and physical examinations and be able to present this information in an abbreviated oral report
- ✓ Communicate effectively with families, including discussions about diagnoses, investigations, therapeutics, and prognosis, in a clear and empathetic manner
- ✓ Offer empathetic support to parents, families and members of the healthcare team, especially in times of stress
- ✓ Demonstrate sensitivity and respect for diversity, including different cultural and religious beliefs.

Collaborator

- ✓ Interact effectively and constructively with all members of the health care team, recognizing and acknowledging their roles and expertise
- ✓ Develop patient care plans in a collaborative fashion
- ✓ Discuss with neonatologists what information they would like to know when obtaining an autopsy on a NICU patient

Leader

- ✓ Learn some of the costs involved in the neonatal intensive care unit, including the average per-day cost of an infant

Health Advocate

- ✓ Ensure adequate follow-up medical and support service care for infants at discharge, including discharge planning with the primary care physician, Perinatal Follow-up Program, Social Services and other community services to ensure optimal ongoing care
- ✓ Learn policies that promote health in infants such as breast-feeding, cessation of smoking, SIDS prevention, immunization, strategies against infectious diseases, and parent-infant bonding

Scholar

- ✓ Perform, critically evaluate, and communicate appropriate or focused literature searches relevant to patient care
- ✓ Discuss with and teach other members of the health care team about the pathology and pathophysiology of fetal and infant diseases
- ✓ Discuss with the health care team the pathology and pathophysiology of specific diseases of the fetus and infant

Professional

- ✓ Remain calm in emergency situations; acts in a timely manner and prioritizes appropriately
- ✓ Recognize your own limitations and seeks feedback, accept feedback in a mature manner
- ✓ Fulfills medical, legal and professional obligations of the neonatal-perinatal specialist, including application of legislation and regulations relevant to the care of the newborn (e.g. newborn screening)
- ✓ Display professional attitudes and behaviours essential in the practice of neonatal-perinatal medicine
- ✓ Display compassionate interest and understanding of the fetus and the newborn
- ✓ Be reliable, punctual, and conscientious in the care for the neonate and their family
- ✓ Understand the complex ethical issues in perinatal and neonatal care and apply these in clinic situations

PGY-1 – Otolaryngology (ENT) Objectives

Medical Expert

- ✓ Obtain a complete and concise clinical history
- ✓ Perform a physical examination focused on otolaryngology
- ✓ Perform a complete examination of the cranial nerves, including olfactory, vestibular and auditory systems
- ✓ Learn the anatomy of the sinuses and skull base, including their relationship to the central and peripheral nervous system
- ✓ Learn the pathophysiology of swallowing disorders
- ✓ Understand the transsphenoidal approach to the pituitary
- ✓ Acquire surgical skills appropriate for level of training

Communicator

- ✓ Establish therapeutic relationships and communicate effectively with patients and their families
- ✓ Prepare clear and succinct written reports of the history and physical examination
- ✓ Communicate effectively with health care team

Collaborator

- ✓ Consult effectively with other physicians and health care professionals
- ✓ Understand the use of pathology by otolaryngology and the interactions between these two specialties

Leader

- ✓ Utilize resources effectively to balance patient care and learning needs
- ✓ Utilize information technology to optimize patient care and education

Health Advocate

- ✓ Identify and seek to modify the determinants of health affecting otolaryngology patients (e.g. smoking cessation)
- ✓ Advocate on behalf of patients for appropriate treatments and social care

Scholar

- ✓ Perform, critically evaluate, and communicate appropriate or focused literature searches relevant to patient care
- ✓ Discuss with the health care team the pathology and pathophysiology of specific diseases related to otolaryngology, especially involving neuropathology

Professional

- ✓ Be punctual to rounds, teaching sessions, and other meetings
- ✓ Preview case information and examine pertinent literature prior to reviewing them with staff
- ✓ Maintain a professional attitude toward staff, assistants, and patients
- ✓ Exhibit appropriate personal and interpersonal professional behaviours
- ✓ Appreciate personal limitations and seek appropriate assistance

PGY-1 - Paediatric Neurology Objectives

Medical Expert

- ✓ Learn important neurological development milestones and their underlying physiology
- ✓ Learn how neuroimaging changes in premature infants, infants, children, and adults, and learn some of the reasons for those changes
- ✓ Learn the anatomy, physiology, and pathophysiology of their pediatric patients with neurological diseases
- ✓ Relate the development of the nervous system to the diseases that are unique or common in pediatric neurology
- ✓ Learn common pharmacologic, surgical, or other therapeutics appropriate for their patients
- ✓ Learn how to obtain a neurological history in pediatric patients, including using information from parents or caregivers
- ✓ Develop skill in the neurological examination of infants, children, and teenagers; appreciate how such examinations differ from neurological examination in adults
- ✓ Use information from the history and physical examination to generate differential diagnoses; prioritize these and suggest appropriate tests to narrow the diagnosis
- ✓ Interpret relevant laboratory tests and diagnostic imaging

Communicator

- ✓ Discuss relevant information with patients or their caregivers at a level they can understand, without use of medical jargon
- ✓ Present clinical data in an organized, problem-oriented manner
- ✓ Discuss relevant information with health care professionals
- ✓ Produce accurate, timely and appropriately written or dictated documentation
- ✓ Produce well organized reports that provide clear directions to other practitioners

Collaborator

- ✓ Understand personal limitations; seek help when required; be receptive to constructive criticism and feedback
- ✓ Function collaboratively in a multidisciplinary team
- ✓ Follow up on outstanding issues with other practitioners in a timely fashion
- ✓ Understand the role of neuropathology in pediatric neurology; determine information from an autopsy that would be useful to a pediatric neurologist
- ✓ Learn the criteria and thresholds used by pediatric physicians in obtaining a muscle biopsy; understand the questions to be addressed by such biopsies

Leader

- ✓ Manage and utilize resources effectively where appropriate (e.g., evaluate the need for and appropriately order laboratory tests or diagnostic imaging)
- ✓ Display appropriate time management skills; prioritizes tasks and perform procedural interventions in a timely and efficient manner

Health Advocate

- ✓ Identify important determinants of health affecting patients (e.g. poverty, socio-economic status, culture issues)
- ✓ Recognize opportunities for health promotion and disease prevention (e.g. recommending immunization)
- ✓ Be sensitive to societal factors (e.g., gender, cultural issues)
- ✓ Learn the important medicolegal aspects of infant abusive head injury, including the documentation and reporting of abuse to appropriate governmental agencies

Scholar

- ✓ Perform, critically evaluate, and effectively communicate appropriate or focused literature searches relevant to patient care; bring new or relevant information to the health care team
- ✓ Discuss with clinical clerks and other on the health care team the pathology and
- ✓ pathophysiology of patient-related pediatric neurologic disease, using effective teaching strategies

Professional

- ✓ Prepare for rounds by reading around cases
- ✓ Be courteous and respectful to patients, their families, team members and staff

- ✓ Actively listen to and be cognizant of the needs and expectations of patients and families
- ✓ Be empathic for sick patients and their families and deliver quality care with integrity, honesty, and compassion
- ✓ Remain dedicated, enthusiastic, responsible, and punctual

PGY-1 - General Surgery Trauma Objectives

Medical Expert

- ✓ Learn important parameters to evaluate when assessing the traumatized patient
- ✓ Obtain a rapid, concise, focused history related to the trauma
- ✓ Perform a focused examination on a trauma patient, with special emphasis on the peripheral and central nervous system
- ✓ Be able to determine a trauma patient's Glasgow coma score
- ✓ Understand the effects of trauma on the nervous system, including traumatic brain injury, coup versus contrecoup contusions, diffuse axonal injury, and spine-spinal cord trauma
- ✓ Participate in both major and minor interventions on trauma patients; understand the goals of these interventions and the likely outcome from the procedures
- ✓ Understand the medical parameters relevant to trauma, including blood loss, fluid volume, and blood pressure regulation

Communicator

- ✓ Accurately and concisely document the results of the history and physical examination in the medical record
- ✓ Understand the medicolegal aspects of written documentation
- ✓ Develop a rapport with the patient to obtain the history and background prior to the trauma, to later advocate for changes on behalf of the patient

Collaborator

- ✓ Work well and in a collegial manner with other members of the health care team
- ✓ Understand personal limitations and openly seek assistance from more knowledgeable staff

Leader

- ✓ Understand the importance of the judicious use of limited resources
- ✓ Recognize in an emergency setting that interventions require decisions and actions in ambiguous situations with incomplete information

Health Advocate

- ✓ Understand the role of the criminal justice system in select types of trauma Intervene on behalf of a patient whose trauma has been inflicted by another person
- ✓ Alert appropriate authorities or health care providers of important risk factors in the patient's environment that contributed to their trauma

Scholar

- ✓ Perform, critically evaluate, and communicate appropriate or focused literature searches relevant to the trauma patient
- ✓ Review the pathology and pathophysiology of nervous system trauma with the trauma team, including medical students

Professional

- ✓ Adhere to the principles of patient confidentiality and recognize the limits or gray zones of these principles
- ✓ Be punctual for activities involving others, including rounds, conferences, and other teaching sessions

PGY-2: ANATOMIC PATHOLOGY

5 blocks Surgical Pathology (FMC/SHC/RGH) + 4 blocks (Adult) Autopsy (FMC) + 1 block Cytology (DSC) + 2 blocks Paediatric Pathology (ACH) + 1 block Forensic Pathology (OCME)

PGY-2 Surgical Pathology

General Objectives:
During the course of the training program, the resident will develop the knowledge and skills necessary to function as a surgical pathologist. The resident will acquire a broad and deep knowledge of surgical pathology as an academic and practical subject with a sense of how surgical pathology relates to the patient, his problems and their treatment. The resident will also acquire a thorough knowledge of all the procedures performed in the surgical pathology laboratory, from the proper fixation and submission of specimens to the lab, to gross dissection, to the preparation slides and other diagnostic material, to the production and distribution of complete and accurate medical reports and finally the maintenance and operation of Quality Assurance and Quality control programs

Specific Objectives:

Medical Expert:

1) Demonstrate the ability to accurately describe and sample gross pathology specimens.

a) Describe the gross findings orally
b) Describe the gross findings in writing.
c) Appropriately cut and sample surgical specimens depending on the clinical, radiological, laboratory and other data obtained.
d) Be proficient in the making of smears and touch preparations
e) Be proficient in the embedding of fresh tissue and the cutting and staining of frozen sections
f) Appropriately sample surgical specimens for rush diagnosis
g) Effectively communicate the rush diagnosis to the operating surgeon
h) Apply universal precautions for dealing with surgical specimens and special precautions when dealing with established or suspected infectious etiologies.
i) Be proficient with the principles and techniques of harvesting tissue for electron microscopy, cytogenetics, molecular biology, flow cytometry and research protocols.

2) Demonstrate adequate knowledge and understanding of the methods of tissue fixation and processing in surgical pathology.

a) Know the principles of fixation, the types of fixatives used and their indications in the practice of surgical pathology, for both light and electron microscopy.
b) Know the principles of tissue processing including, dehydration, paraffin embedding, paraffin sectioning, osmication and plastic embedding.

3) Demonstrate knowledge of the principles of histology staining and the use of these stains in the surgical pathology examination of diseases. For this the resident will be able to:

a) Understand the basis of the routine stains and special stains used in surgical pathology
b) Understand the basis of immunohistochemical and immunofluorescence staining techniques.

c) Understand the utility of special staining techniques (immunohistochemical and immunofluorescence)
d) Understand the basis of molecular biology procedures.
e) Understand the utility of molecular biological procedures used in surgical pathology
f) Select the appropriate immunohistochemical stains and molecular biological procedures relevant to the problem based on the gross, histologic, clinical, radiologic, laboratory and other data available.
g) Interpret the normal, abnormal and artifactual findings demonstrated by each of these stains in tissue sections.
h) Interpret the normal, abnormal and artifactual findings demonstrated by use of molecular biological procedures in tissue specimens.
i) Understands the basis of morphometry.
j) Be familiar with the principles of tissue culture, karyotype preparation, chromosome banding and interface nuclear sexing techniques which are employed in cytogenetic investigations.

4) Demonstrate the ability to adequately describe and record microscopic findings.

a) Operate and maintain a light microscope, and apply polarized optics and immunofluorescent techniques
b) Adequately describe microscopic findings orally
c) Adequately describe microscopic findings in the surgical pathology report.
d) Take photomicrographs

5) Demonstrate an ability to produce a surgical pathology report with an interpretation appropriate to the clinical setting.

a) Accurately and succinctly describe the gross and microscopic findings
b) Correlate these findings with the known clinical, radiological, laboratory and other data.
c) Provide pathologic diagnosis
d) Discuss the pathophysiology of the disease process as it applies to that particular patient.
e) Recommend any further investigations that may be helpful, based on the biopsy findings

6) Access and apply relevant information to the practice of Anatomical Pathology.

a) Demonstrate a thorough knowledge of the normal organs of the body. The resident should be able to:

i) Have a superior knowledge of normal gross anatomy of the body.
ii) Have a superior knowledge of the histology of the body organs
iii) Have a superior knowledge of the physiology of the individual body organs.

b) Demonstrate a thorough knowledge of (including molecular genetics, molecular biology, etiology, pathophysiology, gross and microscopic pathology, and clinical pathology correlations) general pathologic reactions of the organs of the body (general pathology). For this, the resident will acquire a superior knowledge of:

i) Mechanisms of cellular injury and repair.
ii) Mechanisms of inflammation
iii) Disorders of immunity and immune mediated diseases.
iv) Disorders of genetics and the molecular basis of cell function and dysfunction
v) Mechanisms of the process of neoplasia.
vi) Nutritional and metabolic disorders.
vii) The influences of environmental and toxic factors on the body.
viii) Infectious diseases (bacterial, fungal, viral, rickettsial and parasitic) and their effects on the body.

ix) Disorders affecting the fetus, infant, and child, including a thorough knowledge of embryological development and its relationship to malformations, and the molecular biology and genetics associated with malformations.

x) How specific derangement's, focal or general, in tissue structure and/or function leads to specific clinical, physiologic, and radiological and laboratory abnormalities.

7) Demonstrate a superior knowledge of the pathology and pathophysiology (including molecular genetics, molecular biology, etiology, pathophysiology, gross and microscopic pathology, and clinical pathological correlation's) of disorders of the organs systems (systemic pathology).

a) Disorders affecting the heart and blood vessels.
b) Disorders affecting the hematopoietic system, lymph nodes and the mechanisms of coagulation, thrombosis and fibrinolysis.
c) Disorders affecting the respiratory system.
d) Disorders affecting the head and neck
e) Disorders affecting gastrointestinal tract, liver, biliary tract and pancreas.
f) Disorders affecting kidneys and genitourinary tract
g) Disorders affecting breast
h) Disorders affecting endocrine system
i) Disorders affecting integument
j) Disorders affecting skeletal system and connective tissues
k) Disorders affecting nervous system

Communicator:

1) Residents will demonstrate an ability to establish a relationship of trust and respect with clinical and non-clinical colleagues, patients, their family, and the community.

2) Communicate effectively with technical and clinical colleagues informally, through formal verbal presentations (presentation at rounds, meetings), and in the form of surgical pathology reports.

3) Demonstrate ability to answer questions on etiology, pathogenesis, and pathology of disease without preparation and be able to openly admit circumscribed ignorance without loss of face.

4) Obtain and synthesize information from clinical and other colleagues and listen carefully.

5) Discuss information freely with clinicians and, if necessary, patients and their families.

a) Communicate effectively (verbally and in writing) the results of pathology investigations in a timely fashion to colleagues, so that patient care is not delayed or jeopardized.
b) Be willing to discuss results with family, as they become available and provide a time-line for the final diagnosis.
c) Assist in the continuing education of physicians and other members of the hospital staff by participating effectively in interdisciplinary rounds and meetings (including presentation at rounds).

Collaborator:

1) The resident will become part of the clinical team through interaction with clinical colleagues directly and at rounds.

2) Demonstrate the ability to advise clinical colleagues on the appropriateness of obtaining histology specimens and follow up examinations of these, and to advise on further appropriate investigations.

3) Understand the role of intra- and extra-departmental review of diagnostic material

4) Contribute effectively to other interdisciplinary team activities
   a) recognize the expertise of other health team members
   b) respect the role and opinions of other health team members
   c) Understand the principles of tissue acquisition for research.

Leader:

1) Effectively utilize information technology to optimize patient care, as well as to facilitate continual self-learning

   a) Use a word processing program
   b) Use patient related clinical and laboratory database programs.
   c) Use graphics and presentation programs.
   d) Be familiar with the application of computers in laboratory medicine in general and anatomic pathology in particular.
   e) Be an effective time manager
   f) Plan self-learning and self-assessment learning goals and objectives.
   g) Maintain a Continuing Medical Education (CME) log book of the rounds, lectures and other CME activities they have attended.

2) Demonstrate an ability to run a quality control program in surgical pathology. For this the resident should be able to:

   a) Run a conference with colleagues in the discussion of routine, interesting, and difficult cases.
   b) Be familiar with quality control programs for tissue processing and staining.
   c) Be familiar with quality control for frozen section diagnosis – final diagnosis comparison for surgical pathology specimens.
   d) Understand mechanisms used to ensure accurate and rapid preparation and distribution of all surgical pathology reports
   e) Understand methods of effective indexing and storage of specimens and reports and methods for efficient data retrieval.
   f) Understand the legal obligations for tissue paraffin block and glass slide storage.
   g) Understand the financing of the anatomical pathology laboratory and how to set about acquiring additional funding or achieving improved economy.

3) Work effectively and efficiently in a health care organization. For this the resident will:

   a) understand the roles and responsibilities of a surgical pathologist
   b) understand principles of laboratory management and administration
   c) understand methods of quality control and quality assurance in surgical pathology
   d) understand the organization and function of the Canadian health care system
   e) understand the principles of workload measurement within the laboratory
   f) demonstrate a knowledge of laboratory safety
   g) Understand finite health care resources and use discretion in utilization of resources without unnecessary waste.
   h) Utilize time and resources effectively to balance patient care, learning needs and outside activities.

Health Advocate

The resident will be competent to:
1) Recognize and respond to those issues, circumstances, or situations in which advocacy on behalf of patients or community is appropriate. The resident will be competent to:

a) Identify population at risk for specific disease entities
b) Recognize the fundamental role of epidemiological research in understanding the pathophysiology and etiology of disorders.
c) Understand the importance of promoting and reinforcing to the public and profession the essential contribution of laboratory medicine in health.
d) Demonstrate the ability to recognize those situations, especially regarding infectious or communicable diseases, that require consultation or notification of the Department of Health.
e) Understand procedures for disposal of chemical and biological waste.
f) Demonstrate understanding and compliance with safety guidelines of the laboratory. They should have a thorough grasp of measures taken to avoid biohazards in the laboratory and to avoid chemical spills.
g) Understand how public policy is developed with regard to health and disease.

Scholar:

The resident will be able to:
1. Develop, implement and document a personal continuing education strategy. The resident will

a) Accept the responsibility for self-learning and self-evaluation
b) Demonstrate the ability to identify gaps in knowledge and expertise.
c) Access personal learning needs
d) Choose an appropriate learning method and subject matter(s)
e) Evaluate the outcome of the self-learning experience.

2. Apply the principles of critical appraisal to sources of medical information. For this the resident will:

a) Incorporate an attitude of scientific inquiry and the use of evidence into the process of making pathologic diagnoses.
b) Select appropriate questions to be answered.
c) Research the literature for answering the questions.
d) Keep current with evidence based literature pertinent to the practice of surgical pathology. .

3. Facilitate the learning of patients, students, residents and other health professionals. For this the resident will:

a) Demonstrate an ability to utilize surgical cases for teaching of undergraduates, residents and clinical colleagues
b) Assist in continuing medical education of physicians and other members of the hospital staff.
c) Demonstrate skills in taking photographs of gross specimens as well as microphotographs for the purpose of teaching and communication
d) Teach pathological principles at rounds, conferences and other forums.

4. Contribute to the development of new knowledge. For this the resident will:

a) Demonstrate the ability to pose a research question, to formulate a plan that attempts to answer the question, and to carry out the research according to program requirements.
b) Conduct a literature search relevant to the question
c) Identify, consult and collaborate with the experts with the expertise in the area of the research.
d) Propose a methodological approach to answer the question.
e) Carry out the research proposal
f) Defend and disseminate the results of the research
g) Identify areas for further research which arise from the results
h) Acquire skills in the development of guidelines relevant to the practice of surgical pathology

Professional:

1. Deliver the highest quality practice of surgical pathology with integrity, honesty and compassion. The resident will be competent to:

a) Demonstrate effective consultation, as an anatomical pathologist, with respect to patient care, education and legal opinion.
b) Recognize personal limits of expertise. The resident must be able to:
1) Recognize when he/she should seek consultation from another pathologist.
2) Recognize when he/she should seek consultation from a specialist other than a pathologist.

2. Exhibit appropriate personal and interpersonal behaviors. For this the resident will:
a) Demonstrate appropriate interpersonal relationships with peers, supervisors, support and clinical staff, showing concern, respect for others, and sensitivity to gender/ethnic and other social issues
b) Respond appropriately to criticism
c) Act as an appropriate role model for students and others.
d) Address interpersonal differences in professional relations.
e) Maintain an appropriate balance between personal and professional roles
f) Be accountable for his/her personal actions
g) Have a high degree of self-awareness
h) Be reliable and conscientious in the discharge of his/her professional responsibilities.

3. Practice surgical pathology in an ethically responsible manner that respects the medical, legal and professional obligations of belonging to a self-regulating body. The resident will:

a) Demonstrate an ethical approach to the performance of duties within the laboratory
b) Know and understand the professional, legal and ethical codes to which physicians are bound
c) Understand and apply relevant legislation relating to the health care system in order to guide him/her in the practice of surgical pathology.
d) Recognize, analyze and know how to deal with unprofessional behaviour in the practice of medicine, including but not exclusive to health problems such as psychiatric illness or substance abuse, taking into account local and provincial regulations.

The resident will fulfill these objectives by:

1) Integrating into a busy tertiary care surgical pathology service to obtain intensive hands-on experience.
2) Assume graded responsibility commensurate with experience and seniority. (see appendix for further details)
3) In depth and systematic study of surgical pathology through participation in education as well as patient-service oriented rounds.
4) Regular attendance at academic half-day and specialty rounds
5) Diligent preparation of cases prior to signing them out with a staff pathologist on a doubled-headed microscope.
6) Attending the didactic teaching program that cover core knowledge of pathology and Can Meds competencies as pertaining to surgical pathology
7) Participation in continuing Medical Education sessions.
8) Participation in resident research day starting in PGY2
9) Participation in teaching medical students, junior residents, technical staff, etc.
10) Regular assessment of their performance at rounds and sign-out sessions with staff pathologist
11) Biannual formal evaluation examinations
12) Using current journals and surgical pathology texts as well as Internet resources.
13) Obtaining experience in laboratory organization and quality assurance.
14) Applying safety principles with regard to hazards associated with the laboratory.
15) Discussion of ethical problems related to the practice of pathology with peers and teaching staff.

PGY-2 Adult Autopsy (FMC)

General Objectives

The primary objective of this component of the program is to train residents to conduct a high quality, problem-oriented autopsy. The training has a graduated level of responsibility. At the end of training the resident should be able to conduct a comprehensive autopsy, prepare a well-written report on the findings, demonstrate the findings to a medical audience, and correlate these findings with the clinical features of the case. The resident pathologist should be familiar with the medico-legal aspects of the autopsy including matters concerning the legality of consent and requirements for medico-legal autopsies.

The resident should have demonstrated due concern and relevant knowledge regarding infectious hazards associated with the autopsy. The resident should have demonstrated technical skills in all areas of routine autopsies as well as be able to carry out specialist autopsy techniques that may be orientated towards specific organ systems, or certain types of clinical cases (for example, pediatric, forensic, cardiac and neuropathology cases). The residents should be able to prepare/dissect and photograph appropriate gross autopsy specimens with a view for presentation at clinicopathological case rounds (CPC rounds). The resident must be able to act as consultant to clinical colleagues on interpretation of the autopsy findings and their relevance to the clinical setting.

Specific Objectives

Medical Expert

1) Residents must have detailed knowledge of the legal requirements pertaining to valid informed autopsy consent, safety training requirements and of the regulations relating to retention of autopsy tissue specimens for research and teaching.
2) Residents must have detailed knowledge of the responsibilities and relationships of the medical examiner, police and the hospital pathologist including: legal requirements for classifying a death as a medical examiner case, reporting of findings to the medical examiner, reporting cases to public health officials with respect to notifiable infectious disease and the legal requirements of Alberta Workers Compensation Programs.
3) Residents must demonstrate that they can conduct an autopsy and ancillary autopsy procedures with maximum safety to themselves and others. Residents should be familiar with classifications of infectious disease as they pertain to health regulations and with the modes and vectors of transmission of infectious agents during autopsy procedures

4) Residents must be able to extract relevant information from the clinical chart and electronic databases of CLS and Calgary Health Region and consult with attending physicians if necessary. They must be able to summarize this information orally and in writing and use this information appropriately to plan the autopsy.
5) Residents must demonstrate an ability to perform a full autopsy in a systematic manner. Initially they must be proficient in en-bloc organ removal and dissection (Rokitansky technique). By completion of their training they must demonstrate skills in organ system removal (Virchow technique).
6) Conduct appropriate dissections of organ systems tailored to specific clinical questions and/or autopsy limitations. Prepare dissections in suitable form for subsequent demonstration and preparation of permanent teaching specimens for undergraduate medical students.
7) Take organ, blood and body fluid and/or culture when appropriate.
8) Demonstrate an ability to identify, describe and document diseased organs and tissues. Cut and block samples in a manner that is appropriate to the clinical, radiological, laboratory and other data.
9) Describe in writing the gross findings of specimens.
10) Photograph gross specimens.
11) Interpret microscopic slides with the help of your attending and identify and diagnose pathologic and post mortem autolytic changes.

12) Recognize morphological changes induced by conventional and novel modes of therapy including new surgical techniques, chemotherapy, radiotherapy, and adverse drug reactions.

Communicator

1) Demonstrate an ability to produce an autopsy report with an interpretation appropriate to the clinical setting. For this he/she should be able to:
2) Provide pathologic diagnoses.
3) Correlate these findings with the known clinical, radiological, laboratory and other data.
4) Discuss the pathophysiology of the disease process in the patient being reviewed.
5) Generate an autopsy report, which includes accurate patient demographics, clinical information, gross description, microscopic description, diagnosis, and a summary of the most relevant summary interpreting the findings and making clinical-pathologic correlations.
6) Synthesize all the available clinical and pathologic information to formulate a meaningful differential diagnosis regarding the patient's clinical progress and cause of death.
7) Effectively communicate the pathologic findings and conclusions to professional colleagues in pathology as well as attending physicians and surgeons (and families of the deceased, when appropriate).
8) Recognize deficiencies and take appropriate corrective action.
9) Residents will also present select cases at Friday rounds and Tuesday CPC rounds.
10) Residents are expected to meet professional deadlines in a timely manner (e.g. provisional diagnoses should be signed out in 48 hours; final diagnosis in 60 working days)

Collaborator

1) The resident must demonstrate a commitment to medical ethics, sensitivity to diverse patient populations, and professional responsibilities. Completing reports in a timely manner, being sensitive to religious concerns of families and recognizing the importance of confidentiality in medical practice are essential.
2) The resident must demonstrate a satisfactory level of diagnostic competence and the ability to provide effective pathologic consultation under appropriate circumstances. The autopsy examination is a consultation requested of the pathologist by the attending physician and/or family. Its primary purpose is the identification of disease, its extent and the effects of medical intervention. Questions asked on the autopsy consultation form need to be addressed in a concise and respectful manner.
3) The resident must demonstrate knowledge about established and evolving diagnostic scientific practice by developing proper diagnoses and by documenting application of new knowledge in the autopsy report. In this regard, the final diagnoses rendered by the resident will be judged on accuracy. Application of new knowledge will be judged by the inclusion of literature references (when appropriate) in the report. The clinical-pathologic correlation in the report will also be used to ascertain the level of resident expertise.
4) The resident must demonstrate the ability to investigate complex cases, provide a diagnostic and consultative service and assimilate scientific evidence into their practice for the continual improvement of patient care. This includes detailed work up of cases for publication.

Leader

1) Learn the basics on how to manage an autopsy service, including morgue design, safety concerns, recruiting, and training, ordering of supplies, public health requirements and communicating with funeral homes, security services, police and the office of the chief medical examiner.

Health Advocate

1) Respond to the needs of the family of the deceased, whether these be about the diagnosis, the deceased's medical care, insurance issues etc.
2) Be willing to explain the findings of the autopsy in appropriate (lay) language and participate in post-mortem meetings with the attending physicians, relatives and pathologists.

3) Acquire appropriate QA/QC knowledge to ensure patient safety and accuracy of medical reports.

Scholar

1) Develop an individualized case-by-case approach to the conduct of an autopsy, based upon answering relevant questions that the clinical history and circumstances of the death raise.
2) Maintain and enhance professional activities through ongoing learning.
3) Critically evaluate information and its sources, and apply this appropriately to practice decisions.

4) Facilitate the learning of patients, families, students, residents, other health professionals, the public, and others, as appropriate.
5) Contribute to the creation, dissemination, application, and translation of new medical knowledge and practices.
6) Teach proper prosection and grossing techniques to more junior residents starting autopsy service.
7) Prepare and present cases at continuing medical education rounds
8) Assist more junior residents in interpreting microscopic findings and correlating them into a final cause of death.

Professional

1) Show respect for the deceased at all times, through a willingness to contact families of deceased before and after the autopsy.
2) The resident will demonstrate effective, respectful and professional communication with staff, physicians and families. This will be evaluated by faculty observation of resident performance on individual cases.

Graded Responsibility within Autopsy

During the first block of training on the autopsy service, the new trainee must be assisted and/or supervised by either a senior resident or by the attending staff pathologist.

The number of cases performed by the resident each day is limited to one (1) in the first block, and two (2) thereafter. The new trainee is also NOT expected to teach or otherwise guide rotating residents or elective students. The above limitations may be waived by the trainee, depending on his/her past experience and comfort level.

During the first 1-2 blocks on the autopsy service, the resident learns how to review a chart quickly and efficiently, double-check the validity of the consent, perform basic dissection techniques, review microscopic slides, and prepare preliminary and final autopsy reports (including gross and microscopic descriptions).

After completing 10 gross descriptions satisfactorily, the resident may elect to use autopsy worksheets for preparing the gross description.

For all trainees, the preliminary autopsy report must be completed within 48 hours of the autopsy, and the final report is expected to be completed within 60 days.

As the junior resident acquires more experience (3rd - 4th block), they are expected to review the clinical findings of each case with the supervising pathologist prior to initiating the autopsy, but may then proceed with the case independently. Depending on the skill level of the resident, and the complexity of the case, a supervisory pathologist may elect to review the dissection of the organs at the completion of the autopsy (but before the body is released). Some residents will require greater supervision during this period. The resident is expected to review the microscopic slides when available, and prepare a microscopic report, which is then reviewed with the staff pathologist using a multi-headed microscope at a mutually agreeable time.

New trainees may present their cases at Autopsy Demo, but are not expected to present at CPC rounds until after their first 2 blocks are completed (depending on experience).

In the subsequent blocks, the resident is expected to conduct an autopsy and prepare a preliminary report after consultation with the staff pathologist.

Third and fourth year residents have considerable responsibility for assisting with training of junior residents, supervision of elective students and assisting with undergraduate teaching. The degree of supervision of fourth year residents (senior and chief) will vary with the capabilities and often the initiative of the resident and will be at the discretion of the supervising pathologist. It is anticipated that the senior residents will be able to conduct all aspects of the autopsy with minimal supervision.

Autopsy/morgue safety:

Background

Performing an autopsy is a unique educational experience involving many hours of professional time and resources. The information gathered from performing an autopsy and the conclusions made by the pathologist may be valuable to the pathologist, clinicians, decedent's family and sometimes the community. However, the information gained from doing an autopsy must always be weighed against the potential risks to those involved in performing the autopsy. If safety precautions are used and updated regularly, the morgue should be a safe environment for pathologists, morgue technicians, students and other hospital personnel.

Training/Preparation - Morgue Staff/pathologists/residents

Breeches in morgue safety procedures may adversely affect the health and safety of the person involved in the autopsy, but also the health and safety of others in the morgue (and possibly people outside the morgue). Therefore, it is best practice to have policies and procedures that all work place users are familiar with.

All morgue technicians, pathologists, residents, and students require formal training sessions on morgue safety and the use of personal protective equipment before commencing any work in the morgue. This training should also include relevant training for lab aides, secretaries, transcriptionists, cleaning staff and any other personnel who are required to enter the morgue.

Formal training will instruct morgue users on the science and rational behind morgue safety procedures. Understanding why morgue safety protocols and procedures are in place increases the likelihood that morgue personnel will follow the safety precautions. Because of new emerging infectious diseases (i.e. SARS, avian flu, CJD, etc) it may be optimal practice to update and educate staff on the procedures at set intervals (i.e. yearly). This ongoing education is required to ensure that pathologists and other morgue personnel are familiar with any changes to the autopsy safety protocol, and that new personnel are familiar with the protocols prior to working in the morgue environment. Pathologists have an ethical, moral, and professional responsibility to do what is in their power to ensure a safe morgue environment for themselves, other colleagues, residents, fellows, observers, and other hospital personnel.

Prosectors, pathologists, and residents should advise their personal physicians and/or occupation health providers of the potential infectious exposures due to performing autopsies. Most health care providers recommend immunization for hepatitis B. Immunization for special disease such as small pox may be required for military autopsies. Regular TB skin tests, chest x-rays, and/or blood work to monitor hepatitis status may be recommended. Additional precautions or monitoring may be necessary for physicians or prosectors with special health needs (such as chronic corticosteroid use or chronic illness that may cause immune suppression).

Observers

Observers of autopsy should have a valid educational reason to see an autopsy. The recommended limit of observers per autopsy is limited by the size of the autopsy suite. The number of observers permitted access to the morgue, and whether observers are permitted at all, is within the discretion of the responsible staff pathologist. Observers should present valid identification to the pathologist and sign a release form stating that they understand the potential risks of observing an autopsy. The observer's full name and contact telephone number should be recorded in a log book or on the autopsy worksheet even if they are only present for a portion of the autopsy. Contact information may be needed if an unexpected infectious disease is found during autopsy or histological examination. Prior knowledge of airborne infectious disease (SARS, TB, etc) would exclude observers from observation unless an observation room with separate air circulation is available.

Observers with medical conditions causing immune suppression should consult an expert health care provider prior to exposure to an autopsy.

Other personnel requiring morgue access

Janitors, body moving services, porters, garbage collection, radiology technologists, and any other person requiring access to the morgue will feel safer in the morgue environment if they are familiar with safety protocols and standards. It is optimal that these personnel are not permitted into the morgue during the performance of an autopsy (with perhaps the exception of radiology in special circumstances). People entering the front doors to the morgue are required to sign in with the name, date and time (or alternately have a personalized electronic access key or code).

Further details on morgue safety and infectious considerations are available in the Calgary Laboratory Services Policy manual and the Autopsy "Mini-Manual".

RESIDENCY TRAINING IN NEUROPATHOLOGY

PGY-2 Forensic Pathology

Site:	Office of the Chief Medical Examiner, 4070 Bowness Road NW
Preceptor:	Assistant Chief Medical Examiner
Length of Rotation:	4 weeks (may be extended to 8 weeks if desired)

Definition

Forensic pathology is a subspecialty of anatomic and general pathology which focuses on the interpretation of diseases of and injuries to the human body. The role of a forensic pathologist incorporates the formulation of an opinion as to the cause and manner of death taking into consideration the history, circumstances and autopsy findings as a whole. The work undertaken may have medical – legal significance requiring testimony as an expert witness.

Background

The Office of the Chief Medical Examiner (OCME) is a branch within the Justice Services Division of the Ministry of Justice & Attorney General, Government of Alberta. Its area of jurisdiction is the province of Alberta with a population of approximately 3.8 million.

The OCME is responsible for the investigation and certification of all deaths in Alberta caused by violence, as well as all unexplained and some unattended natural deaths in accordance with the Fatality Inquiries Act. It is managed from two regional offices - one located in Edmonton and the other in Calgary. The Chief Medical Examiner is based in Edmonton but regularly attends in Calgary. The Edmonton office administers all investigations in the northern part of the province while the Calgary office administers the geographic area south of a line extending from Jasper to Hobbema and down to Provost.

Within both offices are 3 - 4 Assistant Chief Medical Examiners. In Edmonton approximately 1700 deaths are examined in a year and in Calgary approximately 1500 deaths are examined a year. Approximately half of these examinations are external examinations. Homicide numbers vary year to year: 53-63 in Edmonton (2008-2010) and 24-53 in Calgary (2008-2010). In addition there is a network of some 112 fee-for-service community Medical Examiners (all of whom are Physicians) who investigate approximately 500 - 700 deaths a year across the province with the assistance of the RCMP and municipal police forces.

A histology laboratory is located in Calgary and a toxicology laboratory is located in Edmonton. Two PhD chemists direct the toxicology laboratory. The office staff comprised of medical investigators (MIs), histology and toxicology technologists, mortuary technicians, a research officer, administrators and administrative support personnel.

Specific Objectives

Medical Expert

- ✓ Familiarization with the role and operation of the OCME in sudden death investigation
- ✓ Understand similarities and differences between hospital and forensic autopsies
- ✓ Introduction to the differing laws and regulations in Canada in relation to death investigation between provinces
- ✓ Familiarization with the Fatality Inquiries Act and the Fatality Inquiries Regulations for the Province of Alberta
- ✓ Understand the value, techniques and theory of death scene investigation as it applies to forensic pathology
- ✓ Introduction to the challenges of identification of human remains with particular reference to the use of fingerprinting, odontology, radiology and anthropology
- ✓ Perform a complete and appropriate assessment of a deceased individual both adult and pediatric
- ✓ Learn dissection techniques in the autopsy room in both adult and pediatric autopsies including when to order appropriate ancillary studies such as histology, microbiology, toxicology, neuropathology, radiology, genetic studies, virology etc
- ✓ Familiarization with autopsy findings in a variety of sudden natural and violent deaths
- ✓ Familiarization with autopsy histology
- ✓ Understand proper techniques and theory for collection and handling of toxicology specimens
- ✓ Understand proper techniques and theory for collection and handling of trace evidence in the course of a suspicious death autopsy
- ✓ Introduction to the concepts of forensic science relevant to forensic pathology e.g. toolmark analysis, blood stain analysis, entomology, forensic biology, forensic photography etc
- ✓ Introduction to the concept of external examination
- ✓ Understand how to properly certify cause and manner of death
- ✓ Understand mechanisms of death
- ✓ Introduction to the limits of a forensic autopsy i.e. questions that cannot be answered despite full autopsy

- ✓ Familiarization with the principles of physical violence and the effects this can have on a human body: including sharp force, blunt force, crush, asphyxia, firearms, blast, electrocution, heat, cold, toxin related, fire and water related injuries
- ✓ Introduction to court room proceedings and presentation of evidence as an expert witness Forensic Pathologist
- ✓ Adequate preparation for the Forensic Pathology component of Canadian AP/GP Examinations

Communicator

- ✓ Develop rapport, trust and professional relationships with staff at the OCME, allied professionals and any members of the public such as relatives/friends of the deceased who are encountered during this elective
- ✓ Demonstrate an understanding of the importance of timeliness, clarity and accuracy in all communications
- ✓ Convey effective oral and written information with regards case investigations in which you have the responsibility of producing an official autopsy report
- ✓ Introduction to the concept of 'lay language reports' when conveying complex scientific information

Collaborator

- ✓ Participate effectively and appropriately within the multidisciplinary team setting of medico-legal death investigation
- ✓ Understand the role of the OCME in working with a diverse population with a multitude of religious, ethnic, cultural and personal beliefs surrounding death, the body of the dead, autopsy and the afterlife. In particular how these different beliefs may effect every stage of the death investigation
- ✓ Understand how different autopsy techniques may impact the later preparation of a body by a funeral home and subsequent viewing by relatives and friends of the deceased

Leader

- ✓ Introduction to the concept of team leadership by the forensic pathologist in the setting of a homicide investigation and team dynamics
- ✓ Understand and demonstrate the principles of quality assurance, quality control and quality improvement as it applies to forensic pathology
- ✓ Demonstrate effective personal time management with regards maximizing educational opportunities whilst at the OCME
- ✓ Manage workload appropriately to ensure timely completion of work

Health Advocate

- ✓ Understand and demonstrate an understanding of all necessary safety precautions in the autopsy room, laboratory and at death scenes with emphasis on both day to day casework and high risk autopsies
- ✓ Understand the role of the pathologist in ensuring the safety of all morgue staff and observers at autopsy
- ✓ Understand the concepts of public health as it applies to the work conducted at the OCME e.g. responding appropriately to the likes of infectious disease diagnoses, potential hereditary disease diagnoses, potential unsafe environments (e.g carbon monoxide leaks, work related fatalities, product design flaws, bioterrorism), death trends that may pose an immediate or emerging threat to the health of a population (e.g. adulterants to illicit drugs) and mass fatality events
- ✓ Understand how forensic pathology can promote the health of communities and populations through the study of mechanisms, causes and manners of death e.g. deaths in infancy, maternal deaths, deaths from epilepsy

Scholar

- ✓ Demonstrate continual learning through e.g. the process of reflective learning, the conduct of personal practice audits, the posing of appropriate learning questions, accessing journal articles relevant to work undertaken or witnessed, integrating new learning into practice, documenting and sharing this learning.
- ✓ Understand critical evaluation of information from its source and apply this appropriately in the workplace
- ✓ Actively participate in opportunities for learning by attending:
- ✓ OCME Alberta Forensic Pathology Rounds: Thursday afternoons 1500 – 1600 hrs in both Edmonton and Calgary by videoconference
- ✓ Request appropriate personal professional feedback and provide effective feedback during the elective

Professional

- ✓ Assist in the provision of the highest quality of service that the OCME can provide to all Albertans with competency, integrity, honesty and respect
- ✓ Respect confidentially and privacy with regards any conversation about case work seen or conducted in the OCME

particularly when outside the office and after the elective

- ✓ Recognition of professional limits and actively seek advice and assistance from senior staff members. A resident will never be made to conduct any procedures on any individuals that are felt to be out of their scope of experience, competence or comfort level.

Requirements

1. Residents are advised to bring in appropriate 'morgue footwear'. Scrubs, surgical gowns, plastic aprons, hair nets, eye shields and face masks are provided as well as cut-proof gloves, latex and latex free gloves are all provided in house.
2. Residents are advised to ensure that all appropriate vaccinations are up to date prior to attending at the OCME for their elective.
3. Residents should aim to complete in the region of 20 full autopsy cases (non homicides) and will only ever be invited to undertake an examination on a decomposed individual.
4. Residents are expected to complete the communication notes in the OCME database MEDIC when they complete their autopsies in a timely fashion (preferably immediately after autopsy).
5. Residents are expected to discuss the cause and manner of death immediately after autopsy with the supervising medical examiner although the certificate will be signed by the supervising medical examiner.
6. Residents are responsible for writing up the official autopsy report for their cases into the OCME database MEDIC with guidance from the supervising medical examiner and on the agreed departmental template in a timely fashion (preferably within a day or two after autopsy)
7. Residents are expected to follow through and review and discuss toxicology, histology and other ancillary investigation results as they pertain to the case they completed whilst still at the OCME.
8. Residents should request to attend at court cases where the Chief or an Assistant Chief Medical Examiner is providing testimony.
9. Residents should request to spend at least an hour with the Chief of an Assistant Chief Medical Examiner to discuss the proper method for completing a death certificate.
10. Residents are asked to hold their building access card with the appropriate level of responsibility and care as would be expected of a rotating resident and return the aforementioned access card at the end of the elective.
11. Residents are requested that they do not remove any data (paper, digital, microscope slide or other) from the department.
12. Residents are reminded in particular not to discuss the circumstantial or autopsy information learnt regarding homicide cases outside of the department as this may be critical privileged information relevant to criminal proceedings.

Evaluation

Evaluation of progress through the elective will include:

- ✓ On-going day to day evaluation
- ✓ An informal mid –way point one to one with the elective preceptor (This should allow for adequate time during the elective to address any perceived exposure/training deficits or deficiencies in performance)
- ✓ End of elective written in-house exam during final week or rotation
- ✓ End of elective PowerPoint presentation on a topic to be decided in-rotation with preceptor.
- ✓ End of elective formal evaluation through One45 in the form of an ITER (In-Training-Evaluation-Report)

RESIDENCY TRAINING IN NEUROPATHOLOGY

PGY-2 Pediatric Pathology

Duration of the rotation: 8 weeks

Description/Overview

Alberta Children's Hospital (ACH), a tertiary care centre that serves southern Alberta, offers a full range of paediatric medical and surgical subspecialty services.

The Department of Pathology and Laboratory Medicine at ACH provides comprehensive pathology services for this site. Because of regionalized health care, we also provide expertise in foetal and placental pathology for all of the hospitals in Calgary. Therefore, placentas and challenging obstetrical pathology case materials are sent to the pathology laboratory at ACH for examination. This creates a high volume service, which is ideal for teaching paediatric, foetal, and placental pathology.

The Department of Pathology and Laboratory Medicine at ACH provides paediatric pathology rotations for Anatomical Pathology and Neuropathology residents in the University of Calgary programs. Our residents participate in the evaluation of a large volume of diverse clinical specimens, which represent a broad spectrum of paediatric and placental pathology, including highly complex cases. The residents will be involved in paediatric, perinatal, and foetal autopsies (>200 are performed at ACH each year).

In addition to participating in the AP clinical service and teaching rounds at ACH, the resident will also be exposed to formal weekly one-on-one teaching with an “off service” paediatric pathologist. Because many paediatric tumours and other surgical lesions are rare, AP and NP residents rotating for 8 weeks would normally have an opportunity to see very few of these interesting cases. Therefore, the Department provides to residents extensive archival collections of teaching cases, including glass slides and anonymous copies of the corresponding surgical pathology reports, organized in binders by organ system.

The primary objective for this rotation is for residents to gain specific knowledge and experience so that they can safely and competently handle paediatric and perinatal pathology cases, including those cases that may require subsequent sub-specialist consultation.

Their development as Medical Experts/Clinical Decision-Makers will be achieved by: mentoring by four paediatric pathologists with diverse skills and interests and exposure to an abundance of clinical material and educational resources.

Their skill-sets as Communicators, Collaborators, Health Advocates and Professionals will be enhanced through interactions with colleagues, clerical and technical staff, families and other members of the health care team.

The abundant case materials and staffing at ACH provide ample opportunity for clinical research providing ample opportunity to enhance the Scholar role..

Pertaining to the Manager role, residents are expected to understand the Quality Assurance measures and the Quality Indicators currently in used in the Laboratory. They may also participate in mortality rounds.

Duties and Responsibilities of Rotating Residents:

On call schedule:

Residents are expected to be "on service" at the ACH during regular working hours on weekdays – except Friday mornings which are dedicated to the Academic Half-day Didactic sessions.

Other absences require the approval of the supervising pathologist

Surgical/Placental Pathology Duties and Responsibilities:

1) Describe and dictate gross appearance of surgical specimens received in the pathology laboratory, in accordance with assigned activities. This responsibility will be shared with the grossing technologist, but the resident will be expected to assume a major role in this area, with the exception that the majority of placenta gross examinations will be performed by the technologist.
2) Participate in intraoperative consultations.
3) Discuss the interpretation of histologic preparations with staff pathologists, review previous slides relevant to the current case, plan strategies for further workup, secure pertinent additional information from attending clinicians as needed to arrive at a diagnosis, and dictate microscopic descriptions/diagnoses.
4) Complete diagnostic reports within two or three working days for most surgical specimens. Exceptions will occur but the resident must be sensitive to the urgency of diagnosis and act accordingly. Generating a diagnostic report is a priority.
5) Become familiar with the common "Quality Indicators" used in Anatomic Pathology, including the following:
    a. Report turnaround time
    b. Frozen section/final diagnosis correlation
    c. Patient incidents
    d. Technical and accessioning errors
    e. Safety concerns
    f. Critical values in anatomic pathology

Autopsy Pathology Duties and Responsibilities:

1) The majority of the autopsies performed at ACH are:
    a. perinatal autopsies related to high risk pregnancy
    b. stillbirths
    c. pregnancy terminations for fetal congenital anomalies.
    d. early fetal losses

2) Prior to beginning an autopsy, the resident is expected to review the consent form, review the health record, prepare a clinical history, and discuss pertinent clinical issues relevant to the case with the attending pathologist and, if necessary, the clinician.
3) The resident should become familiar with standard protocols for pediatric and perinatal autopsies, including metabolic and skeletal dysplasia protocols.
4) The resident is expected to perform a complete autopsy entailing gross and microscopic examination of all organs, including extremities, head and neck, internal organs, and the ordering of appropriate post-mortem clinical laboratory tests.
5) The resident should is expected to prepare a Preliminary Autopsy report within 48 hours after autopsy.
6) The resident is expected to dictate gross descriptions of normal and pathologic findings in organs in an appropriate manner, discuss interpretation of histologic and other materials secured at autopsy and arrive at final diagnoses in conjunction with the designated staff pathologist.
7) Final autopsy reports must be completed within four weeks of performance of the autopsy. The report should interpret autopsy findings, both gross and microscopic, in the context of the clinical history and clinical laboratory results, and provide clinical-pathologic correlations.
8) The resident should review and summarize the relevant literature relating to each case.
9) The resident is expected to perform a minimum of 8 autopsies during his/her 8 weeks rotation.

Hospital rounds & other Pediatric Pathology learning opportunities:

Participation in the following rounds is encouraged:

1) Developmental Rounds, Thursdays, 8 AM (held in TRW building adjacent to Health Sciences): a multidisciplinary review of prenatal and perinatal cases encompassing clinical history, diagnostic imaging, prognosis, management, and pathological correlation
2) Paediatric Oncology Rounds, Wednesdays, 4 PM (held in Diagnostic Imaging at ACH): a multidisciplinary review of current oncology cases. Pathologists and/or residents frequently present the pathologic findings.
3) Paediatric Brain-Cutting, Thursdays 9:30am: the neuropathologist performs gross brain examinations in ACH autopsy suite
4) Interesting Case Reviews, Friday afternoons: Recent surgical or autopsy pathology cases are reviewed amongst staff pathologists with discussion of workup and diagnosis in the ACH multi-headed microscope room.
5) Paediatric GI Pathology Rounds, once a month, Friday Noon: Recent GI Pathology cases are reviewed with clinicians.
6) Surgical Pathology Slide Conference + Autopsy Demo, Fridays, 8 AM, held in B05 at FMC: every 4 - 6 months, the surgical pathology slide session followed by the autopsy demo is devoted entirely to pediatric pathology cases. These should be organized by the resident rotating through pediatric pathology
7) Grand Pediatric Rounds, weekly, Wednesday, 8:30 AM, ACH Auditorium

Review of archival collections of interesting cases is highly recommended:

- Glass slides and accompanying surgical pathology reports: ~2000 cases, organized by organ system in binders, are located the department library. These include cases of both common and rare pathological entities. Organ system slide boxes are also located in the residents' room.
- Museum of congenital heart malformations: a wide variety of wet specimens is available for residents to review with staff pathologists.

Pediatric Pathology Systemic Review sessions:

1) Thursday afternoons: pediatric pathology systemic review with a designated staff pathologist who is not on service.

2) Topics may include, but may not be limited to:
    a. Placenta – placenta development, gross and microscopic examination
    b. Chromosomal anomalies
    c. Congenital malformation/syndromes
    d. Cardiovascular I – fetal heart development, common congenital cardiac malformations
    e. Cardiovascular II – examples of congenital malformations
    f. Common pediatric tumors – rhabdomyosarcoma, neuroblastoma, bone tumors. Wilms' tumors
    g. Tumor cytogenetics
    h. Pediatric Neuropathology

General Objectives:

Throughout the pediatric pathology rotation, the resident is expected to:

1) Demonstrate proper understanding of basic pathophysiological mechanisms and specialty-specific knowledge appropriate for the resident's level of training.
2) Display work attitudes and practices appropriate for a pathologist-in-training.
3) Demonstrate good judgment when deciding when to ask an attending for help (i.e., know one's limitations).
4) Write clear, concise and accurate surgical and autopsy reports.
5) Present pathological cases at appropriate rounds.
6) Demonstrate an ability to review literature using Internet searches, standard references, texts, and periodicals
7) Demonstrate safe and appropriate handling of surgical and autopsy materials.
8) Perform competent review of autopsy consent form with understanding of limitations.
9) Demonstrate good working relationships with clinicians, staff pathologists, technical staff, and clerical staff.

Rotation-Specific Objectives:

Upon completion of the paediatric pathology rotation, the resident shall meet the following objectives related to Paediatric Surgical Pathology, Placental Pathology, Foetal or Perinatal Autopsy Pathology, and Paediatric Autopsy Pathology:

Placental Pathology Objectives:

1) Perform complete gross examination and description of singleton and multiple pregnancy placentas.
2) Understand basic placental anatomy and histology.
3) Recognize and understand the following entities:
    a. Amnion nodosum
    b. Subchorionic intervillositis
    c. Chorioamnionitis / chorionic vasculitis / funisitis
    d. Dichorionic twin placenta
    e. Villus edema/hydrops
    f. Hemorrhages and hematomas (types)
    g. Infarction
    h. Monochorionic twin placenta (including twin-twin transfusion)
    i. Post-mortem changes
    j. Single umbilical artery
    k. Tumours (including chorangioma, umbilical cord hemangioma, partial and complete hydatidiform moles)
    l. Umbilical cord embryonic remnants
    m. Villitis/intervillositis
    n. Common placental findings in maternal diabetes
    o. Common placental findings in maternal hypertension

Fetal, Perinatal and Pediatric Autopsy Pathology Objectives:

1) Perform competent review of health records (including mother's) in perinatal and fetal cases.
2) Perform competent review of autopsy consent form.
3) Demonstrate competent autopsy technique (as outlined in AFIP Monograph).

Know:

- Normal developmental anatomy and histology
- How to approach a macerated fetus
- How to approach a fragmented fetus
- How to perform a metabolic or skeletal dysplasia autopsy
- How (and based upon what indications) to collect tissues/specimens for cytogenetic, molecular and metabolic studies.

Understand:

- Malformations, deformations, disruptions, sequences, and associations.
- Common genetic and non-genetic syndromes presenting in the perinatal period

Be familiar with these pathological entities:

- Abdominal wall defects (omphalocele/gastroschisis)
- Amniotic bands
- Common congenital cardiac malformations (VSD, ASD, Tetrology of Fallot, Hypoplastic left heart syndrome, DORV, AVSD)
- Common congenital infections (CMV, herpes, parvovirus)
- Diaphragmatic hernia
- Gastrointestinal atresia
- Hydrops fetalis/cystic hygroma
- Intrauterine growth retardation
- Necrotizing enterocolitis/meconium peritonitis

- Neural tube defects
- Oligohydramnios (Potter's sequence)
- Cystic kidney diseases/renal dysplasia
- Tracheoesophageal fistula
- Common sequelae of prematurity a) Respiratory distress syndrome/Bronchopulmonary dysplasia
- Intraventricular hemorrhage

Medical Expert

1) Demonstrate the ability to accurately describe and sample gross pathology specimens.
    a. Describe the gross findings orally
    b. Describe the gross findings in writing.
    c. Appropriately cut and sample surgical specimens depending on the clinical, radiological, laboratory and other data obtained.
    d. Be proficient in the making of smears and touch preparations
    e. Be proficient in the embedding of fresh tissue and the cutting and staining of frozen sections
    f. Appropriately sample surgical specimens for rush diagnosis
    g. Effectively communicate the rush intraoperative diagnosis to operating surgeon
    h. Apply universal precautions for dealing with surgical specimens and special precautions when dealing with established or suspected infectious etiologies.
    i. Be proficient with the principles and techniques of harvesting tissue for electron microscopy, cytogenetics, molecular biology, flow cytometry and research protocols.

2) Demonstrate adequate knowledge and understanding of the methods of tissue fixation and processing in surgical pathology.
    a. Know the principles of fixation, the types of fixatives used and their indications in the practice of surgical pathology, for both light and electron microscopy.
    b. Know the principles of tissue processing including, dehydration, paraffin embedding, paraffin sectioning, osmication and plastic embedding.

3) Demonstrate knowledge of the principles of histology staining and the use of these stains in the surgical pathology examination of diseases. For this the resident will be able to:

a. Understand the basis of the routine stains and special stains used in surgical pathology
b. Understand the basis of immunohistochemical and immunofluorescence staining techniques.
c. Understand the utility of special staining techniques (immunohistochemical and immunofluorescence)
d. Understand the basis of molecular biology procedures.
e. Understand the utility of molecular biological procedures used in surgical pathology
f. Select the appropriate immunohistochemical stains and molecular biological procedures relevant to the problem based on the gross, histologic, clinical, radiologic, laboratory and other data available.
g. Interpret the normal, abnormal and artifactual findings demonstrated by each of these stains in tissue sections.
h. Interpret the normal, abnormal and artifactual findings demonstrated by use of molecular biological procedures in tissue specimens.
i. Understands the basis of morphometry.
j. Be familiar with the principles of tissue culture, karyotype preparation, chromosome banding and interface nuclear sexing techniques which are employed in cytogenetic investigations.

4) Demonstrate the ability to adequately describe and record microscopic findings.
    a. Operate and maintain a light microscope, and apply polarized optics and immunofluorescent techniques
    b. Adequately describe microscopic findings orally
    c. Adequately describe microscopic findings in the surgical pathology report.
    d. Take photomicrographs

5) Demonstrate an ability to produce a surgical pathology report with an interpretation appropriate to the clinical setting.
    a. Accurately and succinctly describe the gross and microscopic findings
    b. Correlate these findings with the known clinical, radiological, laboratory and other data.
    c. Provide pathologic diagnosis
    d. Discuss the pathophysiology of the disease process as it applies to that particular patient.
    e. Recommend any further investigations that may be helpful, based on the biopsy findings

6) Access and apply relevant information to the practice of Anatomical Pathology.
    a. Demonstrate a thorough knowledge of the normal organs of the body. The resident should be able to:
        i. Have a superior knowledge of normal gross anatomy of the body.
        ii. Have a superior knowledge of the histology of the body organs
        iii. Have a superior knowledge of the physiology of the individual body organs.

    b. Demonstrate a thorough knowledge of (including molecular genetics, molecular biology, etiology, pathophysiology, gross and microscopic pathology, and clinical pathology correlations) general pathologic reactions of the organs of the body (general pathology). For this, the resident will acquire a superior knowledge of:
        i. Mechanisms of cellular injury and repair.
        ii. Mechanisms of inflammation
        iii. Disorders of immunity and immune mediated diseases.
        iv. Disorders of genetics and the molecular basis of cell function and dysfunction
        v. Mechanisms of the process of neoplasia.
        vi. Nutritional and metabolic disorders.
        vii. The influences of environmental and toxic factors on the body.
        viii. Infectious diseases (bacterial, fungal, viral, rickettsial and parasitic) and their effects on the body.
        ix. Disorders affecting the fetus, infant, and child, including a thorough knowledge of embryological development and its relationship to malformations, and the molecular biology and genetics associated with malformations.
        x. How specific derangement's, focal or general, in tissue structure and/or function leads to specific clinical, physiologic, and radiological and laboratory abnormalities.

7) Demonstrate a superior knowledge of the pathology and pathophysiology (including molecular genetics, molecular biology, etiology, pathophysiology, gross and microscopic pathology, and clinical pathological correlations) of disorders of the organs systems (systemic pathology).

    a. Disorders affecting the heart and blood vessels.
    b. Disorders affecting the hematopoietic system, lymph nodes and the mechanisms of coagulation, thrombosis and fibrinolysis.
    c. Disorders affecting the respiratory system.
    d. Disorders affecting the head and neck
    e. Disorders affecting gastrointestinal tract, liver, biliary tract and pancreas.
    f. Disorders affecting kidneys and genitourinary tract
    g. Disorders affecting breast
    h. Disorders affecting endocrine system
    i. Disorders affecting integument
    j. Disorders affecting skeletal system and connective tissues
    k. Disorders affecting nervous system

<u>Communicator</u>

1) Residents will demonstrate an ability to establish a relationship of trust and respect with clinical and non-clinical colleagues, patients, their family, and the community.
2) Communicate effectively with technical and clinical colleagues informally, through formal verbal presentations

(presentation at rounds, meetings), and in the form of surgical pathology reports.

3) Demonstrate ability to answer questions on etiology, pathogenesis, and pathology of disease without preparation and be able to openly admit circumscribed ignorance without loss of face.
4) Obtain and synthesize information from clinical and other colleagues and listen carefully.
5) Discuss information freely with clinicians and, if necessary, patients and their families.
    a. Communicate effectively (verbally and in writing) the results of pathology investigations in a timely fashion to colleagues, so that patient care is not delayed or jeopardized.
    b. Be willing to discuss results with family, as they become available and provide a time-line for the final diagnosis.
    c. Assist in the continuing education of physicians and other members of the hospital staff by participating effectively in interdisciplinary rounds and meetings (including presentation at rounds).

Collaborator

1) The resident will become part of the clinical team through interaction with clinical colleagues directly and at rounds.
2) Demonstrate the ability to advise clinical colleagues on the appropriateness of obtaining histology specimens and follow up examinations of these, and to advise on further appropriate investigations.
3) Understand the role of intra- and extra-departmental review of diagnostic material
4) Contribute effectively to other interdisciplinary team activities
    a. recognize the expertise of other health team members
    b. respect the role and opinions of other health team members
    c. Understand the principles of tissue acquisition for research.

Leader

1) Effectively utilize information technology to optimize patient care, as well as to facilitate continual self-learning
    a. Use a word processing program
    b. Use patient related clinical and laboratory database programs.
    c. Use graphics and presentation programs.
    d. Be familiar with the application of computers in laboratory medicine in general and anatomic pathology in particular.
    e. Be an effective time manager
    f. Plan self-learning and self-assessment learning goals and objectives.
    g. Maintain a Continuing Medical Education (CME) log book of the rounds, lectures and other CME activities they have attended.

2) Demonstrate an ability to run a quality control program in surgical pathology. For this the resident should be able to:
    a. Run a conference with colleagues in the discussion of routine, interesting, and difficult cases.
    b. Be familiar with quality control programs for tissue processing and staining.
    c. Be familiar with quality control for frozen section diagnosis – final diagnosis comparison for surgical pathology specimens.
    d. Understand mechanisms used to ensure accurate and rapid preparation and distribution of all surgical pathology reports
    e. Understand methods of effective indexing and storage of specimens and reports and methods for efficient data retrieval.
    f. Understand the legal obligations for tissue paraffin block and glass slide storage.
    g. Understand the financing of the anatomical pathology laboratory and how to set about acquiring additional funding or achieving improved economy.

3) Work effectively and efficiently in a health care organization. For this the resident will:
    a. Understand the roles and responsibilities of a surgical pathologist
    b. understand principles of laboratory management and administration
    c. understand methods of quality control and quality assurance in surgical pathology
    d. understand the organization and function of the Canadian health care system
    e. understand the principles of workload measurement within the laboratory

f. demonstrate a knowledge of laboratory safety
g. Understand finite health care resources and use discretion in utilization of resources without unnecessary waste.
h. Utilize time and resources effectively to balance patient care, learning needs and outside activities.

Health Advocate

The resident will be competent to:

1) Recognize and respond to those issues, circumstances, or situations in which advocacy on behalf of patients or community is appropriate. The resident will be competent to:
    a. Identify population at risk for specific disease entities
    b. Recognize the fundamental role of epidemiological research in understanding the pathophysiology and etiology of disorders.
    c. Understand the importance of promoting and reinforcing to the public and profession the essential contribution of laboratory medicine in health.
    d. Demonstrate the ability to recognize those situations, especially regarding infectious or communicable diseases, that require consultation or notification of the Department of Health.
    e. Understand procedures for disposal of chemical and biological waste.
    f. Demonstrate understanding and compliance with safety guidelines of the laboratory. They should have a thorough grasp of measures taken to avoid biohazards in the laboratory and to avoid chemical spills.
    g. Understand how public policy is developed with regard to health and disease.

Scholar

The resident will be able to:

1) Develop, implement and document a personal continuing education strategy. The resident will:
    a. Accept the responsibility for self-learning and self-evaluation
    b. Demonstrate the ability to identify gaps in knowledge and expertise.
    c. Access personal learning needs
    d. Choose an appropriate learning method and subject matter(s)
    e. Evaluate the outcome of the self-learning experience.
    f. Apply the principles of critical appraisal to sources of medical information. For this the resident will:
    g. Incorporate an attitude of scientific inquiry and the use of evidence into the process of making pathologic diagnoses.
    h. Select appropriate questions to be answered.
    i. Research the literature for answering the questions.
    j. Keep current with evidence based literature pertinent to the practice of surgical pathology.
    k. Facilitate the learning of patients, students, residents and other health professionals. For this the resident will:
    l. Demonstrate an ability to utilize surgical cases for teaching of undergraduates, residents and clinical colleagues
    m. Assist in continuing medical education of physicians and other members of the hospital staff.
    n. Demonstrate skills in taking photographs of gross specimens as well as microphotographs for the purpose of teaching and communication
    o. Teach pathological principles at rounds, conferences and other forums.

2) Contribute to the development of new knowledge. For this the resident will:
    a. Demonstrate the ability to pose a research question, to formulate a plan that attempts to answer the question, and to carry out the research according to program requirements.
    b. Conduct a literature search relevant to the question
    c. Identify, consult and collaborate with the experts with the expertise in the area of the research.
    d. Propose a methodological approach to answer the question.
    e. Carry out the research proposal
    f. Defend and disseminate the results of the research
    g. Identify areas for further research which arise from the results
    h. Acquire skills in the development of guidelines relevant to the practice of surgical pathology

Professional

1) Deliver the highest quality practice of surgical pathology with integrity, honesty and compassion. The resident will be competent to:
    a. Demonstrate effective consultation, as an anatomical pathologist, with respect to patient care, education and legal opinion.
    b. Recognize personal limits of expertise. The resident must be able to:
    c. Recognize when he/she should seek consultation from another pathologist.
    d. Recognize when he/she should seek consultation from a specialist other than a pathologist.
    e.
2) Exhibit appropriate personal and interpersonal behaviours. For this the resident will:
    a. Demonstrate appropriate interpersonal relationships with peers, supervisors, support and clinical staff, showing concern, respect for others, and sensitivity to gender/ethnic and other social issues
    b. Respond appropriately to criticism
    c. Act as an appropriate role model for students and others.
    d. Address interpersonal differences in professional relations.
    e. Maintain an appropriate balance between personal and professional roles
    f. Be accountable for his/her personal actions
    g. Have a high degree of self-awareness
    h. Be reliable and conscientious in the discharge of his/her professional responsibilities.

3) Practice surgical pathology in an ethically responsible manner that respects the medical, legal and professional obligations of belonging to a self-regulating body. The resident will:
    a. Demonstrate an ethical approach to the performance of duties within the laboratory
    b. Know and understand the professional, legal and ethical codes to which physicians are bound
    c. Understand and apply relevant legislation relating to the health care system in order to guide him/her in the practice of surgical pathology.

4) Recognize, analyze and know how to deal with unprofessional behaviour in the practice of medicine, including but not exclusive to health problems such as psychiatric illness or substance abuse, taking into account local and provincial regulations. The resident will fulfill these objectives by:
    a. Integrating into a busy tertiary care surgical pathology service to obtain intensive hands-on experience.
    b. Assume graded responsibility commensurate with experience and seniority. (see appendix for further details)
    c. In depth and systematic study of surgical pathology through participation in education as well as patient-service oriented rounds.
    d. Regular attendance at academic half-day and specialty rounds
    e. Diligent preparation of cases prior to signing them out with a staff pathologist on a doubled-headed microscope.
    f. Attending the didactic teaching program that cover core knowledge of pathology and Can Meds competencies as pertaining to surgical pathology
    g. Participation in continuing Medical Education sessions.
    h. Participation in resident research day starting in PGY2
    i. Participation in teaching medical students, junior residents, technical staff, etc.
    j. Regular assessment of their performance at rounds and sign-out sessions with staff pathologist
    k. Biannual formal evaluation examinations
    l. Using current journals and surgical pathology texts as well as Internet resources.
    m. Obtaining experience in laboratory organization and quality assurance.
    n. Applying safety principles with regard to hazards associated with the laboratory.
    o. Discussion of ethical problems related to the practice of pathology with peers and teaching staff.

PGY-2 Cytopathology

Definition
Cytopathology is that branch of medicine specializing in diagnosis through the evaluation of the cellular manifestation of disease.

Background
At the University of Calgary all Cytopathology is centralized at the Diagnostic & Scientific Centre (DSC), the core laboratory facility located in the University Research Park at 3535 Research Road NW, Calgary. Consolidation was completed in May 2004. In September 2006, CLS changed all gynecological cytology processing to Liquid-based Cytology (LBC) using ThinPrep Cytyc (Hologic) technology. Automation was implemented in early 2007 for pre-screening using the ThinPrep Imaging system. At the start of the rotation, trainees meet with the Section Head of Cytopathology to discuss goals and objectives. Thereafter, they work with the cytopathologist assigned to the service for that day.

General Objectives:
On the completion of this rotation, the Trainee will achieve competency in the cytological manifestations of common diseases and be able to diagnose common disease processes of non-gynecological cytopathology.

Specific Objectives:

Medical Expert

1) Understand the principles of cytologic diagnosis
2) Understand the basic principles of cell biology and pathogenesis, and the cytological changes that occur in disease states
3) Demonstrate knowledge of methods for acquiring specimens by exfoliative or fine needle aspiration techniques
4) Demonstrate knowledge of specimen fixation, processing, staining, and slide screening procedures
5) Demonstrate knowledge of and skill in identifying and classifying the appearance of normal cells sampled by exfoliative or fine needle aspiration techniques
6) Demonstrate knowledge of and skill in identifying and classifying the cytologic appearance of common neoplastic, pre-neoplastic, and non-neoplastic diseases sampled by exfoliative or fine needle aspiration techniques
7) Demonstrate knowledge of the criteria for satisfactory and unsatisfactory specimens
8) Demonstrate knowledge of the indications, use, and limitations of ancillary techniques as an aid to diagnosis

Communicator

1) Act as a Consultant to clinical colleagues in the interpretation and relevance of cytologic findings with particular regard to their significance in the management of the patient
2) Demonstrate understanding and awareness of the importance of timeliness, clarity, and accuracy in all communications
3) Formulate comprehensive and clinically meaningful reports and be able to communicate reports effectively in both oral and written form.

Collaborator

1) The Trainee must know the value of multi-disciplinary collaboration in patient management decisions
2) Demonstrate the ability to advise on the appropriateness of obtaining cytologic specimens and following examination of these, to advise on further appropriate investigations

Leader

1) Demonstrate knowledge of the principles of quality control, quality assurance, and quality improvement in a Cytopathology laboratory

Health Advocate

1) Understand the need to ensure that Cytopathology practices and test selection are regularly monitored and evaluated to

determine that they meet the needs of the community

2) Demonstrate knowledge of the principles of cervical cancer screening and the role the laboratory plays in that activity

Scholar

1) Critically appraise sources of medical education

Professional

1) Deliver highest quality of care with integrity, honesty, and compassion
2) Demonstrate a professional attitude to colleagues, students, other health professionals, and laboratory support staff
3) Have and appreciation of their own limitations as a medical expert and know the necessity of seeking appropriate second opinions

Duration: 4 weeks (one block)

Evaluation

Performance will be evaluated at the completion of the rotation. Evaluation will be carried out by the Rotation Supervisor, teaching Cytotechnologists, and members of the Cytopathology Medical Staff by the completion of an ITER.

The end of rotation evaluation will include a 1-hour exam on Non-gynecological cytology – 40 cases.

Additional exams and slide reviews as determined by cytopathologists or Section Head.

Procedure

From the commencement of the rotation, the Trainee will be expected to report on some non-gynecological cases of the day. These will then be signed out with the attending Pathologist(s) of the day.

Whatever free time remains should be spent in independent study and review of the teaching file. The Trainee will be excused for the Training Programs Educational half day. The rest of the time is to be spent in the Cytopathology rotation. Any absences must be discussed with the Rotation Supervisor.

Attendance at the Cytopathology CME sessions, teleconferences and Quality Committee is recommended.

Rotation Supervisor: Dr. Marie Dvorakova or designated Cytopathologist on respective service for that day.

Mandatory tutorials:

During the rotation, tutorials in non-gynecologic cytopathology will be taught by arrangement with the teaching Cytotechnologists.

They will include the following topics:

Week 1	Introduction to the Cytopathology Division and preparation methods. LBC processing.
Week 2	Body fluid cytology to include pleural, peritoneal and pericardial effusions, CSF and pelvic washings. Head & Neck, Salivary glands,
Week 3	GI Tract, Liver, Pancreas, CBD
Week 4	Breast, Thyroid, Urine, kidney, adrenal

Throughout the tutorial weeks, the Trainee will receive slide quizzes based on material that has been covered. Emphasis will be given to areas of difficulty. The Trainee will be required to screen the slide fully, mark any cells of concern and interpret the findings. The slide will then be reviewed and discussed by the teaching Cytotechnologist.

Teaching cytotechnologists:

Joanne Barber	Rosemin Kara	Beata Pozarski

Cytopathology Medical Staff:

Dr. Máire Duggan	Dr. Ranjit Waghray	Dr. Margaret Gorecki
Dr. Walid Mourad	Dr. Moosa Khalil	Dr. Anna Sienko
Dr. Yinong Wang	Dr. Marie Dvorakova	Dr. Ethan Flynn
Dr. Steve Gorombey	Dr. Nicole Bures	

Research opportunity and other CME sessions:

Trainees are recommended to attend any staff or guest lecture presentations pertaining to Cytopathology. These are well advertised within the department.

Trainees are encouraged to participate in clinical/basic science research in collaboration with staff. Slide sets, teleconferences and audio-video materials are available in the department for review.

Required reading and references:

A large selection of books and journals pertaining to cytopathology are held in the department. Additional copies of texts are available for use by Trainees. These must not be taken out of the department without express permission.

1. "Comprehensive Cytopathology" Marluce Bibbo, 2nd Edition 1997, WB Saunders, Philadelphia, Pennsylvania, USA.
2. "The Art and Science of Cytopathology" Richard DeMay, 1996, American Society of Clinical Pathologists, press, Chicago, Illinois, USA.
3. Cytology, Diagnostic principles and clinical correlated. E. Cibas, B. Ducatman 3rd Ed 2008.
4. Atlas of Diagnostic Cytopathology, B. Atkinson Saunders 2004.
5. Modern Cytopathology, Geisinger et al. Churchill Livingstone 2004.
6. Journals – Diagnostic Cytopathology, Cancer Cytopathology, Acta Cytologica

Contact phone numbers:

Marie Dvorakova, Cytopathology	403-770-3823
Cytotechnologists	403-770-3272

GRADED RESPONSIBILITY within PGY2

Graded responsibility is the process by which a resident, during the course of their 5 years of training, not only obtains the knowledge and skills, but also the attitudes necessary to function as a competent specialist in anatomical pathology. While the requirements of different career paths may vary, this program seeks to ensure a core level of competence for all residents at the completion of their training in their capacities as 1) diagnosticians, 2) educators, 3) administrators, and 4) researchers.

Gradation of resident responsibility is commensurate with advancing levels of seniority in the surgical pathology rotations. Realistically, the short time frame devoted to the other rotations limits such expectations.

The training program is designed to initially equip residents with basic skills (eg: gross dissection) and later to expose them to more difficult and complex pathology through elective and advanced surgical pathology rotations. A gradation of responsibility based on the faculty's evaluation and expectation of the residents' performance is thus effected.

It is critical that serious errors in diagnosis should not occur and hospital by-laws require that all pathology reports be signed by a staff pathologist. Thus the implementation of graded responsibility is not always successful, since the moral, ethical, and legal obligations of the staff pathologists must be accommodated.

Graded responsibility may include, but is not limited to:

1) Coverage of Anatomic Pathology on call service beginning in the PGY-2 year after completion of Autopsy and Surgical Pathology block training. (See Resident On Call duties for specific details) With increasing expertise the resident will be allowed to perform more duties without direct supervision to the point where they may be allowed to handle and sign out non-complicated surgical pathology cases by themselves.

2) A resident should have grossed and signed out the following types of cases by the end of the stated PGY year:

PGY-1:	Simple bowel resection/colectomy, hysterectomy, breast biopsy and mastectomy
PGY-2:	Thyroidectomy, parathyroidectomy, salpingo-oophorectomy, lobectomy (lung), esophagogastrectomy, soft tissue tumor resection, "cone" biopsy of the cervix, TME

PGY2:

Gross Dissection:

Throughout the course of the year, it is expected that the resident will become proficient at gross dissection and will eventually acquire sufficient proficiency to require guidance primarily in the setting of difficult and complicate cases. The gross descriptions should ultimately require little to no editing and should be clear, concise and use appropriate terminology. A manual outlining the optimal method of gross dissections of specialized specimens is available for reference. Pathology assistants, staff pathologists and senior residents are always on hand to provide assistance when necessary. Before starting to gross, the staff pathologist and resident on duty must meet to review and assign specimens to the resident. The assigned specimens should provide educational experience. The resident is responsible for proof reading the gross descriptions and making appropriate revisions of the cases assigned to him/her.

Microscopy:

In the first months reporting is focused on the large specimens grossed by the residents and biopsies relating to common pathological entities. At this time, the resident is not expected to review all trays of slides. As the year advances and the resident progresses the caseload will be increased. It is recommended that the caseload increase

reflect a mutual agreement between the staff pathologist and the resident. The residents are encouraged to inform the Program Director if they feel that service work is impacting on their education.

The cases are examined by the resident, who is asked to record his/her opinion (in writing or via dictation). The work is then reviewed by both resident and staff together and the pathologist will finalize the case. Under certain circumstances the trainee will be expected to communicate with clinicians in order to obtain further information and/or to convey, orally, results of pathological studies. With time, the resident is expected to initiate the order of special stains ancillary studies.

Frozen Sections:

The resident and the pathologist will attend a frozen section together and gross examination dissection and microscopy review will be conducted in unison. The objective at this point is to provide the resident with exposure to (i) the appropriate gross and microscopic approach to specimens commonly submitted for frozen section, (ii) the limitations of the procedure and (iii) the mode of clinicopathologic correlation on those settings. They are expected to competently carry out the technical component of a frozen section. The amount of supervision diminishes with time such that residents can do all parts of the frozen section unsupervised except issuing the final report.

PGY-3&4: NEUROPATHOLOGY CORE

PGY-3: Neuropathology Core Objectives

By the end of this year of training, the resident will handle all routine neuropathology cases by integrating available clinical information with a fundamental knowledge of the nervous system. The knowledge gained by the end of this year should be at the level of standard neuropathology textbooks.

Medical Expert:

Definition:

As a Junior Trainee Medical Expert, the resident integrates most CanMEDS Roles, applying medical knowledge clinical skills, and professional attitudes in their provision of patient-centred care. The *Medical Expert* is the central physician Role in the CanMEDS framework.

Key and Enabling Competencies: Junior Trainees are able to…

1. Function as junior consultants, integrating most of the CanMEDS Roles to provide standard, ethical and patient-centred medical care

1.1. In consultation with staff neuropathologists, perform a consultation effectively, including documenting assessments and recommendations in written and/or verbal form in response to a request from another health care professional.

1.1.1. With guidance from staff neuropathologists, act as consultants to other clinicians on the interpretation and relevance of neuropathological findings, and be able to discuss the relevance of these findings to further diagnostic investigations.

1.1.2. After consulting with staff neuropathologists, advise effectively on the appropriateness of obtaining specimens required for neuropathological examination and diagnosis, as well as advise on further appropriate investigations

1.1.3. Interpret neuropathology in the context of neuroimaging

1.1.4. Provide useful suggestions for genetic and molecular testing for routine nervous system diseases

1.2. Identify and appropriately respond to relevant ethical issues arising in Neuropathology practice, including management and retention of specimens

1.3. Prioritize professional duties effectively and appropriately

2. Establish and maintain clinical knowledge, skills and attitudes appropriate to Neuropathology

2.1. Apply knowledge of the clinical and fundamental biomedical sciences relevant to Neuropathology practice, including:

2.1.1. Normal gross and microscopic anatomy, physiology and biochemistry of the nervous system and surrounding structures

2.1.2. Embryologic, foetal, and postnatal development of the nervous system

2.1.3. Clinical epidemiology of nervous system disorders

2.1.4. Cytologic appearance of normal and abnormal cells in cerebrospinal fluid (CSF)

2.1.5. Cell biology, immunology and the basic histopathological reactions that occur in disease states of the nervous system

2.1.6. Inherited and acquired metabolic disorders, and the effects of toxins and nutrition on the nervous system

2.1.7. Manifestations of systemic disease in the nervous system

2.1.8. Infectious diseases of the nervous system including classification and staining characteristics

2.1.9. Tumours of the nervous system, its coverings and surrounding structures, including classification and modes of treatment and their consequences

2.1.10. Degenerative diseases of the nervous system and the molecular changes and genetic bases underlying these disorders

2.1.11. Vascular disorders of the nervous system including hypoxic-ischemic injury, haemorrhage, and abnormalities of the vasculature

2.1.12. Pathophysiological effects of trauma to the head, neck and spine, and its effects on the nervous system, its coverings, and vascular supply, including the relevance of these to forensic pathology

2.1.13. Diseases of myelin

2.1.14. Inherited and acquired developmental anomalies including malformations of the nervous system

2.1.15. Gross, light microscopic and ultrastructural appearance of normal and diseased tissues of the nervous system and skeletal muscle

2.1.16. Diseases of the pituitary

2.2. Describe the CanMEDS framework of competencies relevant to Neuropathology

2.3. Implement a personal program to enhance professional competence

2.4. Contribute to the enhancement of quality care in their practice, integrating the available best evidence and best practices

3. Perform a complete and appropriate assessment of a specimen

3.1. Identify issues to be addressed in examination of a surgical specimen or at post mortem

3.2. Ensure appropriate informed consent is obtained for procedures

3.3. Obtain a history that is relevant, concise and accurate

3.4. In standard cases, examine tissues for relevant macroscopic and microscopic findings to arrive at an accurate diagnosis and provide information important for patient management

3.5. Select appropriate investigative methods in a resource-effective and ethical manner

3.7. Use effective diagnostic problem solving and judgment to interpret available data and integrate information to generate differential diagnoses

3.8. Manage specimens safely and ethically with respect to biohazard matters and to diagnostic utility

4. Demonstrate proficient and appropriate use of diagnostic procedural skills

4.1. Under staff guidance perform effective, appropriate, and timely diagnostic procedures relevant to neuropathology, relating findings to the clinical history, including:

4.1.1. Complete post mortem examination of the nervous system involved by common diseases, with full description and diagnosis at gross and microscopic levels

4.1.2. Dissection and sampling of routine neurosurgical specimens

4.1.3. Imprint / smear / touch cytology specimens, and frozen sections both at the time of intraoperative consultation at later at gross examination.

4.1.4. Satisfactory gross and microscopic imaging (photography and photo microscopy) of tissues

4.1.5. Forensic autopsy examination of the nervous system, including the skeletal and meningeal surroundings as well as the major vascular supply

4.1.6. Specimen collection for ultrastructural examination

4.2. Describe the principles of effective, appropriate, and timely diagnostic procedures relevant to their practice, including:

4.2.1. Tissue processing, and the use of different fixatives in the laboratory

4.2.2. The use and indications for special tissue preparation methods and staining, as well as the technical principles underlying these, including:

4.2.1.1. Immunohistochemistry including immunofluorescence

4.2.1.2. Molecular biological techniques

4.2.1.3. Electron microscopy

5. Demonstrate insight into their own limitations of expertise and seek appropriate consultation from other health professionals

Communicator:

Definition:

As Communicators, Junior trainees effectively facilitate the pathologist-physician dialog and exchanges that occur in relation to biopsies and autopsies.

Key and Enabling Competencies: Junior Trainees are able to...

1. Accurately collect and synthesize relevant information and perspectives about patients and their families

1.1. Gather relevant information about the patient, including their age, sex, ethnic background

1.2. Gather information about the patient's disease, its presentation, and its course

2. Convey effective oral and written information about a diagnostic pathological examination

2.1. Deliver routine diagnostic information to medical colleagues and other professionals in such a way that it is understandable and encourages discussion and participation in decision-making

2.1.1. Prepare routine post mortem examination reports in an effective and timely fashion, including an accurate and complete diagnosis, a pertinent history, a useful summary relating the diagnosis to the clinical findings, and a concise gross and microscopic description

2.1.2. Communicate the results of a routine surgical tissue examination in an accurate, timely, clear, and complete fashion, including pertinent history, details of the specimens, and their diagnoses

2.2. Maintain clear, accurate, and appropriate records (e.g. written or electronic; e.g. portfolio) of diagnostic examinations and results

2.3. Present verbal reports of pathological examinations effectively, including at the time of surgery and when an emergent or unexpected and serious finding is determined

Collaborator

RESIDENCY TRAINING IN NEUROPATHOLOGY

Definition:

As Collaborators, Junior Trainees effectively work within a health care team to achieve optimal patient care.

Key and Enabling Competencies: Junior Trainees are able to...

1. Participate effectively and appropriately in an interprofessional health care team

1.1. Interact in a professional manner with Neuropathology technical staff in a manner appropriate to their roles and responsibilities

1.1.2. Describe the technical aspects of the work performed by laboratory technologists and technicians, including the techniques they use, the difficulties they encounter, their workload, and their exposure to dangerous substances or tools

1.1.3. Be cognizant of each individual's social context in the technical staff and appreciate how that can impact their performance

1.1.1. Describe the job duties and limitations of transcriptionists

1.2. Interact with medical students and residents in a manner appropriate to their roles and responsibilities; assist them with their learning in a manner commensurate with their level of knowledge and focus of their training

1.3. Interact with surgeons and nurses in a professional and appropriate manner, using clear language or written text

1.3.1. Communicate effectively both the adequacy of the tissue sample and the diagnostic considerations at the time of a biopsy with an intraoperative consultation

1.3.2. Identify clearly the specimen and patient when communicating via telephone

1.3.3. Identify who should receive a verbal report; ensure they receive it and that it is adequate

1.4. Contribute to and act as a member of professional teams that treat patients

1.4.1. Participate in interprofessional team meetings

1.4.2. Recognize members in professional teams and know their positions and functions

1.4.3. Respect team ethics, including confidentiality, resource allocation and professionalism

1.5. Maintain a professional relationship with other pathologists and Neuropathologists

1.5.1. Effectively utilize the various skills of colleague pathologists and Neuropathologists

1.5.2. Seek advice and consultation appropriately; likewise always be willing to provide advice and consultation to a colleague

1.5.3. Work with colleagues to facilitate quality assurance and quality control

2. Work with other health professionals effectively to prevent, negotiate, and resolve interprofessional conflict

2.1. Respect other colleagues and members of interprofessional teams

2.2. Employ collaborative negotiation to resolve conflicts

2.3. Respect differences and address misunderstandings and limitations in other professionals

2.4. Recognize one's own differences, misunderstandings and limitations that may contribute to interprofessional tension

2.5. Reflect on interprofessional team function

3. Provide quality assurance and quality control by identifying conflicts, errors, and incompetence that impinge on patient care and deal with them in a professional manner

3.1. Recognize an error and follow an appropriate and prescribed set of guidelines to report and amend the error (either personal or colleague error)

Leader:

Definition:

As Leaders, Junior Trainees are integral participants in health care organizations, organizing sustainable practices, making decisions about allocating resources, and contributing to the effectiveness of the health care system.

Key and Enabling Competencies: Junior Trainees are able to...

1. Promote the operation and effectiveness of their Neuropathology services

1.1. Work collaboratively with other professionals with the goal of improving the delivery of Neuropathology services

1.2. Participate in systematic Neuropathology quality process evaluation and improvement

1.2.1. Present cases in Neuropathology quality assurance sessions

1.2.2. Participate in Neuropathology laboratory quality control, such as checking controls

1.2.3. Ensure that laboratory practices and test selection are subject to quality control and evaluated on an ongoing basis

1.3. Allocate and judiciously utilize finite Neuropathology health care resources, balancing effectiveness, efficiency and access with optimal patient care, appropriateness, expense, and overall laboratory resource utilization

1.4. Identify areas in which Neuropathology services might be improved and promote or implement changes to effect these improvements

2. Assist in the effective management of their Neuropathology practice

2.1. Participate in and implement processes to ensure personal practice improvement

2.1.1. Attend meetings related to Neuropathology on a regular basis

2.1.2. Maintain a log of important or interesting cases and relevant information concerning those cases (learning portfolio)

2.2. Employ information technology appropriately for the functions of Neuropathology, including patient care, medical education, and quality control

Health Advocate:

Definition:

As Health Advocates, Junior Trainees responsibly use their expertise and influence to advance the health and well being of individual patients, communities, and populations.

Key and Enabling Competencies: Junior Trainees are able to...

1. Identify the health needs of the various communities that they serve

1.1. Identify and describe the various communities that they serve, especially how their common characteristics affect their

health and disease

1.2. Identify the competing interests between the communities served and other populations

2. Identify the determinants of health and disease and promote the health of the overall population they serve

2.1. Describe the structure and identify points of influence in the health care system

2.2. Describe the ethical and professional issues and limitations inherent in health advocacy, including personal conflicts, responsibility, social justice, autonomy, integrity and idealism

2.3. Seek to identify the determinants of health and disease in the population, especially those that impact the neurological well being of its members and those that can be modified

2.3.1. Identify pathological findings, and related laboratory results, that have community and population relevance beyond that of the individual patient or patient's family

2.4. Identify the inherent conflict between their role as a health advocate for a patient or community with that of manager or gatekeeper, including the personal conflict between competing demands of an individual Neuropathologist

2.5. Describe the role of the medical profession and the Neuropathology community in advocating collectively for health and patient safety

Scholar:

***Definition*:**

As Scholars, Junior Trainees demonstrate a lifelong commitment to reflective learning, as well as the creation, dissemination, application and translation of medical knowledge.

Key and Enabling Competencies: Junior Trainees are able to...

1. Maintain and enhance professional learning

1.1. Use surgical and autopsy cases to inform learning

1.1.1. Identify key elements in Neuropathology cases that are unexplained, poorly defined, ambiguous, or require further investigation

1.1.2. Search and review standard texts that pertain to these key elements

1.1.3. Document the results of reviews and retain it for future use

1.2. Develop a personal system of ongoing learning

1.2.1. Create and implement a strategy to systematically and practically review recent literature

1.2.2. Participate in clinical rounds and research questions that arise from those encounters

1.2.3. Participate in continuing medical education events, including regional, national and international meetings

1.2.4. Create and implement a strategy to manage learned information

1.3. Develop and implement a strategy to use updated information or knowledge in clinical practice

1.3.1. Systematically employ updated information in the evaluation of tissue

1.3.2. Systematically report updated information while preparing pathology reports

1.4. Document the learning process

2. Educate and otherwise facilitate the learning of students, residents, physicians and other health care professionals

2.1. Apply the principles of learning to the medical education of students and health care professionals

2.2. Develop and select effective teaching strategies and content relevant to a medical audience

3.3. Work collaboratively with other health care professionals to identify the educational needs and anticipated learning outcomes of a medical audience

3.4. Use a variety of techniques and effectively communicate with a specific medical audience

3.4.1. Prepare and lecture effectively on topics related to Neuropathology

3.4.2. Effectively present Neuropathology in clinical and professional meetings

3.4.3. Target the level of teaching and techniques used to the audience

3.5. Listen and provide effective feedback to a medical professional or medical audience

3.6. Assess a teaching encounter (lecture, mentoring, individual), evaluate its effectiveness and suggest how it may have been improved

4. Present and discuss pathology results in clinical, medical education, and quality control - quality assurance conferences

4.1. Prepare clear, effective, and informative oral presentations at hospital, quality control, clinical, or professional conferences

4.2. Encourage discussion, questions, and interactions in the presentation

Professional:

***Definition*:**

As Professionals, Junior Trainees are committed to the health and well-being of individuals and society through ethical practice, profession-led regulation, and high personal standards of behaviour.

Key and Enabling Competencies: Junior Trainees are able to...

1. Demonstrate a commitment to patients, profession, and society through ethical practice

1.1. Exhibit appropriate professional behaviours in practice, including honesty, integrity, commitment, compassion, and respect

1.2. Demonstrate a commitment to delivering the highest quality care and maintenance of competence in Neuropathology

1.3. Recognize and appropriately respond to ethical issues encountered in practice of Neuropathology

1.4. Recognize and appropriately manage conflicts of interest

1.5. Adhere to the principles and limits of patient confidentiality as defined by professional practice standards and the law; recognize that vague areas exist and determine how to confront or manage these when they conflict with patient care

2. Demonstrate a commitment to physician health and sustainable practice in Neuropathology

2.1. Balance personal and professional priorities to ensure personal health and a sustainable practice

2.2. Strive to heighten personal and professional awareness and insight

2.3. Recognize other professionals in need and respond appropriately

PGY-4: Neuropathology Core Objectives

By the end of this year of training, the resident will handle all neuropathology cases, both routine and complex; by integrating available clinical information with a fundamental knowledge of the nervous system. The knowledge gained by the end of this year should be at the level of standard neuropathology textbooks.

Medical Expert: As *Medical Experts*, Senior Trainees integrate all of the CanMEDS Roles, applying medical knowledge, clinical skills, and professional attitudes in their provision of patient-centred care. *Medical Expert* is the central physician Role in the CanMEDS framework.

1. Function effectively as consultants, integrating all of the CanMEDS Roles to provide optimal, ethical and patient-centred medical care

1.1. Perform a consultation effectively, including the presentation of well-documented assessments and recommendations in written and/or verbal form in response to a request from another health care professional

1.1.1. Act as consultants to other pathologists, neurologists, neurosurgeons and other clinicians on the interpretation and relevance of neuropathological findings, with particular regard to their significance in the management of the patient, and be able to discuss the significance of these findings with regard to further diagnostic investigations and ongoing therapeutic management of the patient

1.1.2. Advise effectively on the appropriateness of obtaining specimens required for neuropathological examination and diagnosis and, following examination of these, to advise on further appropriate investigations

1.1.3. Describe the role of neuroimaging in the investigation and diagnosis of diseases of the nervous system

1.1.4. Describe the role of genetic testing and counselling in the investigation and diagnosis of genetically determined diseases of the nervous system

1.2. Identify and appropriately respond to relevant ethical issues arising in Neuropathology practice, including management and retention of specimens

1.3. Recognize and respond to the ethical dimensions in medical decision-making

1.4. Demonstrate the ability to prioritize professional duties effectively and appropriately

1.5. Demonstrate medical expertise and knowledge relevant to situations other than patient care, such as providing expert legal testimony or advising governments on matters relevant to Neuropathology

2. Establish and maintain clinical knowledge, skills and attitudes appropriate to Neuropathology

2.1. Apply knowledge of the clinical and fundamental biomedical sciences relevant to Neuropathology practice, including:

2.1.1. Normal gross and microscopic anatomy, physiology and biochemistry of the nervous system and surrounding structures

2.1.2. Embryologic, foetal, and postnatal development of the nervous system

2.1.3. Clinical epidemiology of nervous system disorders

2.1.4. Cytologic appearance of normal and abnormal cells in cerebrospinal fluid (CSF)

2.1.5. Cell biology, immunology and the basic histopathological reactions that occur in disease states of the nervous system

2.1.6. Inherited and acquired metabolic disorders, and the effects of toxins and nutrition on the nervous system

2.1.7. Manifestations of systemic disease in the nervous system

2.1.8. Infectious diseases of the nervous system including classification and staining characteristics

2.1.9. Tumours of the nervous system, its coverings and surrounding structures, including classification and modes of treatment and their consequences

2.1.10. Degenerative diseases of the nervous system and the molecular changes and genetic bases underlying these disorders
2.1.11. Vascular disorders of the nervous system including hypoxic-ischemic injury, haemorrhage, and abnormalities of the vasculature
2.1.12. Pathophysiological effects of trauma to the head, neck and spine, and its effects on the nervous system, its coverings, and vascular supply, including the relevance of these to forensic pathology
2.1.13. Diseases of myelin
2.1.14. Inherited and acquired developmental anomalies including malformations of the nervous system
2.1.15. Gross, light microscopic and ultrastructural appearance of normal and diseased tissues of the nervous system and skeletal muscle
2.1.16. Diseases of the pituitary

2.2. Describe the CanMEDS framework of competencies relevant to Neuropathology

2.3. Apply lifelong learning skills of the Scholar Role to implement a personal program to keep up-to-date, and enhance areas of professional competence

2.4. Contribute to the enhancement of quality care in their practice, integrating the available best evidence and best practices

3. Perform a complete and appropriate assessment of a specimen

3.1. Identify and explore issues to be addressed in examination of a surgical specimen or at post mortem
3.2. Ensure appropriate informed consent is obtained for procedures
3.3. Obtain a history that is relevant, concise and accurate
3.4. Demonstrate awareness of economic and ethical issues, including how patients' and families' cultural background and preferences might influence the performance of the examination
3.5. Perform macroscopic and microscopic examinations of tissues that are relevant to arrive at an accurate diagnosis and provide information important for patient management
3.6. Select appropriate investigative methods in a resource-effective and ethical manner
3.7. Demonstrate effective diagnostic problem solving and judgment to address neuropathological problems, including interpreting available data and integrating information to generate differential diagnoses
3.8. Demonstrate knowledge of the safe and ethical management of specimens with respect to biohazard matters and to diagnostic utility

4. Demonstrate proficient and appropriate use of diagnostic procedural skills

4.1. Demonstrate effective, appropriate, and timely performance of diagnostic procedures relevant to their practice, relating findings to the clinical history, including:
4.1.1. Complete post mortem examination of the nervous system, with full description and diagnosis at gross and microscopic levels
4.1.2. Dissection and sampling of neurosurgical specimens
4.1.3. Imprint / smear / touch cytology specimens, and frozen sections both at the time of intraoperative consultation and later
4.1.4. Satisfactory gross and microscopic imaging of tissues
4.1.5. Forensic autopsy examination of the nervous system, including the skeletal and meningial surroundings as well as the major vascular supply
4.1.6. Specimen collection for ultrastructural examination

4.2. Describe the principles of effective, appropriate, and timely performance of diagnostic procedures relevant to their practice, including:

4.2.1. Tissue processing and the use of different fixatives in the laboratory and the use and indications for special tissue preparation methods and staining, as well as the technical principles underlying these, including:
4.2.1.1. Immunohistochemistry including immunofluorescence
4.2.1.2. Molecular biological techniques

4.2.1.3. Electron microscopy

Communicator: As *Communicators*, Senior Trainees effectively facilitate the pathologist-physician dialog and exchanges that occur in relation to biopsies and autopsies.

1. **Accurately elicit and synthesize relevant information and perspectives about patients and their families from colleagues and other professionals**
   - 1.1. Gather relevant information about the patient, including their age, sex, ethnic background
   - 1.2. Gather information about the patient's disease, its presentation, and its course
   - 1.3. Seek out and synthesize relevant information from other sources, such as a patient's family, caregivers, and other professionals

2. Convey effective oral and written information about a diagnostic pathological examination to physicians, colleagues, other professionals (including the legal profession), and when appropriate to patients and families
   - 2.1. Deliver diagnostic information to medical colleagues, other professionals and, as requested, to a patient or their family in a humane manner and in such a way that it is understandable and encourages discussion and participation in decision-making
     - 2.1.1. Communicate written findings of a post mortem examination in an effective, and timely fashion, including an accurate and complete diagnosis, a pertinent history, a useful summary relating the diagnosis to the clinical findings, and a concise gross and microscopic description
     - 2.1.2. Communicate the results of a surgical tissue examination in an accurate, timely, clear, and complete fashion, including pertinent history, details of the specimens, and their diagnoses
     - 2.1.3. Issue timely, clear and accurate written reports as the major means of communication with clinicians in the ongoing management of patients with neurologic disease
     - 2.1.4. Explain to patients, their families, and patient advocacy organizations, when appropriate, the ramifications of neurological disease
   - 2.2. Maintain clear, accurate, and appropriate records (e.g. written or electronic) of diagnostic examinations and results
   - 2.3. Present verbal reports of pathological examinations effectively, including at the time of surgery and when an emergent or unexpected and serious finding is determined

3. Discuss relevant issues about pathology with the larger community, including other health professionals, technical staff, learners, and those outside the health professions

   - 3.1. Use language, figures, diagrams, and pathological images appropriate to the audience
   - 3.2. Respect the sensitivities of a diverse audience, including but not limited to the impact of gender, religion, and cultural beliefs on the information presented and the views expressed
   - 3.3. Encourage discussion, questions, and interactions in the encounter
   - 3.4. Present medical information to the public or media about a medical issue, as appropriate and under proper authorization
   - 3.5. Describe the principles of presentation of evidence in court, including what is admissible evidence, the nature of unfairly prejudicial evidence, and the difference between medical certainty and medical likelihood

4. When appropriate, accurately convey relevant information and explanations to patients and families
   - 4.1. Deliver information to a patient and family in a humane manner and in such a way that it is understandable, encourages discussion and participation in decision-making
   - 4.2. Explain pathological terminology and techniques in such a manner that a patient and family can understand how pathological diagnoses are determined
   - 4.3. Recognize that being a good communicator is a core clinical skill for physicians, and that effective physician-patient communication can foster patient satisfaction
   - 4.4. Respect patient privacy, confidentiality and autonomy
   - 4.5. Listen effectively and be aware of and responsive to nonverbal cues
   - 4.6. Communicate results of a post-mortem examination to appropriate family members in terminology they can

understand, as requested

4.7. Address challenging communication issues effectively, such as obtaining informed consent, delivering bad news, and addressing anger, confusion, and misunderstanding

Collaborator: As *Collaborators*, Senior Trainees effectively work within a health care team to achieve optimal patient care.

1. Participate effectively and appropriately in an interprofessional health care team

1.1. Describe the roles and responsibilities of the Neuropathology technical staff and interact with them in an appropriate and professional manner

1.1.1. Describe the job duties and limitations of transcriptionists

1.1.2. Describe the technical aspects of the work performed by laboratory technologists and technicians, including the techniques they use, the difficulties they encounter, their workload, and their exposure to dangerous substances or tools

1.1.3. Be aware of the social context of each individual in the technical staff with whom the Neuropathologist interacts, and appreciate how that can impact their performance

1.2. Describe the roles and responsibilities of medical students and residents, interact with them appropriately according to these descriptions, and assist them with their learning in a manner commensurate with their level of knowledge and focus of their training

1.3. Recognize the specific roles of professionals providing surgical tissues, including surgeons and nurses, and interact with them in a professional manner, using clear language or written text

1.3.1. Communicate effectively both the adequacy of the tissue sample and the diagnostic considerations at the time of a biopsy with an intraoperative consultation

1.3.2. Identify clearly the specimen and patient when communicating via telephone

1.3.3. Indicate who should receive a verbal report and be certain they obtain it and that it is adequate

1.4. Contribute to and act as a member of professional teams that treat patients

1.4.1. Participate effectively in interprofessional team meetings

1.4.2. Recognize members in professional teams treating patients and know their positions and functions

1.4.3. Respect team ethics, including confidentiality, resource allocation and professionalism

1.4.4. Demonstrate leadership in a health care team, where appropriate

1.5. Maintain a professional relationship with other pathologists and Neuropathologists

1.5.1. Appreciate the various skills of colleague pathologists and Neuropathologists

1.5.2. Seek advice and consultation appropriately; likewise always be willing to provide advice and consultation to a colleague

1.5.3. Work with colleagues to facilitate quality assurance and quality control

1.5.4. Demonstrate leadership in areas of expertise

2. Work with other health professionals effectively to prevent, negotiate, and resolve interprofessional conflict

2.1. Demonstrate a respectful attitude towards other colleagues and members of an interprofessional team

2.2. Work with other professionals to prevent conflicts

2.3. Employ collaborative negotiation to resolve conflicts

2.4. Respect differences and address misunderstandings and limitations in other professionals

2.5. Recognize one's own differences, misunderstandings and limitations that may contribute to interprofessional tension

2.6. Reflect on interprofessional team function

3. Provide quality assurance and quality control by identifying conflicts, errors, and incompetence that impinge on patient care and deal with them in a professional manner

3.1. Recognize an error and follow an appropriate and prescribed set of guidelines to report and amend the error (either

personal or colleague error)

Leader: As *Leaders*, Senior Trainees are integral participants in health care organizations, organizing sustainable practices, making decisions about allocating resources, and contributing to the effectiveness of the health care system.

1. Promote the operation and effectiveness of their health care organization and systems, with an emphasis on Neuropathology services

1.1. Work collaboratively with other professionals with the goal of improving the delivery of health care and, in particular, Neuropathology service

1.2. Participate in systemic Neuropathology quality process evaluation and improvement
- 1.2.1. Participate in Neuropathology quality assurance sessions; demonstrate knowledge of the methods for professional quality assurance
- 1.2.2. Demonstrate knowledge of the methods of quality control and improvement in the Neuropathology laboratory
- 1.2.3. Participate in Neuropathology laboratory quality control
- 1.2.4. Ensure that laboratory practices and test selection are subject to quality control and evaluated on an ongoing basis in order to meet the community needs

1.3. Allocate and judiciously utilize finite Neuropathology health care resources, balancing effectiveness, efficiency and access with optimal patient care, appropriateness, expense, and overall laboratory resource utilization

1.4. Identify areas in which Neuropathology services might be improved and promote or implement changes to effect these improvements

1.5. Describe the structure and function of the health care system as it relates to Neuropathology and Neuropathologists
- 1.5.1. Identify other specialties and specialists that utilize Neuropathology services
- 1.5.2. Identify the relevance of Neuropathology to quality assurance in the overall health care system
- 1.5.3. Identify how Neuropathology receives its funding in various health care models (e.g. provincial funding, private funding, etc)

1.6. Describe principles of health care financing, including physician remuneration, budgeting and organizational funding

2. Serve in administration and leadership roles, as appropriate

2.1. Participate effectively in committees and meetings that relate to Neuropathology or health care in general
2.2. Use scientific evidence in Neuropathology to help guide health care and health care policy
2.3. Balance effectiveness and efficiency with quality in optimal Neuropathology examinations, recognizing the importance of allocation of finite health care resources
2.4. Identify a conflict in professional opinion, communicate with colleagues and if possible resolve the conflict

3. Assist in the effective management of their Neuropathology practice

3.1. Demonstrate an understanding of finances and human resources as they relate to the management of Neuropathology practice and the laboratory

3.2. Apply evidence-based and management processes for cost-appropriate neuropathological examinations

3.3. Help plan relevant elements of health care delivery (e.g., work schedules)

3.4. Participate in and implement processes to ensure personal practice improvement
- 3.4.1. Attend meetings related to Neuropathology on a regular basis
- 3.4.2. Maintain a log of important or interesting cases and relevant information concerning those cases

3.5. Employ information technology appropriately for the functions of Neuropathology, including patient care, medical education, and quality control

Health Advocate: As Health Advocates, *Senior Trainees* responsibly use their expertise and influence to advance the health and well being of individual patients, communities, and populations.

1. Respond to individual patient health needs and issues as part of patient care

1.1. Discuss autopsy results with and advocate for a deceased patient's family, especially with regard to genetic risks of disease and environmental influences on disease

2. Identify, respond to, and promote the health needs of the various communities that they serve

2.1. Identify and describe the various communities that they serve, especially how their common characteristics affect their health and disease

2.2. Identify opportunities for advocacy, health promotion and disease prevention in the communities that they serve, and respond appropriately

2.3. Identify the competing interests between the communities served and other populations, and when necessary try to mitigate these conflicts

3. Identify the determinants of health and disease and promote the health of the overall population they serve

3.1. Describe the structure and identify points of influence in the health care system

3.2. Describe how public policy impacts on the health and neurological well being of the populations served and identify both beneficial and adverse effects of these policies

3.3. Describe the ethical and professional issues and limitations inherent in health advocacy, including personal conflicts, responsibility, social justice, autonomy, integrity and idealism

3.4. Seek to identify the determinants of health and disease in the population, especially those that impact the neurological well being of its members and those that can be modified

3.4.1. Identify pathological findings, and related laboratory results, that have community and population relevance beyond that of the individual patient or patient's family

3.4.2. Report results of pathological investigations that are relevant or important to the population to appropriate authorities or governmental organizations

3.5. Describe and, when appropriate, implement approaches to changing determinants of neurological and behavioural health in the population

3.5.1. Participate appropriately in professional and public discussions concerning the diagnosis and management of neurological disorders in the health care system

3.5.2. Describe appropriately in a public forum important pathological or forensic findings that bear on the health of the population

3.5.3. Propose policies that aim to ameliorate or mitigate the causes or adverse effects of neurological diseases on the population when appropriate

3.6. Identify and confront the inherent conflict between their role as a health advocate for a patient or community with that of manager or gatekeeper, including the personal conflict between competing demands of an individual Neuropathologist

3.7. Describe the role of the medical profession and the Neuropathology community in advocating collectively for health and patient safety

Scholar: As Scholars, Senior Trainees demonstrate a lifelong commitment to reflective learning, as well as the creation, dissemination, application and translation of medical knowledge.

1. Maintain and enhance professional activities through ongoing learning

1.1. Use surgical and autopsy cases to inform learning

1.1.1. Identify key elements in Neuropathology cases that are unexplained, poorly defined, ambiguous, or require

further investigation
1.1.2. Search and review published literature, including electronic and printed material that pertain to these key elements
1.1.3. Document the results of literature review and retain it for future use

1.2. Develop a personal system of ongoing learning
1.2.1. Create and implement a strategy to systematically and practically review recent literature
1.2.2. Participate in clinical rounds and research questions that arise from those encounters
1.2.3. Participate in continuing medical education events, including regional, national and international meetings
1.2.4. Create and implement a strategy to manage learned information

1.3. Develop and implement a strategy to use updated information or knowledge in clinical practice
1.3.1. Systematically employ updated information in the evaluation of tissue
1.3.2. Systematically report updated information in prepared pathology reports
1.3.3. Evaluate the impact of any change in pathology practice by determining their accuracy, predictive value and usefulness to clinicians

1.4. Document the learning process

2. Facilitate the learning of patients, families and the public, as appropriate
2.1. Respond appropriately to the questions and concerns of patients and their families
2.2. Educate patients and their families, using appropriate language about the specific methods and results of neuropathological studies
2.3. Present information and educate the public about Neuropathology and issues related to Neuropathology

3. Educate and otherwise facilitate the learning of students, residents, physicians and other health care professionals
3.1. Apply the principles of learning to the medical education of students and health care professionals
3.2. Develop and select effective teaching strategies and content relevant to a medical audience
3.3. Work collaboratively with other health care professionals to identify the educational needs and anticipated learning outcomes of a medical audience
3.4. Use a variety of techniques and effectively communicate with a specific medical audience
3.4.1. Prepare and lecture on topics related to Neuropathology effectively
3.4.2. Present Neuropathology in clinical and professional meetings effectively
3.4.3. Target the level of teaching and techniques used to the audience

3.5. Listen and provide effective feedback to a medical professional or medical audience
3.6. Assess a teaching encounter (lecture, mentoring, individual), evaluate its effectiveness and suggest how it may have been improved

4. Contribute to the development, dissemination, and translation of new knowledge and practices
4.1. Describe the principles of research and scholarly inquiry
4.2. Describe the principles of research ethics to clinical trials and studies
4.3. Conduct a systematic search for evidence, based on a research question
4.3.1. Conduct an appropriate literature search, based on the research question
4.3.2. Evaluate important literature for its methodology, accuracy, importance and scope

4.4. Select and apply appropriate methods to address the research question
4.4.1. Identify, consult and collaborate with appropriate content experts to conduct the research
4.4.2. Propose a methodological approach to solve the question
4.5. Appropriately disseminate the findings of a study
4.5.1. Target the appropriate audience and include collaborators in the study
4.5.2. Identify areas for further research that flow from the results

5. Present and discuss pathology results in clinical, medical education, and quality control - quality assurance conferences

5.1. Prepare clear, effective, and informative oral presentations at hospital, quality control, clinical, or professional conferences
5.2. Encourage discussion, questions, and interactions in the presentation

Professional: As *Professionals*, Senior Trainees are committed to the health and well-being of individuals and society through ethical practice, profession-led regulation, and high personal standards of behaviour.

1. Demonstrate a commitment to patients, profession, and society through ethical practice

1.1. Exhibit appropriate professional behaviours in practice, including honesty, integrity, commitment, compassion, respect and altruism
1.2. Demonstrate a commitment to delivering the highest quality care and maintenance of competence in Neuropathology
1.3. Recognize and appropriately respond to ethical issues encountered in practice of Neuropathology
1.4. Recognize and appropriately manage conflicts of interest
1.5. Adhere to the principles and limits of patient confidentiality as defined by professional practice standards and the law; recognize that vague areas exist and determine how to confront or manage these when they conflict with patient care

2. Demonstrate a commitment to patients, profession and society through participation in Neuropathologist-led regulation

2.1. Demonstrate knowledge and an understanding of the professional, legal and ethical codes of practice
2.2. Fulfil the regulatory and legal obligations required of current practice in Neuropathology
2.3. Demonstrate accountability to professional regulatory bodies
2.4. Recognize and respond appropriately to others' unprofessional behaviours in practice
2.5. Participate in peer review of Neuropathology practice

3. Demonstrate a commitment to physician health and sustainable practice in Neuropathology

3.1. Balance personal and professional priorities to ensure personal health and a sustainable practice
3.2. Strive to heighten personal and professional awareness and insight
3.3. Recognize other professionals in need and respond appropriately

DUTIES OF THE NEUROPATHOLOGY RESIDENT

On Call

1) A single Neuropathology Resident is expected to be on call one week in four.
2) The on call period starts and ends Monday at 8:00 am in the case of a stat holiday falling on a Monday the switch will occur on Tuesday at 8:00am.
3) A call schedule shall be drawn up every 6 months and appended to the Neuropathology Residents Schedule.
4) The Call schedule is circulated to:
    a. the Program Administrator;
    b. Clinical Section Head Administrative Assistant;
    c. the Program Director;
    d. the Neuropathologists
    e. the Neuropathology residents

Surgical Service

The Neuropathology resident should be aware of what is going on in the neurological operating theatres on any given day. The operating room schedule is always available the afternoon of the previous regular business day. This allows for some planning, obtaining of historical information, and review relevant MRIs or other radiological investigations.

The Resident should always be available for a frozen section; quick sections are done in most tumor cases. If the tumor is known to be a recurrent one then the slides and report should be pulled from the files ahead of time.

Planning of time around frozen section is possible if you realize that most quick sections from standard craniotomy procedures arrive two hours after surgery starts. Usually it is three hours for a posterior fossa craniotomy. Times for transphenoidal resection of pituitary tumors and for spinal laminectomy are a little less predictable.

At the beginning of a neuropathology rotation the resident should seek the assistance of the “on-call” neuropathologist. Even after some experience, if the specimen is unusual or correct orientation is particularly important (eg. Temporal lobectomy) then the assistance of the neuropathologist should be sought. It is often better to gross smaller specimens in the morning before the technologists get busy. A day may be saved by putting through a surgical which arrives later in the day (if the specimen is small and reasonably fixed) if it is grossed and blocked to go on the processor before the technicians leave (around 4:00pm).

If a resident cannot be available for some reason or other to assist in frozen sections or to gross surgical specimens then he/she must inform the neuropathologist on duty ahead of the expected time of absence.

Microscope slides will be delivered to the Pathologist slide box. It is incumbent upon the resident to liaise with the pathologist on duty regarding what cases are taken out of the box to review. All slides should be reviewed as quickly as possible, and any relevant additional information obtained. If the resident is experienced and has achieved the appropriate level of graded responsibility, then special stains may be ordered at this stage by the resident. **Slides should be reviewed as soon as possible with the neuropathologist on duty.** The multi-head microscope is booked at 2 pm each afternoon for review of cases & sign out discussion to accommodate all residents and resident rotators around the microscope.

The neuropathology resident should accompany the neuropathology technician to the operating theatre to pick up at least one sural nerve biopsy and one skeletal muscle biopsy.

Summary of Major responsibilities for Surgical Service:

- Grossing surgical specimens
- Frozen sections
- On any day of unexpected or non-scheduled absence (eg. Sick) the resident must notify both the program administrator and the neuropathologist on duty.
- Be familiar with use of the digital camera to photograph gross specimens.

Autopsy Service *updated*

- Check with the autopsy desk in the morning for cases
- Practice taking out adult brains and spinal cord
- Practice assessing patency of carotid and vertebral vessels, taking out the spinal cord
- Perform fetal brain removal at ACH.(see fetal brain removal procedure)
- Perform brain removal on all autopsy cases with significant neuropathological interest
- Perform muscle and nerve sampling at autopsy when clinically indicated.

At the beginning of the rotation the neuropathology resident should go down and practice taking out brains from cases where no neuropathology is expected. This practice should be followed until a brain can be taken out quickly and easily. Initially the method of brain removal will be demonstrated by the supervising Neuropathologist.

Similarly, the neuropathology resident should practice assessing patency of carotid and vertebral vessels, and taking out the spinal cord by the standard method (for most autopsies) and of course the complete spinal cord in cases where indicated. Residents are also expected to become familiar with sampling muscle and nerve at autopsy when clinically indicated. All these methods will be demonstrated initially by the neuropathologist upon request by the resident.

Later on in the rotation the residents may be expected to have his/her technical performance of any of these techniques evaluated by the supervising neuropathologist. Consultation with the anatomical pathology resident on autopsy service should indicate whether or not any particular autopsy case has significant neuropathological interest.

MINIMUM NUMBER OF BRAINS:
The Neuropathology RPC determined a consensus on a minimum number brains that have to be removed by the Trainee.

The consensus was a minimum of 20 brains (20 adult and 20 pediatric). For spines, it was 5 adult with a mix of anterior / posterior approach. After the 20th brain, the resident notifies the attending staff for neuro autopsy on service that they need to observed/assessed for competency.

BRAIN DISSECTION WORKSHOP

- Occurs Tuesdays weekly.
- The neuropathology administrative assistant will type and distribute the list of cases for dissection.
- The neuropathologist will bring the brain cut folder to the Brain cutting suite in the morgue.
- The history and relevant imaging for the cases being cut should be reviewed in order to ensure that the maximum information is available.
- Photograph all significant externally abnormal brains and photograph significant pathology on the coronal cuts.
- Sampling of the nervous system for histology should be done on a problem solving basis.
- There is no standard series of blocks. However, there are a number of protocols associated with various research projects.
- Gross description of brain and other relevant neuropath material may be dictated.
- Inexperienced residents should type the prelim report (in a word document) and a consultative summary which should correlate clinical gross and neuropathological findings.

PRIMARY NEURO DISEASE

- Review the history and clinical details and then discuss them with the supervising neuropathologist in order that the maximum neuropathological information can be obtained from the autopsy.
- Dictate summary of history, clinical details, neurological findings and investigations.
- The resident then should remove the brain and carry out any other procedures determined in conjunction with the supervising neuropathologist.

The minimum sampling for a primary neuropath case should include:

- Removal of the brain, spinal cord
- Removal of several lumbar and cervical (PRG) Ganglia,

PRIMARY DISEASE ELSEWHERE/ RULE OUT PATH IN THE BRAIN

- Neuropathological significance is secondary to systemic disease
- Ensure no relevant neurological information is missed from the anatomical pathology resident on autopsy service's clinical summary and he/she may choose to remove the brain or at minimum be available to review the brain once it has been removed by the autopsy technician. Any required procedures other than removal of the brain and spinal cord must be performed by the Neuropathology resident.

ANATOMICAL DISSECTION

- Residents are encouraged select a normal brain from the Brain dissection cut list through discussion with the responsible neuropathologist for the case and dissect it to aid in the learning of neuroanatomy and overall technique.

RESIDENCY TRAINING IN NEUROPATHOLOGY

GRADED RESPONSIBILITY PGY 3&4

SCOPE: All residents enrolled in the Neuropathology Residency Training Program, University of Calgary.

PURPOSE: To outline the graded responsibility concept within the core years of Neuropathology Training PGY 3&4

OVERVIEW:
Graded Responsibility is the process by which a resident, during the course of their 5 years of training, not only obtains the knowledge and skills, but also the attitudes necessary to function as a competent specialist in Neuropathology.

While the requirements of different career paths may vary, this program seeks to ensure a core level of competence for all residents at the completion of their training in their capacities as diagnosticians, educators, administrators, and researchers. This is accomplished through the application of the Can MEDS Competencies.

Gradation of resident responsibility is commensurate with advancing levels of seniority in the autopsy and surgical pathology rotations. .

The training program is designed to initially equip residents with basic skills (eg. Gross dissection) and later, to expose them to more difficult and complex pathology through elective and advanced autopsy and surgical neuropathology rotations. A gradation of responsibility based on the faculty's evaluation of the residents' performance is thus effected.

It is critical that serious errors in diagnosis should **not** occur and institutional by-laws require that all pathology reports be signed by a staff pathologist. Thus the implementation of graded responsibility somewhat hampered, since the moral, ethical, and legal obligations of the staff pathologists must be accommodated.

By the time residents enter the neuropathology portion of their training they have already had one year experience in anatomical pathology and therefore have gained experience in surgical grossing, reviewing surgical and autopsy cases and writing up reports.

As they become familiar with the nature of neuropathology gross specimens they are allowed to gross surgical specimens on their own, with the proviso that if there should be any doubt as to the appropriate grossing of the specimen the staff on service should be consulted. Depending on the level of graded responsibility achieved: allowed to review surgical and autopsy cases prior to the staff looking at them. After review with the staff and the ordering and review of special stains, immunohistochemistry, etc. the appropriate report content is discussed and the residents write this up. This is then reviewed with the responsible staff.

As they become more competent, as determined by observation and review of their reports, they are allowed to review the case, order special studies on their own and even write up the final report without consulting the staff if they feel comfortable doing this. As per Calgary Lab Services policy, all cases can only be signed out by the neuropathology staff.

As they become more experienced, they achieve greater independence in autopsy neuropathology, including removal of the brain, dissection, and writing up reports; and they are expected to communicate intraoperative frozen section/smear reports to the neurosurgeons.

They provide teaching for clinical rotators and medical students.

Alberta Children's Hospital Brain Removal Procedure *UPDATED*

It is critical that our neuropathology residents get exposure and training in the removal of perinatal and paediatric brains.

Follow the below sequence/steps:

1. The pathologist at the ACH is made aware of a pending autopsy.

2. When the pathologist determines the time of the autopsy they have the neuropathology resident on autopsy service notified.
   - After hours the neuropathology resident on call for the surgical service should be called.
   - For all regular hours cases: The PGY 3-5 Neuropathology resident on autopsy service will be listed in the Department Duty ROTA which is circulated by the Clinical Section Head Administrative Assistant (Nipa Shah). Pager and contact information for all residents are provided on this document.

3. The neuropathology resident will respond ASAP to notify the paediatric pathologist as to whether they will attend.

4. If the neuropathology resident attends, they will perform the brain removal under whatever supervision is appropriate and will record their findings for inclusion in the "Internal Examination".

5. A searchable entry will be made on the autopsy form to record that the neuropathology resident has removed the brain. (If this is not possible, it should nevertheless be recorded in the CNS gross description and a log book will be provided for the resident to enter the case number and their attendance at the autopsy.)

NB: - There shall be no delay in any autopsies in order to accommodate the neuropathology resident.

- This should include *all* brains, even normal and macerated until such time as the resident has gained appropriate experience, at which time it may be limited to those of neuropathological interest. Competence at the skill is determined by the Neuropathology Staff and will be communicated to the resident.

- Residents are to use the below synopsis to document findings, pediatric pathologists will discuss using them too (complete at time of autopsy and leave for neuropathologist together with brain)

- The neuropathology resident will keep a record/log of brains removed

A synoptic guide could be as follows:

Artefacts: absent / present (specify): _____

Weight: _____ grams

Fresh tissue sampled for (specify site):

___EM : _____

___Brain Bank: _____

___Other: _____

Skull / Calvarium: normal /abnormal (specify):_____

Dura: normal /abnormal (specify):_____

Leptomeninges: translucent / congested / haemorrhagic / purulent / fibrotic: _____

Cerebrum: normal / abnormal (specify): _____

Olfactory tracts / chiasm: present / absent / abnormal (specify): _____

Optic tracts/chiasm: present / absent / abnormal (specify): _____

Pituitary fossa: normal /abnormal (specify): _____

Cerebellum: normal / abnormal (specify): _____

Brainstem: normal / abnormal (specify): _____

Spinal cord: normal/abnormal (specify)_____

Haemorrhages: absent / present (specify):_____

Masses: absent / present (specific): _____

Other: _____

PGY4 - Forensic Neuropathology Rotation Objectives

Definition

Forensic pathology is a subspecialty of Anatomic and General pathology which applies basic pathologic principles and methodologies to support the medico-legal and judicial systems in determining causes and manners of death, supporting the investigation of circumstances surrounding deaths, and assisting in the interpretation of postmortem findings of medical legal significance. The main role of a forensic pathologist is to formulate an opinion as to the cause and manner of death based on the postmortem interpretation of disease and injury to the human body, taking into consideration the history, circumstances and scene findings as a whole. The work undertaken may require testimony in court as an expert witness.

Background

The Office of the Chief Medical Examiner (OCME) is a branch within the Justice Services Division of the Ministry of Justice & Attorney General, Government of Alberta. Its area of jurisdiction is the province of Alberta with a population of approximately 3.8 million.

The OCME is responsible for the investigation and certification of all deaths in Alberta caused by violence, as well as all unexplained and some unattended natural deaths in accordance with the Fatality Inquiries Act. It is managed from two regional offices - one located in Edmonton and the other in Calgary. The Chief Medical Examiner is based in Edmonton but regularly attends in Calgary. The Edmonton office administers all investigations in the northern part of the province while the Calgary office administers the geographic area south of a line extending from Jasper to Hobbema and down to Provost.

Within both offices are 3 - 4 Assistant Chief Medical Examiners. In Edmonton approximately 1700 deaths are examined in a year and in Calgary approximately 1500 deaths are examined a year. Approximately half of these examinations are external examinations. Homicide numbers vary year to year: 53-63 in Edmonton (2008-2010) and 24-53 in Calgary (2008-2010).

A histology laboratory is located in Calgary and a toxicology laboratory is located in Edmonton. Two PhD chemists direct the toxicology laboratory. The office staff comprises medical investigators (MIs), histology and toxicology technologists, mortuary technicians, a research officer, administrators and administrative support personnel.

Specific Objectives

Medical Expert

- Familiarization with the role and operation of the OCME in sudden death investigation
- Understand similarities and differences between hospital and forensic autopsies
- Understand the differences between Medical Examiner's and Coroner's systems
- Introduction to the differing laws and regulations in Canada in relation to death investigation between provinces
- Familiarization with the Fatality Inquiries Act and the Fatality Inquiries Regulations for the Province of

Alberta

- Understand the value, techniques and theory of death scene investigation as it applies to forensic neuropathology
- Introduction to the challenges of identification of human remains with particular reference to the use of fingerprinting, odontology, radiology and anthropology
- Perform a complete and appropriate assessment of a deceased individual (both adult and pediatric) with particular attention to the neuropathological aspects
- Learn dissection techniques in the autopsy room in both adult and pediatric autopsies including when to order appropriate ancillary studies such as histology, microbiology, toxicology, neuropathology, radiology, genetic studies, virology etc
- Familiarization with neuropathological autopsy findings in a variety of sudden natural and violent deaths
- Familiarization with the interpretation of neuropathological autopsy findings in the context of the history, circumstances and scene findings
- Familiarization with autopsy neuropathological histology
- Understand proper techniques and theory for collection and handling of toxicology specimens
- Understand proper techniques and theory for collection and handling of trace evidence in the course of a suspicious death autopsy
- Introduction to the concepts of forensic science relevant to forensic pathology e.g. toolmark analysis, blood stain analysis, entomology, forensic biology, forensic photography etc
- Introduction to the concept of external examination
- Understand how to properly certify cause and manner of death
- Understand mechanisms of death
- Introduction to the limits of a forensic autopsy i.e. questions that cannot be answered despite full autopsy
- Familiarization with the principles of physical violence and the effects this can have on a human body: including sharp force, blunt force, crush, asphyxia, firearms, blast, electrocution, heat, cold, toxin related, fire and water related injuries particularly as related to the nervous system
- Introduction to court room proceedings and presentation of evidence as an expert witness Forensic Pathologist
- Adequate preparation for the Forensic Pathology component of the RCPSC NP Examination

Communicator

- Develop rapport, trust and professional relationships with staff at the OCME, allied professionals and any members of the public such as relatives/friends of the deceased who are encountered during this rotation
- Demonstrate an understanding of the importance of timeliness, clarity and accuracy in all communications
- Convey effective oral and written information with regards case investigations in which you have the responsibility of producing an official autopsy report
- Introduction to the concept of ‘lay language reports’ when conveying complex scientific information

Collaborator

- Participate effectively and appropriately within the multidisciplinary team setting of medico-legal

death investigation
- Understand the role of the OCME in working with a diverse population with a multitude of religious, ethnic, cultural and personal beliefs surrounding death, the body of the dead, autopsy and the afterlife. In particular how these different beliefs may effect every stage of the death investigation
- Understand how different autopsy techniques may impact the later preparation of a body by a funeral home and subsequent viewing by relatives and friends of the deceased

Leader
- Introduction to the concept of team leadership by the forensic pathologist in the setting of a homicide investigation and team dynamics
- Understand and demonstrate the principles of quality assurance, quality control and quality improvement as it applies to forensic pathology
- Demonstrate effective personal time management with regards maximizing educational opportunities whilst at the OCME
- Manage workload appropriately to ensure timely completion of work

Health Advocate
- Understand and demonstrate an understanding of all necessary safety precautions in the autopsy room, laboratory and at death scenes with emphasis on both day to day casework and high risk autopsies
- Understand the role of the pathologist in ensuring the safety of all morgue staff and observers at autopsy
- Understand the concepts of public health as it applies to the work conducted at the OCME e.g. responding appropriately to the likes of infectious disease diagnoses, potential hereditary disease diagnoses, potential unsafe environments (e.g carbon monoxide leaks, work related fatalities, product design flaws, bioterrorism), death trends that may pose an immediate or emerging threat to the health of a population (e.g. adulterants to illicit drugs) and mass fatality events
- Understand how forensic pathology can promote the health of communities and populations through the study of mechanisms, causes and manners of death e.g. deaths in infancy, maternal deaths, deaths from epilepsy

Scholar
- Demonstrate continual learning through e.g. the process of reflective learning, the conduct of personal practice audits, the posing of appropriate learning questions, accessing journal articles relevant to work undertaken or witnessed, integrating new learning into practice, documenting and sharing this learning.
- Understand critical evaluation of information from its source and apply this appropriately in the workplace
- Actively participate in opportunities for learning by attending:
    - OCME Alberta Forensic Pathology Rounds: Thursday afternoons 1500 – 1600 hrs in both Edmonton and Calgary by videoconference
- Request appropriate personal professional feedback and provide effective feedback during the elective

Professional

- Assist in the provision of the highest quality of service that the OCME can provide to all Albertans with competency, integrity, honesty and respect
- Respect confidentially and privacy with regards any conversation about case work seen or conducted in the OCME particularly when outside the office and after the elective
- Recognition of professional limits and actively seek advice and assistance from senior staff members. A resident will never be made to conduct any procedures on any individuals that are felt to be out of their scope of experience, competence or comfort level.

Requirements

- Will be a PGY4 neuropathology resident prior to commencing a 4 week elective at the OCME although exceptions may be considered on a case per case basis.
- Are advised to bring in appropriate 'morgue footwear'. Scrubs, surgical gowns, plastic aprons, hair nets, eye shields and face masks are provided as well as cut-proof gloves, latex and latex free gloves are all provided in house.
- Are advised to ensure that all appropriate vaccinations are up to date prior to attending at the OCME for their rotation.
- Should aim to complete in the region of 20 full neuropathological examinations (non homicides) and will only ever be invited to undertake an examination on a decomposed individual.
- Are expected to complete the communication notes in the OCME database MEDIC when they complete their autopsies in a timely fashion (preferably immediately after autopsy)
- Are expected to discuss the cause and manner of death immediately after autopsy with the supervising medical examiner although the certificate will be signed by the supervising medical examiner
- Residents are responsible for writing up the official autopsy report for their cases into the OCME database MEDIC with guidance from the supervising medical examiner and on the agreed departmental template in a timely fashion (preferably within a day or two after autopsy)
- Are expected to follow through and review and discuss toxicology, histology and other ancillary investigation results as they pertain to the case they completed whilst still at the OCME.
- Should request to attend at court cases where the Chief or an Assistant Chief Medical Examiner is providing testimony
- Should request to spend at least an hour with the Chief or an Assistant Chief Medical Examiner to discuss the proper method for completing a death certificate
- Residents are asked to hold their building access card with the appropriate level of responsibility and care as would be expected of a rotating resident and return the aforementioned access card at the end of the elective.
- Residents are requested that they do not remove any data (paper, digital, microscope slide or other) from the department.
- Residents are reminded in particular not to discuss the circumstantial or autopsy information learnt regarding homicide cases outside of the department as this may be critical privileged information relevant to criminal proceedings.

Evaluation

Evaluation of progress through the elective will include:

- On going day to day evaluation
- An informal mid –way point one to one with the rotation preceptor (This should allow for adequate time during the rotation to address any perceived exposure/training deficits or deficiencies in performance)
- End of rotation written in-house exam during final week or rotation
- End of rotation PowerPoint presentation on a topic to be decided in-rotation with preceptor.
- End of rotation formal evaluation through One 45 in the form of an ITER (In-Training-Evaluation-Report)

Suggested Reading

1. Dolinak D et al. *Forensic Pathology: Principles & Practice*. Chapter 23. 2005. Academic Press
2. Itabashi HH et al. *Forensic Neuropathology: A Practical Review of the Fundamentals*. 2007. Academic Press
3. Whitwell. *Forensic Neuropathology*. 2005. CRC Press
4. *Academic Forensic Pathology* (journal). Volume 2 Issue 1: Neuropathology. March 2012.
5. Troncoso JC. *Essential Forensic Neuropathology*. 2010. Walters Kluwer
6. Leestma JE. *Forensic Neuropathology.* 2014. CRC Press

Further Reading

1. Spitz W U et al. *Spitz and Fisher's Medicolegal Investigation of Death 4th Edition.* 2006. Charles C Thomas Publisher.
2. *Basic Competencies in Forensic Pathology. A Forensic Pathology Primer*. 2006. College of American Pathologists.
3. Di Maio VJ, Di Maio D. *Forensic Pathology 2nd Edition*. 2001. CRC Press
4. Dolinak et al. *Medicolegal Neuropathology: A Color Atlas*. 2002. CRC Press
5. Saukko P, Knight B. *Knight's Forensic Pathology 3rd Edition*. 2004. Arnold Publishing
6. Froede RC. *Handbook of Forensic Pathology 2nd Edition*. 2003. College of American Pathologists.
7. Ludwig J. *Handbook of Autopsy Practice 3rd Edition*. 2002. Humana Press
8. Burton E C et al. *Religions and the autopsy*. Medscape Reference Article [http://emedicine.medscape.com/article/1705993-overview]
9. Di Maio VJM. *Gunshot Wounds 2nd Edition*. 1999. CRC Press.
10. Saferstein R. Criminalistics: *An Introduction to Forensic Science 9th Edition*. 2006. Prentice Hall.
11. Payne-James J et al. *Forensic Medicine. Clinical and Pathological Aspects*. 2003. Greenwich Medical Media.
12. Pounder D.J. *Lecture Notes in Forensic Medicine*. Accessible online [http://www.dundee.ac.uk/forensicmedicine/notes/notes.html]
13. Cummings PM et al. *Atlas of Forensic Histopathology*. 2011. Cambridge University Press.
14. Oehmichen M et al. *Forensic Neuropathology and Associated Neurology*. 2009. Springer-Verlag
15. Karch SB. *Karch's Pathology of Drug Abuse*. 2009. CRC Press.

16. Busuttil A & Keeling JW. *Paediatric Forensic Medicine & Pathology*. 2009. Edward Arnold.

PGY4 - Molecular Pathology Rotation Objectives

Site:	Molecular Pathology Laboratory
Preceptors:	Robert Hay (Laboratory Scientist) and Dr. D. J. Demetrick
Length of Rotation:	1 week

Outline of rotation:
The molecular pathology block will take place at the Section of Molecular Pathology, Calgary Laboratory Services (CLS). As molecular diagnostic services are distributed between numerous laboratories within CLS, the Molecular Pathology elective is short, and focuses solely on tests performed within the Molecular Pathology laboratory. As CLS does not provide much of the equipment utilized for the performance of these assays, by necessity, part of the elective time will necessitate using equipment within the Demetrick research laboratory.

The resident will learn the indications and principles of some of most widely used diagnostic molecular tests including T-cell and B-cell gene rearrangement studies for the diagnosis of lymphoproliferative disorders, detection of aberrant fusion genes in solid neoplasms, detection of gain or loss of genomic material in cancer specimens, and genetic comparison of specimens to establish specimen identity. The resident will become familiar with a variety of different techniques in performing these studies, and will understand their advantages and limitations. The resident will review all results generated daily from the laboratory. He/she will obtain experience in performing the polymerase chain reaction (PCR) assays. The resident also will learn the principles and techniques used to prevent contamination within a diagnostic molecular laboratory.

General Objectives:
At the completion of training, the resident will have acquired the following competencies and will function effectively in the following CanMEDSs roles:

1. Understand the basic principles, advantages, and limitations of various molecular diagnostic techniques commonly used in diagnostic molecular pathology laboratory including:
    a. Nucleic acid isolation and purification from blood/fluids/tissue
    b. Polymerase chain reaction (PCR)-based assay
    c. In situ hybridization including FISH and CISH

2. Be familiar with the common clinical applications of these techniques:
    a. Diagnosis (Establishment of clonality in lymphoid cells, sub-classification of lymphoma by translocation analysis, classification of soft tissue tumors, classification of brain tumors, evaluation of potential specimen tissue contamination, evaluation of potential specimen misidentification)
    b. Quality control/assurance in molecular pathology

3. Ensure that reports are generated in a timely and accurate fashion for optimal patient management/treatment

4. Demonstrate the ability to advise on the appropriateness of obtaining samples for molecular studies.

5. Participate effectively and appropriately in an interprofessional health care team

6. Effectively work with other health professionals to prevent, negotiate, and resolve interprofessional conflict.

Specific Objectives:

Medical Expert

1. Understand human genomic organization and the expression of genetic information to functional molecules, including proteins and regulatory RNA molecules
2. Understand the principles of nucleic acid testing.
3. Understand the concepts of nucleic acid hybridization, amplification and dideoxy nucleotide sequencing (Sanger)

4. Understand the principles, advantages and limitations of polymerase chain reaction (PCR) assays
    a. Be familiar with the set up of PCR reactions
    b. Be familiar with the common clinical applications of PCR based assays including translocation, mutation and polymorphism testing.
    c. Be familiar with the latest technologies in detecting and/or quantifying PCR products, and their clinical applications
5. Be familiar with other non-PCR based molecular techniques (such as chromogenic in situ hybridization) that are commonly used in molecular diagnostic laboratory
6. Understand the issue of contamination in a molecular diagnostic laboratory, and measures taken to minimize contamination
7. Understand the design considerations of a molecular diagnostic laboratory
8. Understand the current and potential role of molecular diagnosis in maintaining wellness, disease detection, accurate and early diagnosis, predicting progression and predicting clinical response to treatment

Communicator

1. Communicate effectively and demonstrate caring and respectful behavior when interacting with medical colleagues, nursing and technical staff
2. Obtain and discuss appropriate information with staff pathologists and clinicians in difficult cases
3. Accurately convey relevant information and explanations to colleagues and other professionals
4. Seek to educate colleagues and other health care providers as to the role of molecular pathology in improving the diagnosis, care and cost-effectiveness of the care of patients

Collaborator

1. Work as a part of a multidisciplinary team in the management and treatment of patients
2. Demonstrate a commitment to their patients, profession, and society through participation in profession-led regulation

Leader

1. Utilize time and resources effectively to balance patient care, budget restrictions,
2. professional expectations and personal life
3. Allocate finite health care and health education resources effectively to optimize patient care and life-long learning
4. Demonstrate knowledge of the methods of quality control in a molecular pathology lab
5. Participate in activities that contribute to the effectiveness of their healthcare organizations and systems
6. Manage their practice and career effectively
7. Allocate finite healthcare resources appropriately
8. Serve in administration and leadership roles, as appropriate

Health Advocate

1. Recognize how technological advances in molecular biology may apply to improvement in diagnostic pathology
2. Respond to individual patient health needs and issues as part of patient care
3. Respond to the health needs of the communities that they serve
4. Identify the determinants of health of the populations that they serve
5. Promote the health of individual patients, communities and populations
6. Acquire appropriate QA/QC knowledge to ensure patient safety and accuracy of medical reports

Scholar

1. Develop and implement a personal continuing educational strategy
2. Apply the principles of critical appraisal to sources of medical information
3. Contribute to the development of new knowledge through research
4. Participate in rounds, conferences and teaching sessions when applicable.
5. Maintain and enhance professional activities through ongoing learning
6. Critically evaluate information and its sources, and apply this appropriately to practice decisions
7. Facilitate the learning of patients, families, students, residents, other health professionals, the public, and others, as appropriate
8. Contribute to the creation, dissemination, application, and translation of new medical knowledge and practices

Professional

1. Deliver the highest quality of care with integrity, honesty and compassion
2. Practice medicine in an ethical manner and with a sensitivity to diverse patient populations
3. Exhibit appropriate professional behavior and perform duties in a dependable and responsible manner
4. Demonstrate commitment to excellence and ongoing professional development
5. Demonstrate a commitment to their patients, profession, and society through ethical practice

Educational Program

1. Time allocation:
    a. Reading time 2-4 hours per day
    b. Performing or assisting in diagnostic procedures 2-4 hours per day
    c. Discussion and interpretation of results 2 hours per day

2. Recommended reading from Molecular Diagnostics for the Clinical Laboratorian 2nd Edition. William B. Coleman and Gregory J. Tsongalis Editors. The recommended readings listed here are good starting points for an introduction into molecular diagnostics. The listed references at the end of each chapter allow for a deeper investigation into each topic and are excellent sources of information. The trainees must familiarize themselves with the appropriate benchtop technique prior to observing it.
    a. Molecular biology and nucleic acid biochemistry theory –. Chapter 2
    b. Setup of the Molecular Diagnostic Laboratory (Leonard)
    c. Extraction of DNA from clinical samples – Chapter 3
    d. The Polymerase Chain Reaction – Chapter 5
    e. PCR for detection of Clonal Rearrangements in Lymphoma – Chapter 32

3. Benchtop Technical Curriculum (desired but dependent on assays performed that particular week).
    a. Observe nucleic acid extraction and purification process
    b. Observe nucleic acid quantitation process
    c. Observe PCR assay setup, thermal cycler programming and amplicon detection
    d. Observe Lightcycler assay set up, programming and data analysis
    e. Observe Microsatellite marker analysis
    f. Observe ISH (denaturation/hybridization step and evaluation of staining)
    g. Observe interpretation and reporting of test results performed the week of the elective.

4. Interpretation of Results (dependent on assays observed previously)
    a. IgH Rearrangement
    b. TCR Rearrangement
    c. Bcl-2 Translocation
    d. Bcl-1 Translocation
    e. EBER
    f. Microsatellite Identity Testing
    g. Somatic Hypermutation

Educational Materials

(all of these books are available in the Molecular Pathology Laboratory)

1. Molecular Diagnostics for the Clinical Laboratorian. 2nd Edition. William B. Coleman and Gregory J. Tsongalis, Editors.
2. Diagnostic Molecular Pathology. Debra G. Leonard. Saunders. 2003.
3. Genes IX. Benjamin Lewin. 2007.

Evaluation

1. Satisfactory completion of this elective will depend on appropriate attendance at technical procedure demonstrations, as well as appropriate background reading as judged by either the Lab Scientist, Molecular Pathology or the Section Head, Molecular Pathology.

2. An In-training Evaluation Report (ITER) will be completed.

Comment:
These objectives were harmonized with those from the Molecular Pathology Laboratory at the University of Alberta.

Last Modified: January 2009

PGY4 – Neuropath Cytology Rotation Objectives

Definition
Cytopathology is that branch of medicine specializing in diagnosis through the evaluation of the cellular manifestation of disease.

Background
At the University of Calgary all Cytopathology is centralized at the Diagnostic & Scientific Centre (DSC), the core laboratory facility located in the University Research Park at 3535 Research Road NW, Calgary. Consolidation was completed in May 2004. In September 2006, CLS changed all gynecological cytology processing to Liquid-based Cytology (LBC) using ThinPrep Cytyc (Hologic) technology. Automation was implemented in early 2007 for pre-screening using the ThinPrep Imaging system. At the start of the rotation, trainees meet with the Section Head of Cytopathology to discuss goals and objectives. Thereafter, they work with the cytopathologist assigned to the service for that day. All non-gynecological specimens including those pertaining to the Nervous system, such as cerebrospinal fluid (CSF) or sometimes fine needle aspiration (FNA) of spinal / intracranial lesions are processed using the LBC method.

General Objectives:
On the completion of this rotation, the Trainee will achieve competency in the cytological manifestations of common diseases and be able to diagnose common disease processes that present in non-gynecological cytopathology, with an emphasis on the evaluation of specimens pertaining to the nervous system.

Specific Objectives:

Medical Expert

1) Understand the principles of cytologic diagnosis
2) Understand the basic principles of cell biology and pathogenesis, and the cytological changes that occur in disease states
3) Demonstrate knowledge of methods for acquiring specimens by exfoliative or fine needle aspiration techniques
4) Demonstrate knowledge of specimen fixation, processing, staining, and slide screening procedures
5) Demonstrate knowledge of and skill in identifying and classifying the appearance of normal cells sampled by exfoliative or fine needle aspiration techniques
6) Demonstrate knowledge of and skill in identifying and classifying the cytologic appearance of common neoplastic, pre-neoplastic, and non-neoplastic diseases sampled by exfoliative or fine needle aspiration techniques
7) Demonstrate knowledge of the criteria for satisfactory and unsatisfactory specimens
8) Demonstrate knowledge of the indications, use, and limitations of ancillary techniques as an aid to diagnosis

Communicator

1) Act as a Consultant to clinical colleagues in the interpretation and relevance of cytologic findings with particular regard to their significance in the management of the patient
2) Demonstrate understanding and awareness of the importance of timeliness, clarity, and accuracy in all communications
3) Formulate comprehensive and clinically meaningful reports and be able to communicate reports effectively in both oral and written form.

Collaborator

1) The Trainee must know the value of multi-disciplinary collaboration in patient management decisions
2) Demonstrate the ability to advise on the appropriateness of obtaining cytologic specimens and following examination of these, to advise on further appropriate investigations

Leader

1) Demonstrate knowledge of the principles of quality control, quality assurance, and quality improvement in a Cytopathology laboratory

Health Advocate

1) Understand the need to ensure that Cytopathology practices and test selection are regularly monitored and evaluated to determine that they meet the needs of the community

Scholar

1) Critically appraise sources of medical education

Professional

1) Deliver highest quality of care with integrity, honesty, and compassion
2) Demonstrate a professional attitude to colleagues, students, other health professionals and laboratory support staff
3) Have an appreciation of their own limitations as a medical expert and know the necessity of seeking appropriate second opinions

Duration: 2 weeks

Evaluation
Performance will be evaluated at the completion of the rotation. Evaluation will be carried out by the Rotation Supervisor, teaching Cytotechnologists, and members of the Cytopathology Medical Staff by the completion of an ITER.

The end of rotation evaluation will include a 1-hour exam focused to relevant topics for a neuropathology resident – csf, other fluids, head and neck – 20 - 25 cases.

Additional exams and slide reviews as determined by cytopathologists or Section Head.

Procedure
From the commencement of the rotation, the Trainee will be expected to prepare a report on some non-gynecological cases of the day. These will then be signed out with the attending Cytopathologist(s) of the day.

Whatever free time remains should be spent in independent study and review of the teaching file. The Trainee will be excused for the Training Programs Educational half day. The rest of the time is to be spent in the Cytopathology rotation. Any absences must be discussed with the Rotation Supervisor.

Attendance at the Cytopathology CME sessions, teleconferences and Quality (QUPEC) Committee is recommended.

Rotation Supervisor: Dr. Marie Dvorakova or designated Cytopathologist on respective service for that day.

Mandatory tutorials:
During the rotation, tutorials in non-gynecologic cytopathology will be taught by arrangement with the teaching Cytotechnologists.

They will include the following topics:

Week 1	Body fluid cytology to include pleural, peritoneal and pericardial effusions, and pelvic washings. Head & Neck, Salivary glands,
Week 2	CSF

Throughout the tutorial weeks, the Trainee will receive slide quizzes based on material that has been covered. Emphasis will be given to areas of difficulty. The Trainee will be required to screen the slide fully, mark any cells of concern and interpret the findings. The slide will then be reviewed and discussed by the teaching Cytotechnologist.

Teaching cytotechnologists:

The head is Rosemin Kara, but there are a selection of Cytotechnologists who take on the teaching duties.

Cytopathology Medical Staff:

Dr. Máire Duggan	Dr. Ranjit Waghray	Dr. Margaret Gorecki
Dr. Walid Mourad	Dr. Moosa Khalil	Dr. Anna Sienko
Dr. Yinong Wang	Dr. Marie Dvorakova	Dr. Tatjana Terzic
Dr. Steve Gorombey	Dr. Nicole Bures	Dr. Chen Gao
Dr. Ethan Flynn		

Research opportunity and other CME sessions:

Trainees are recommended to attend any staff or guest lecture presentations pertaining to Cytopathology. These are well advertised within the department.

Trainees are encouraged to participate in clinical/basic science research in collaboration with staff. Slide sets, teleconferences and audio-video materials are available in the department for review.

Required reading and references:

A large selection of books and journals pertaining to cytopathology are held in the department. Additional copies of texts are available for use by Trainees. These must not be taken out of the department without express permission.

1) Comprehensive Cytopathology. Marluce Bibbo, 2nd Ed 1997, WB Saunders, Philadelphia, Pennsylvania, USA.
2) The Art and Science of Cytopathology. Richard DeMay, 2nd Ed 2012, American Society of Clinical Pathologists Press, Chicago, Illinois, USA.
3) Cytology, Diagnostic principles and clinical correlated. E. Cibas, B. Ducatman 4th Ed 2013.
4) Atlas of Diagnostic Cytopathology, B. Atkinson. Saunders 2004.
5) Modern Cytopathology, Geisinger et al. Churchill Livingstone 2004.
6) Differential Diagnosis in Cytopathology. Gattuso, Reddy, Masood. 2010
7) Journals – Diagnostic Cytopathology, Cancer Cytopathology, Acta Cytologica

Contact phone numbers:

Dr. Marie Dvorakova , Section Head, Cytopathology	403-770-3823
Cytotechnologists	403-770-3272

Neuropathology Cancer Cytogenetics Rotation – PGY-4

Overview

Clinical cytogenetics is the microscopic analysis of chromosomal abnormalities in individual cells and their relation to pathologic conditions. The site of this rotation will be the Calgary Laboratory Services Cancer Cytogenetics Laboratory, located at the Diagnostic & Scientific Centre (DSC) at 3535 Research Road NW in University Research Park. This laboratory performs chromosomal and fluorescent in situ hybridization (FISH) studies on blood, bone marrow, tumour tissue and lymph node specimens for cancer diagnosis.

Rotation Supervisor: Dr. Bob Agropolous

Length of Rotation: 2 weeks

Attendance: Given the short length of the rotation, vacation will not be granted during this rotation, except in extenuating circumstances. The trainee will be excused for the Neuropathology Academic ½ Day (typically held Thursday afternoons). Any absences must be discussed with the Rotation Supervisor.

Expectations: At the start of the rotation, the resident will meet with the Rotation Supervisor to discuss the goals and objectives for the rotation, and the daily expectations for the rotation. When not engaged in service work with the Cancer Cytogenetics laboratory staff, the trainee is expected to engage in independent reading around cancer cytogenetics. During the course of this rotation, the trainee will prepare a presentation for the members of the Neuropathology and Cytogenetics groups on a specific topic (of the resident's choosing) related to cancer cytogenetics of tumors of the nervous system based on the resident's learning during this rotation.

General Objectives

On the completion of this rotation, the trainee will achieve competency in the use of chromosomal and FISH studies for cancer diagnosis, with a focus on neoplasms pertaining to the nervous system.

Specific Objectives

At the end of this rotation the neuropathology resident will:

Medical Expert

- Describe the role of cytogenetic testing in cancer diagnosis and treatment, integrating best evidence and practices
- Understand the techniques used in cytogenetics, including but not limited to: karyotype analysis, polymerase chain reaction, fluorescent in situ hybridization, comparative genomic hybridization.
- Appreciate the diagnostic and prognostic utility, including sensitivity and specificity, of particular cytogenetic tests in relation to tumors of the nervous system, eg. 1p19q codeletion, MYC amplification

Be familiar with the basic evaluation of fluorescent in situ hybridization (FISH) assays

- Know the specimen requirements for various cytogenetic tests (amount of tissue required; type of tissue eg. touch preps, fresh, frozen, formalin fixed, paraffin embedded)

- Understand the limitations of testing procedures related to tissue processing and fixatives, e.g. frozen vs. formalin fixed tissue vs. paraffin-embedded tissues

- Understand the effect of delay of submission of tissue, particularly fresh, on various forms of tests regarding RNA, DNA analyses, karyotyping and other cytogenetic tests

- Demonstrate insight into one's own limitations of expertise and seek appropriate consultation as necessary

Communicator

- Accurately elicit and synthesize the relevant clinical information for a particular cytogenetic test

- Convey effective oral and written information about the results of a cytogenetic test

- Understand the wording of cytogenetic reports with regards to clarity of communication of information to the ordering physician

- Understand the wording of cytogenetic reports with regards to the clinical interpretation of cytogenetic findings

- Understand when direct dialogue with the ordering physician is necessary

Collaborator

- Participate effectively with the professional and technical staff of the Cancer Cytogenetics Laboratory, and interact with them in an appropriate and professional manner

- Understand the different roles and responsibilities of the team members within the cytogenetics laboratory

- Understand the role of the consulting neuropathologist with the cytogenetics laboratory when requesting testing

- Demonstrate safe handover of patient care information, both verbal and written, when transitioning a case to another healthcare professional

Leader

- Appreciate the costs of various cytogenetic tests and utilize the most cost-effective test for a particular study

- Understand the pros and cons of different procedures if different tests are available to detect the same abnormality

- Appreciate new techniques in cytogenetics that are presently not clinically approved and how these may be utilized in patient care

- Appreciate the times involved for various procedures and the turnaround times for various tests

- Understand the key principles of assay development and validation as they apply to fluorescence in situ hybridization

- Understand the key principles of quality assurance and quality control as they apply to the cytogenetics laboratory

Health Advocate

- Understand the impact of results on the patient and patient's family and, if applicable, to the population at large

- Understand the impact of turnaround times on patient care

- Appreciate when alternative testing to that ordered by the requesting physician is appropriate and how to communicate this

- Understand how to advocate for the introduction of new tests that will positively affect patient care

Scholar

- Using case encounters during this rotation to inform learning, search and review the published literature that pertain to key elements of cases that are sent for cytogenetic testing to address gaps in knowledge or require further investigation

- Create and implement a process to keep up to date with new developments in cytogenetics as relevant to the practice of neuropathology, and maintain this knowledge for future use

- Critically appraise the value of a particular test in a particular

clinical setting, using the principles of evidence-based medicine

- Participate in clinical rounds and continuing medical education events and personally research questions that arise from these activities to maintain ingoing learning

- Facilitate the learning of members of the health care team in regards to the role of cytogenetic testing in the diagnosis and management of tumours of the nervous system

Professional

- Exhibit appropriate professional behaviors in practice, including honesty, integrity, commitment, compassion, respect and altruism

- Demonstrate a commitment to delivery in the highest quality care and maintenance of competence

- Demonstrate a commitment to patient safety and quality improvement.

- Know when it is necessary to get informed patient consent for a particular cytogenetic test

Evaluation:

Performance will be evaluated at the completion of the rotation. Evaluation will be carried out by the Rotation Supervisor by completion of an ITER, with input from the professional and technical staff of the Cancer Cytogenetics Laboratory.

Recommended Reading and References

(forthcoming)

Contact Information:

Dr. Bob Agropolous 403-770-3547

fariborz.kolvear@cls.ab.ca Cancer Cytogenetics Laboratory 403-770-3690

Revised by the RPC July 23, 2017, pending review by Cytogenetics

RESIDENCY TRAINING IN NEUROPATHOLOGY

Chief Resident in Neuropathology

Senior residents (PGY 3-5) rotate through the role of chief resident for the Neuropathology program. As outlined below, the chief resident position addresses many of the CanMeds roles, especially the non-medical expert competencies.

Per the PARA contract, a pay supplement is provided to chief residents; if more than one resident has served in this role over the year, the supplement is prorated for the time spent in this role.

The performance of the chief resident is periodically assessed by staff pathologists and resident rotators through evaluations on one45.

Medical Expert:

- ✓ Available as an additional resource for junior neuropathology residents and rotating residents with respect to the performance of proper grossing techniques, the performance of intra-operative frozen sections and smears, and the diagnostic work-up of surgical and autopsy cases.

Communicator:

- ✓ Responsible for effectively communicating and discussing resident concerns regarding the Neuropathology residency program at the Neuropathology Residency Program Committee (RPC) meetings.
- ✓ Develop teaching skills through interactions with junior and rotating residents during their rotations in Neuropathology.

Collaborator:

- ✓ Available to junior neuropathology residents and rotating residents to answer questions about the diagnostic workup of surgical and autopsy cases.
- ✓ Work with the RPC to make improvements to the program and ensure that resident issues are followed up appropriately.
- ✓ Assist in the resolution of concerns and mediate conflict within the resident group and between residents and support staff, administrative staff and professional staff, through the RPC or directly with the Program Director, where appropriate.

Leader:

- ✓ Responsible for the orientation of new residents (junior neuropathology residents and rotating residents) with regard to departmental structure, policies and procedures, and the use of manuals.
- ✓ Responsible for creating the Neuropathology resident rotation and call schedule (created twice a year). *Note: once the Neuropathology resident schedule is created, individual residents are responsible for working with the program administrator to ensure any changes to their schedule are appropriately documented, and communicated to those in charge of departmental monthly rota and call schedules.*
- ✓ Liase with the Program Director and Program Administrator regarding resident issues, as needed.
- ✓ Act as a general resource for the resident group, including rotating residents, with respect to day-to-day function in the laboratory, and facilitate attendance at clinical and teaching rounds.
- ✓ Participate in the Neuropathology Section staff meetings and assist in the communication of any relevant issues or policy changes to the resident group.
- ✓ Assist with the organization and setup of audiovisual equipment for academic 1/2-day didactic lectures and other Neuropathology resident lectures as needed.
- ✓ Request new books or equipment for the Neuropathology Resident Room as needed.
- ✓ Have the opportunity to attend departmental meetings such as the AP/Cyto Planning and Operations meetings and QA meetings as an observer.
- ✓ Liase with the Anatomical Pathology chief resident to ensure that the occurrence of Anatomical Pathology sessions relevant to Neuropathology residents, such as the Lab Management / Quality Assurance sessions, are communicated to the Neuropathology resident group and to facilitate their involvement in these sessions.

Health Advocate:

- ✓ Be available as a peer resource for other members of the resident group with regards to resident well-being, and facilitate access to additional resources.
- ✓ Encourage a collegial work environment in the resident room.

Scholar:

- ✓ Engage in teaching and assessment of medical students during their elective Neuropathology rotations.
- ✓ Engage in the teaching of junior Neuropathology and rotating residents during their Neuropathology rotations.
- ✓ Actively participate in undergraduate teaching sessions, such as being a small group leader for the Neuroanatomy lab sessions at the medical school.
- ✓ Be involved in the organization of resident teaching materials, such as topical glass slide teaching sets.

Professional:

- ✓ Represent the Neuropathology residents on the Residency Program Committee and divisional meetings as required.
- ✓ Assist the Program Director and Program Administrator in ensuring the Neuropathology residency training manual is current and distributed to new residents.
- ✓ Provide an orientation to junior residents and rotating residents at the start of their rotations, including:
    - orientation and tour of the department of pathology
    - facilitate introductions to divisional staff
    - orientation to rotation responsibilities, weekly schedule and mandatory rounds
    - demonstrate proper use of a light microscope and photographic equipment
    - demonstrate proper autopsy and surgical dissection techniques
- ✓ Be involved in the interview and selection process of new residents for the Neuropathology program.
- ✓ Be involved in the interview and selection process of new professional staff for the Neuropathology division.

PGY-5: RESEARCH/CLINICAL/ELECTIVE & LAB INFORMATICS

There will be one mandatory rotation in Lab Informatics with Dr. Chris Naugler during this year.

The remaining 12 blocks will be an optional year arranged between the trainee and the Program Director and approved by the Neuropathology Residency Program Committee (RPC).

The Trainee may elect to spend time in any combination of the following:

a) Diagnostic neuropathology

b) Research. This may involve:
- A clinical research topic supervised and edited by an identified neuropathologist.
- Basic research. Supervised by a staff neuropathologist. The project to be approved by the RpC.

c) Clinical Neuroscience or other specific off-site rotations as approved by the Neuropathology RPC and the Graduate Clinical Education Committee of the Faculty of Medicine

d) An additional year of Anatomic Pathology

e) Clinician Investigator Program www.ucalgary.ca/cip/about

RESIDENCY TRAINING IN NEUROPATHOLOGY

Diagnostic Neuropathology

Overview

In the fifth year Diagnostic Neuropathology selective, it is expected that the Trainee will demonstrate his/her ability to function as a practicing Neuropathologist under very limited supervision.

The resident may choose no more than four (4) Subspecialization Topics:

1. *Pediatric/Perinatal*
2. *Neoplasia*
3. *Muscle/Nerve*
4. *Neurodegenerative and/or Dementia*
5. *Ophthalmopathology*
6. *Forensic*
7. *Infectious*
8. *Vascular*
9. *Epilepsy*
10. *Others as approved by RPC*

} *Here or abroad*

Prerequisites: The resident will have a working knowledge of:

a. *Basic neurobiology, including neuroanatomy, neurophysiology, biochemistry, immunology, and cell biology.*
b. *Neuroembryology, especially how it relates to malformations of the nervous system.*
c. *Normal gross morphology as well as light microscopy of the central nervous system, peripheral nervous system, and skeletal muscle.*
d. *Pathogenic mechanisms of diseases that afflict the central, autonomic, and peripheral nervous systems, as well as skeletal muscle.*

Medical Expert:

1. The resident functions effectively as a neuropathologist, integrating all information to provide optimal diagnoses and medical care.

2. The resident effectively evaluates surgical pathology specimens, including: nervous system neoplasia, medical biopsies, muscle biopsies, and nerve biopsies
   a. Obtains and interprets pertinent clinical information relevant to analyzing the specimen, including keys aspects of the clinical history, salient neuroimaging, electrophysiology (EMG, NCS, and EEG), and laboratory data.
   b. Succinctly but adequately describes a gross specimen, especially larger resections of brain tissue.
   c. Effectively identifies salient microscopic findings and perspicaciously describes relevant aspects in the comment and/or synoptic report.
   d. Integrates all of the above key information to arrive at a correct diagnosis or provide limited and useful differential diagnoses.
   e. Orders additional pertinent prognostic testing or other studies required to confirm, refine, or clarify the diagnoses.
   f. When appropriate in the discussion, amalgamates the clinical and pathological findings with the pathophysiological disease mechanisms, including relevant references. Provide advice about further appropriate investigations.
   g. Utilizes synoptic reports and standard methods of quality assurance.

3. The resident effectively performs autopsies and evaluates autopsy specimens. The range of patient disorders includes, but is not limited to: dementias, inflammatory diseases, cerebrovascular diseases, white matter diseases nervous system trauma, paediatric diseases (including inherited diseases), and fetal diseases (including malformations and disorders of fetal development).
   a. Abstract a complete and detailed neurological history from the patient's chart or electronic medical records, summarize this information perspicaciously in the report, and use this information to guide the autopsy dissection, special testing on microscopic slides, and where appropriate, other relevant testing.
   b. Removes nervous system tissues, including brains, spinal cords, peripheral nerves, and muscles, as indicated by the

clinical information and as restricted by the autopsy permission.
c. Follows standard safe practices in performance of the autopsy, including use of relevant safety protection.
d. Examines, dissects, and describes the results of gross examinations in the context of the history, in order to integrate this information in the final report, to acquire appropriate microscopic blocks, and to order relevant tests.
e. Effectively examines and describes microscopic findings.
f. Integrates all relevant information into a succinct, perspicacious, timely, and clinically useful final pathology report.

4. The resident effectively and appropriately utilizes special methods of examining tissues by knowing their principles of operation, acquiring appropriate procedural skills related to the techniques, and interpreting the results of the testing into the final pathology report:
   a. Examines, interprets, and reports results on cerebrospinal fluid and cyst fluids from nervous system lesions
   b. Prepares and stains intraoperative smears and frozen sections on nervous system tissues, interprets the microscopic findings, and reports these results to operating room staff, in both oral and written formats
   c. Describes the principles of immunocytochemistry, interprets and incorporates results from this technique in examination of tissues, and participates in developing new antibodies and in immunoperoxidase quality assurance
   d. Describes the fundamental aspects of electron microscopy, uses this instrument to acquire images, and interprets these images in pathology reports
   e. Describes the principles of fluorescence microscopy and utilizes this technique in select cases
   f. Describes the principles of flow cytometry, orders this test in appropriate cases, and when appropriate incorporates the results in pathology reports
   g. Describes the principles of DNA in situ hybridization and fluorescent in situ hybridization, interprets results, and integrates the results into pathology reports
   h. Describes the principles of PCR and orders appropriate testing on select tissues, and be able integrate the results into pathology reports

5. The resident understands and can elucidate the biological principles behind select laboratory tests, including: the molecular pathogenesis of neoplasia and both its prognostic value and potential therapeutic utility; the deposition and anatomic distribution of aggregated proteins in neurodegenerative diseases; the cellular structure, protein composition, and architecture of muscle and nerve as they relate to disease; the biology of nervous system pathogens as it relates to diagnosis and prognosis

6. The resident effectively interacts with neuropathology laboratory staff to trouble shoot problems, help prioritize work, develop new tests, and participate in quality assurance.

7. Must demonstrate the ability to conduct a thorough and appropriate autopsy examination of the nervous system in the setting of a forensic post mortem. The ability to direct (a morgue technician) and/or personally conduct the processes required for complete brain, spinal cord and eye removal and examination should be demonstrated. The importance of the sequence of these processes with respect to children and adult autopsies in a forensic setting (particularly in relation to toxicology sampling) must be understood. The resident should be able to produce a written neuropathology report to a standard acceptable for presentation in court. The report should display knowledge of limitations and requirements in expressed opinions therein, specific to the nuances of forensic pathology. The resident should demonstrate the ability to select, conduct and interpret common additional postmortem investigations relevant to forensic autopsy work that may have implications for a final neuropathology report e.g. toxicology, relevant immunohistochemistry. The resident should demonstrate an understanding of current perspectives regarding the mechanics and autopsy findings in cases of violent deaths relevant to neuropathology in both adults and children.

Communicator & Health Advocate:

1. Convey effective oral and written information about a neuropathological examination to physicians, colleagues, and other professionals.

2. Communicate effectively with technical and other support staff in the laboratory.

3. Provide consultations to colleagues in pathology, neuropathology and other physicians.

4. Participate effectively in interdisciplinary rounds and meetings, including providing appropriate and effective presentations.

5. Respond to individual patient health care needs related to neuropathology by effectively managing their cases, advocating for appropriate testing, disseminating neuropathologic results in the form of reports, communicating results at meetings and presentations, and advocating for appropriate further investigations and therapies.

Collaborator & Leader**:**

1. Work effectively with other members of the neuropathology healthcare team, including clerical staff and laboratory technicians

2. Participate in neuropathology quality assurance and quality control.

3. Display appropriate time management skills.

4. Use knowledge of laboratory management structures and workload measurement to improve laboratory function.

5. Describe and practice safe laboratory techniques.

6. Know when to seek intra- and extra-departmental review of diagnostic material and how to appropriately intrgrate this into the report

Scholar:

1. Act as mentors for junior Neuropathology residents.

2. Educate residents (neurology, neurosurgery, paediatric neurology, others) rotating in Neuropathology.

3. Actively participate in medical student teaching (e.g. small group leader for the neuroanatomy lab sessions, running medical school tutorials, guiding medical student rotators).

4. Effectively acquire new and relevant information from scholarly sources, including textbooks and scholarly articles. Effectively use electronic search functions to obtain useful and accurate clinical and scientific information.

5. Critically evaluate information available in textbooks, lectures, and primary articles, to determine their accuracy, veracity, and utility. Sort the wheat from the chaff.

6. Contribute to resident and rotator teaching materials, including but not limited to: preparing of or adding to topical glass slide teaching sets, contributing and annotating slides for virtual microscopy, preparing electronic didactic presentations or summaries and making these available to other residents

7. Participate in scholarly work: Prepare articles for publication in scientific journals. Prepare and present scholarly work at “in house” seminars, local, national and international meetings.
8.
9. Continually enhance personal knowledge through continuing learning. Read sufficiently both in general and around specific cases to continually gain neuropathology knowledge.

Professional:

1. Demonstrate commitment to patients and the profession of Neuropathology.

2. Respond in a professional manner to issues related to neuropathology (e.g. conflicts, urgent situations, ethical issues and criticism).

3. Fulfill the role of a neuropathologist in providing adequate patient care. This includes the recognition of self limitations, limitations within the field of neuropathology, and the necessity of seeking appropriate second opinions.

Research

Although individualized to the resident's interest it is expected that the outcome of concentrated research time will be publication in a recognized scientific periodical

The resident will be assessed at regular intervals by his/her supervisor

Overview

If Research is chosen for the final year of training, it is expected that the Trainee will demonstrate his/her ability to function as a practicing Neuropathologist.

Philosophy

The research process is important for developing skills in critical thinking and in the interpretation of the published scientific literature. Involvement in research also serves the purpose of contributing to medical knowledge and in facilitating the career goals of the resident. The Royal College of Physicians and Surgeons General Standards of Accreditation require that the Department of Pathology have an active research program. This is evidenced by activities such as publications in peer-reviewed journals, involvement by staff and residents in current research projects, presentation of scientific work in public forums, etc.

Types of Research Projects

1) Clinical based project using archival and/or prospective case material
2) Methods development
3) Research designed to address issues of quality assurance
4) Experimental research

Publication of Research

Research projects should be sufficiently well designed, novel, etc., such that they have a reasonably high likelihood of acceptance in the peer-reviewed scientific literature. The resident should work with the supervisor to ensure that the research is written up in the format required by scientific journals and submitted for publication.

General Objectives

By the end of the residency program, the resident will be able to:

1. Conduct a thorough literature review using computerized databases.
2. Evaluate an article from a scientific journal using as criteria:
    a. Relevance of the topic to current practice
    b. Adequacy of the method of investigation including:
        i) Clarity of statement of the problem including the hypothesis to be tested
        ii) Selection of variables most amenable to study
        iii) Adequacy of method of selecting cases
        iv) Appropriateness of methods of data analysis and study design
        v) Validity and reliability of data
        vi) Precision of measurement
        vii) Identification of potential sources of bias
        viii) Adequacy of the discussion
        ix) Validity and generalizability of the conclusions
3. Design and execute a research project
4. Present original work in a public forum

Specific Objectives

Medical Expert:

- ✓ Hypothesis Generation:
    - Demonstrates the ability to clearly identify a focused area for research study

- Develop a clearly articulated research hypothesis in scientific terminology.

✓ Literature Review
- Provide a comprehensive review of the literature on areas relevant to the proposed research, accessing all available texts, journals and abstracts.

✓ Statistical Methods
- Demonstrate a clear understanding of research statistics including appropriate application and limitations

✓ Ethics
- Is highly cognizant of ethical aspects of research and considers these when designing the project

✓ Presentation Skills
- Demonstrates outstanding presentation skills
- Ability to translate scientific data into a format which is comprehensible to a diverse audience
- Has appropriate use of visual aides

✓ Reporting Skills
- Produce an outstanding document at the conclusion of research which describes hypothesis, methods, result.
- Comprehensive discussion of findings.

Communicator & Health Advocate:

✓ Communication with Patients
- Demonstrate the ability to easily make the study purpose , design and risks understandable to potential study patients

✓ Confidentiality
- Design a system which will protect confidentiality of patients enrolled in the study

Collaborator & Leader:

✓ Time Management
- Demonstrate skill in time management
- Adhere to self imposed deadlines
- Punctual for research meetings
- Organize schedule so that time is clearly allotted to research work

✓ Supervision of collaborators
- Provide supervision of personnel participating in projects
- Clarify areas of confusion for other collaborators
- Delegate tasks and ensure that all aspects of the research project are underway

Scholar:

- Learning Needs
  - Identify own learning needs
  - Show initiative to review literature or consult colleagues to expand knowledge relevant to research work
- Teaching Skills
  - Communicate research concepts relevant to the audience
  -

Professional:

✓ Reliability
- Punctual to meetings
- Show respect for other peoples time and effort

✓ Follow Through
- Demonstrate the ability to complete tasks before the assigned deadline

PGY5 - Laboratory Informatics Rotation

Overview

This elective is intended for residents in a laboratory medicine training program (anatomic or general pathology, hematopathology, medical biochemistry or medical microbiology). The rotation will serve as an introduction to laboratory informatics and will help prepare the resident to utilize informatics tools in teaching, research and quality assurance. The rotation will also assist the resident in meeting key and enabling competencies in all of the CanMEDS roles (as outlined below).

The rotation will involve extensive exposure to actual pathology informatics problems along with structured readings and didactic sessions on hospital LIS systems, quality assurance, statistics, telepathology, digital imaging and emerging technologies. The resident will have an opportunity to spend time with staff from the Calgary Laboratory Services quality and data management departments. Specific exposure to digital imaging slide scanner(s) will be arranged. The resident will also have the opportunity to work on a brief informatics related problem (depending on time available and resident interest and aptitude). The primary preceptor will be Dr. Christopher Naugler, section head of pathology informatics for Calgary Laboratory Services. Additional medical staff from the Division of Clinical Pathology at the University of Calgary as well as support staff will be utilized when appropriate. By the nature of the practical situations encountered, there will be broad applicability of the training to laboratory management/leadership in general. The rotation will be 4 weeks in length.

Specific Rotation Objectives

(Relevant CanMEDS objective in brackets)

At the completion of this rotation the resident will:

1. Understand the role of laboratory informatics in the documentation, storage and dissemination of laboratory data. *(Medical Expert, enabling competency 5.4: Appropriately document and disseminate information related to procedure performed and their outcomes)*.

2. Be able to describe the key technical components of pathology informatics including laboratory informatics systems, analyzer interfaces, regional and provincial data repositories and office electronic medical records *(Communicator, enabling competency 5.1: Maintain clear, accurate, and appropriate records (e.g. written or electronic)* of clinical encounters and plans).

3. Understand the role of laboratory informatics tools in integrating and disseminating laboratory and clinical data across disciplines (*Collaborator, enabling competency 1.4: Work with others to assess, plan, provide and integrate care for individual patients (or groups of patients))*.

4. Be able to apply laboratory informatics tools to the study of healthcare resource utilization *(Leader, key competency 3: Allocate finite healthcare resources appropriately)*.

5. Apply statistical techniques as part of an overall laboratory quality assurance and improvement strategy *(Leader, enabling competency 1.2: Participate in systemic quality process evaluation and improvement such as patient safety initiatives)*.

6. Be aware of the use of laboratory informatics in measuring pathologist workload as well as institutional and regional workforce planning *(Leader, enabling competency 1.4: Describe principles of healthcare financing, including physician remuneration, budgeting and organizational funding)*.

7. Be familiar with various software and hardware applications of laboratory informatics in patient care *(Leader, enabling competency 2.4: Employ information technology appropriately for patient care)*.

8. Gain practical experience in the use of laboratory informatics tools in the measurement of test utilization as well as techniques to relate this to overall population health *(Health Advocate, enabling competency 3.1: Identify the determinants of health of the populations, including barriers to access to care and resources)*.

9. Become familiar with the use of telepathology and digital slide scanning in teaching and clinical practice *(Scholar, key competency 4: Contribute to the creation, dissemination, application, and translation of new medical knowledge and practices)*.

10. Be aware of emerging laboratory informatics research tools including bioinformatics and computer modeling *(Scholar, enabling competency 4.4: Conduct a systematic search for evidence; 4.5: Select appropriate methods to address the question)*.

11. Understand the role of pathology informatics in maintaining and safeguarding patient records *(Professional, enabling competency 2.2: Fulfill the regulatory and legal obligations required of current practice)*

Christopher Naugler MD FRCPC 16 Oct 2010

RESIDENCY TRAINING IN NEUROPATHOLOGY

PGY5 – Lab Medicine Selective (other than Neuropathology)

Overview

In the fifth year Laboratory Medicine selective, it is expected that the Trainee will demonstrate his/her ability to function as a practicing pathologist under very limited supervision. This rotation may include Anatomic Pathology and any of its subspecialty rotations or other areas of Laboratory Medicine with the approval of the Residency Program Committee.

Medical Expert:

1. The resident functions effectively as a pathologist, integrating all information to provide optimal diagnoses and medical care.

2. The resident effectively evaluates pathology specimens:
   a. Obtains and interprets pertinent clinical information relevant to analyzing the specimen, including keys aspects of the clinical history, salient imaging, and laboratory data.
   b. Succinctly and adequately describes and appropriately samples a gross specimen
   c. Effectively identifies salient microscopic findings and describes relevant aspects in the pathology report.
   d. Integrates all of the above key information to arrive at a correct diagnosis and provide a limited and useful differential diagnoses if relevant.
   e. Orders additional pertinent prognostic testing or other studies required to confirm, refine, or clarify the diagnoses.
   f. When appropriate in the discussion, amalgamates the clinical and pathological findings with the pathophysiological disease mechanisms, including relevant references. Provide advice about further appropriate investigations.
   g. Utilizes synoptic reports and standard methods of quality assurance.

3. The resident effectively and appropriately utilizes special methods of examining tissues by knowing their principles of operation, acquiring appropriate procedural skills related to the techniques, and interpreting the results of the testing into the final pathology report, such as
   a. Describes the principles of immunohistochemistry, interprets and incorporates results from this technique in examination of tissues, and participates in developing new antibodies and in immunoperoxidase quality assurance
   b. Describes the fundamental aspects of electron microscopy, uses this instrument to acquire images, and interprets these images in pathology reports
   e. Describes the principles of fluorescence microscopy and utilize this technique in select cases
   f. Describes the principles of flow cytometry, orders this test in appropriate cases, and when appropriate incorporates the results in pathology reports
   g. Describes the principles of DNA in situ hybridization and fluorescent in situ hybridization, interprets results, and integrates the results into pathology reports

h. Describe the principles of PCR, and orders appropriate testing on select tissues, and be able o integrate the results into pathology reports

5. The resident effectively interacts with laboratory staff to trouble shoot problems, help prioritize work, develop new tests, and participate in quality assurance.

Communicator & Health Advocate:

1. Convey effective oral and written information about a pathological examination to physicians, colleagues, and other professionals.

2. Communicate effectively with technical and other support staff in the laboratory.

3. Provide consultations to colleagues in pathology and other physicians.

4. Participate effectively in interdisciplinary rounds and meetings, including providing appropriate and effective presentations.

5. Respond to individual patient health care needs related to pathology by effectively managing their cases, advocating for appropriate testing, disseminating pathologic results in the form of reports, communicating results at meetings and presentations, and advocating for appropriate further investigations and therapies.

Collaborator & Leader:

1. Work effectively with other members of the healthcare team, including clerical staff and laboratory technicians
2. Participate in pathology quality assurance and quality control.
3. Display appropriate time management skills.
4. Use knowledge of laboratory management structures and workload measurement to improve laboratory function.
5. Describe and practice safe laboratory techniques.
6. Know when to seek intra- and extra-departmental review of diagnostic material and how to appropriately integrate this into the report

Scholar:

1. Act as mentors for junior pathology residents.
2. Educate other resident trainees in laboratory medicine
3. Actively participate in medical student teaching guiding medical student rotators).
4. Effectively acquire new and relevant information from scholarly sources, including textbooks and scholarly articles. Effectively use electronic search functions to obtain useful and accurate clinical and scientific information.
5. Critically evaluate information available in textbooks, lectures, and primary articles, to determine their accuracy, veracity, and utility. Sort the wheat from the chaff.
6. Participate in scholarly works such as preparing articles for publication in scientific

journals.

7. Continually enhance personal knowledge through continuing learning. Read sufficiently both in general and around specific cases to continually gain pathology knowledge.

Professional:

1. Demonstrate commitment to patients and the profession of laboratory medicine.
2. Respond in a professional manner to issues related to pathology (e.g. conflicts, urgent situations, ethical issues and criticism).
3. Fulfill the role of a pathologist in providing adequate patient care. This includes the recognition of self limitations, limitations within the field of neuropathology, and the necessity of seeking appropriate second opinions.

Created: August 7, 2017.

LONGITUDINAL EXPERIENCES

LONGITUDINAL EXPERIENCE – Muscle and Nerve

Overview

Definition

Muscle and nerve are unique organs in the body because of their structure (both have extremely long constituents and muscle cells form a syncytium) and physiology. Neuromuscular pathology is a specialized field within neuropathology that requires a fundamental understanding of neuromuscular physiology as well as the pathological responses of these unique tissues to various types of injuries.

Background

Neuropathology residents learn about muscle and nerve pathology on a longitudinal basis. They have the opportunity to review all muscle and nerve pathology that is available in Calgary and workup a random sample of about half of these cases. The Neuropathology Section at Calgary Laboratory Services processes and diagnoses most of the muscle and nerve biopsies in Southern Alberta and all of those from Calgary hospitals, mainly from the Foothills Medical Centre, South Health Campus, and Alberta Children's Hospital. Residents learn about the basics of how to process both muscle biopsies and nerve biopsies and in a graded manner (i.e. straightforward cases early, complicated cases later) learn how to workup of these cases, prepare reports that include diagnoses, microscopic descriptions and pertinent comments, and frequently present the histopathology of these cases to neuromuscular clinicians.

Calgary has a very active and engaged neuromuscular community. This longitudinal rotation involves presenting salient histopathology on select biopsies at a monthly neuromuscular conference as well as presenting histopathology at occasional other rounds (e.g. neuromuscular grand rounds, rheumatology rounds, neurology grand rounds).

Neuromuscular diseases, their pathology, and the understanding of their pathophysiology has evolved rapidly over the last 25 years. Residents need to be able to seek out this evolving new knowledge and learn how to characterize new diseases or better confirm or characterize established diseases.

Specific Rotation Objectives:

Medical Expert

Muscle

1. Be able to process a fresh muscle biopsy, including snap-freezing in isopentane and retention of tissue for biochemistry and electron microscopy
2. Describe the key aspects of different muscle stains and histochemistry, including their constituents, their key principles of tissue contrast, and the specific pathological features that they accentuate or differentiate. Staining examples include: Gomori trichrome stain; PAS stain; ATPase histochemistry; NADH, SDH, and COX histochemistry; membrane attack complex and major histocompatibility complex immunoperoxidase stains; dystrophin and related immunoperoxidase stains; etc.
3. In specific biopsies, recognize and describe in a synoptic report muscle-specific histopathologic changes. Examples include: increased variability in myofiber size; increased internalized nuclei; split fibres; myophagocytosis; necrotic myofibers; inclusions; etc.
4. In specific biopsies, based on the clinical history and basic patterns of pathology on haematoxylin-eosin stains, order an appropriate panel of muscle stains.
5. In specific biopsies, recognize and describe in a synoptic report salient pathological features in different standard muscle stains and histochemistry. Examples include: ragged red fibres, rimmed vacuoles, and increased connective tissue in a Gomori trichrome stain; group atrophy, type predominance, and type grouping in ATPase histochemistry; etc.
6. In specific biopsies, based on the clinical history and pathological changes in standard panels of stains, suggest additional tests that would be appropriate on a muscle biopsy.
7. In specific biopsies, recognize and describe in a synoptic report salient pathological features in muscle electron microscopy. Examples include:
    a. Sarcolemmal changes - basal lamina, sarcolemma, subsarcolemmal glycogen
    b. Myofibril and associated cytoskeleton changes - loss, necrosis, hypercontraction, loss of I bands, loss of A bands, myofibril disorganization, ring fibres, structured and unstructured cores, minicores, target fibres,
    c. Z-line changes - Z-line streaming, duplicated Z-lines, nemaline rods, cytoplasmic bodies
    d. Intermediate filament changes - granulofilamentous material

e. Nuclear changes - clumped chromatin, nuclear rods, 16-18 nm filamentous inclusions (IBM), 8.5 nm filamentous inclusions (OPMD)
f. Mitochondrial changes - aggregation, lobular fibres, thick or ropey cristae, concentric cristae, parking lot inclusions, abnormal size
g. Membrane system changes - membrane-bound glycogen, excess lipid
h. Deposits and particles
i. Other structures
j. Capillary changes - tubuloreticular inclusions, basal lamina
k. Aggregation of filaments
l. Amyloid
m. Tubuloreticular inclusions
n. Tubulofilamentous inclusions (IBM)

8. In specific biopsies, based on the pathological findings and clinical information, classify the changes in a muscle biopsy into a major disease category.
9. Describe salient aspects of major disease categories, including clinical presentation, muscle biopsy features, testing, genetics, and prognoses:
   a. Denervation, including confirmatory testing
   b. Inflammatory or immune-mediated myopathy, including dermatomyositis, inclusion body myositis, immune-mediated necrotizing myopathy, and diseases subsumed under polymyositis
   c. Toxic myopathy
   d. Congenital muscular dystrophy, including the major categories (collagen 6, dystroglycan, merosin, nuclear envelop - lamin A/C)
   e. Congenital myopathy, including the major pattern categories (nemaline, fibre-type disproportion, central core, central nuclear / myotubular)
   f. Muscular dystrophy, including dystrophinopathy and associated disorders, limb girdle muscular dystrophies, Emery-Dreifuss muscular dystrophies, myotonic dystrophies, oculopharyngeal muscular dystrophy, and facioscapulohumeral muscular dystrophy
   g. Myofibrillar myopathy, including disorders of alpha-B-crystallin, desmin, filamin, myotilin, ZASP, and Bag3
   h. Distal myopathy
   i. Metabolic myopathy (including mitochondrial myopathy)
   j. Vacuolar or autophagic myopathy, including chloroquine myopathy, XMEA, Danon disease
10. Identify key genes involved in different forms of muscular dystrophies, congenital myopathies, and other inherited myopathies. Indicate either their structural or physiological function. With major genes, describe the range of pathological changes when the genes are mutated.
11. In specific biopsies, integrate the clinical history, basic patterns of muscle histopathology, results from special stains and histochemistry, and when appropriate results from electron microscopy to arrive at a diagnosis. Create an appropriate comment that integrates the clinical and pathological findings and communicates the results in a coherent manner. When appropriate, suggest possible genetic mutations or alterations that could produce the pattern of pathological changes identified in a muscle biopsy.

Nerve

1. Be able to process a fresh nerve biopsy, including retention of tissue for teased fibre preparations and electron microscopy. Processing needs to be done without incurring additional significant artefacts.
2. Describe the key features in a nerve biopsy that are visualized or accentuated by nerve special stains. Examples include: myelin stains and immunoperoxidase stains; axon stains and immunoperoxidase stains; inflammatory stains; etc.
3. Recognize and describe in a report nerve-specific histopathologic changes. Examples include: axon loss; loss of large or small myelinated axons; amyloid deposition; myelin ovoids; axonal spheroids; perivascular inflammation and fibrinoid vascular necrosis; etc.
4. Recognize and describe in a report salient pathological features in a “thick section” or “semithin” section stained with toluidine blue. Examples include: decreased density of axons or myelinated axons; axonal clusters; thinly myelinated axons; segmental or sectional loss of axons; onion bulbs; degenerate axons; biopsy or processing artefacts; etc.
5. Recognize and describe in a synoptic report salient pathological features in nerve electron microscopy. Examples include: onion bulb formation; axonal clusters; thinly myelinated axons; axonal degeneration or axonal spheroids; myelin degeneration or demyelination; Schwann cell inclusions; density and wrapping number of unmyelinated axons; amyloid deposition; reduplicated capillary basal lamina; etc.
6. Integrate the clinical history, basic patterns of nerve histopathology, results from special stains and histochemistry, and

when appropriate results from electron microscopy to arrive at a diagnosis. Create an appropriate comment that integrates the clinical and pathological findings and communicates the results in a coherent manner.

7. Identify key genes involved in different forms of inherited neuropathies, including both axonal and demyelinating neuropathies. When appropriate, suggest possible genetic mutations or alterations that could produce the pattern of pathological changes identified in a nerve biopsy.

Communicator

1. Prepare succinct and clear muscle and nerve biopsy reports that include pertinent clinical information, a diagnosis, a synoptic description, and a pertinent comment. Comments should how the available information was integrated into the diagnosis and when appropriate provide additional relevant information (e.g. genetic implications, type of inflammatory disease, possible aetiologies, etc).
2. In cases with surprising, unexpected, or critical findings, contact treating physicians with either preliminary or final results. Document such conversations in written reports. Examples include: inflammatory myositis; infectious diseases; vasculitis; toxic myopathies; etc.
3. Present histopathological and electron microscopic findings at various neuromuscular conferences.

Collaborator

1. When appropriate, consult with other neuropathology and neurology residents about findings in neuromuscular pathology cases.
2. When appropriate, consult with other neuropathology staff about neuromuscular findings in biopsies.
3. When required, contact physicians involved in a patient's care for additional clinical information and test results.
4. When appropriate, prepare and send muscle pathology cases to outside muscle consultants.

Leader

1. Based on provided information, calculate the total costs involved in a muscle biopsy and a nerve biopsy, including the biopsy procedure itself, processing of the muscle, muscle stains, electron microscopy, examining the biopsy and preparing the report, and external consultation.
2. Suggest tests that will differentiate among different differential diagnoses, while limiting extraneous testing.
3. Apply the important aspect of testing that two independent tests are much more supportive of a diagnosis than one test alone and balance this against the costs of additional testing.

Health Advocate

1. In reports and other communications with physicians, comment on the implications of the findings that relate to genetic diseases.
2. Suggest to clinicians additional clinical testing that might better sort out, confirm, or provide a more specific diagnosis, such as genetic testing, metabolic testing, and neuroimaging.
3. When clinical and/or pathological information is inconsistent, incompatible, or does not make sense, determine and suggest additional testing, possible diseases, or disease mechanisms that would better characterize the patient.

Scholar

1. Search neuromuscular literature in standard databases (e.g. PubMed) for information pertaining to active or current cases. Specifically seek and communicate information about:
   a. Practical techniques that could be used in current or recent cases to confirm or better characterize a diagnosis (e.g. new tests, application of old tests in new ways)
   b. Prognosis of new or better characterized diseases
   c. Features in neuromuscular biopsies that suggest new or modified diagnoses (e.g. necklace fibres in comparison to internalized nuclei).
2. Evaluate recent and old published neuromuscular literature for its specificity and accuracy. Apply this knowledge to current neuromuscular cases by including relevant information in neuromuscular pathology reports.
3. Assist clinicians in preparing pathology for publications on neuromuscular diseases.

Professional

1. Appropriately discuss and handle disagreements in muscle or nerve pathology, especially old cases that now have better diagnostics or in which previous testing was either not available or inadequate.
2. Alert treating physicians of salient changes to previously rendered diagnoses.

3. Discuss results of second reviews with the original pathologist or neuropathologist, especially when those reviews are at odds with their interpretations.

LONGITUDINAL EXPERIENCE – Paediatric Neuropathology

Overview

Definition

Paediatric neuropathology encompasses both diseases that are found in adults as well as diseases unique to foetuses, infants, children, and teenagers. Many paediatric diseases are rare, compared to those found in adults, and often only scant information is available on either the diseases or the pathology of those diseases. In addition, neuropathology in foetuses and young children require detailed knowledge of normal brain development and diseases that can affect that development.

Background

Neuropathology residents learn about paediatric neuropathology on a longitudinal basis. They have the opportunity to review all biopsies and many autopsies that are performed at Alberta Children's Hospital (ACH). During surgical pathology weeks, they review and write up all surgical neuropathology specimens from ACH and the occasional paediatric specimens from Foothills Medical Centre. During autopsy pathology weeks, they review and write up select ACH autopsy specimens.

In this rotation, neuropathology residents focus on four main areas: foetal autopsy neuropathology, autopsy neuropathology of infants, children, and teenagers, paediatric brain tumours, and epilepsy resections from paediatric patients. Other areas include rare biopsies for medical conditions that involve the brain or manifest in skin electron microscopy. Paediatric muscle and nerve pathology, while part of paediatric neuropathology, is discussed in a separate longitudinal rotation. Residents learn how to remove foetal and infant brains, how to work up paediatric tumours, how to work up epilepsy resections, and how to prepare reports that include diagnoses, microscopic descriptions and pertinent comments.

Specific Rotation Objectives:

Medical Expert

Paediatric Autopsy Neuropathology

1. Routinely remove foetal brains and spinal cords intact, including macerated specimens.
2. Routinely remove brains and spinal cords from autopsies on infants and children.
3. In metabolic and neuromuscular autopsies, remove and process nerve and muscle biopsies in a manner that would allow examination by routine muscle and nerve histology, electron microscopy, and both biochemical and molecular techniques.
4. Describe the succession of events involved in brain and spinal cord development, including key aspects of embryonic development, spinal cord development, brainstem and cerebellum development, development of the telencephalon, and the myelination sequence of these structures.
5. Identify how different pathological events impact the nervous system at different times of development, the nervous system's response to those injuries, and the later manifestations of these events. Examples include encephaloclastic lesions (e.g. porencephalic cysts, schizencephaly, polymicrogyria, and multicystic encephalopathy) and genetic or inherited developmental malformations (e.g. holoprosencephaly sequence, spinal cord dysraphism, cerebellar and brainstem malformations, Chiari I and II malformations, malformations of cortical development).
6. Prepare reports on a foetal nervous system autopsies and include diagnoses (with comments about foetal development), pertinent clinical information, gross and microscopic features, and a comment that helps explain the pathological findings in the clinical context. Considerations should include foetal age and brain development, and presence of infections, malformations and encephaloclastic lesions, hypoxic ischemic encephalopathy and correlations with placental pathology.
7. Prepare reports on infant and childhood nervous system autopsies, including key aspects of brain development, any aspects of brain pathology that contributed to the infant's or child's clinical symptoms or demise, and any systemic effects on the brain.

Paediatric Neoplastic Neuropathology

1. Identify the age ranges and locations of different paediatric tumours
2. Examine the neuroimaging on paediatric patients with brain tumours, identify the key features (e.g. location, free or fixed water content, enhancement, architecture, etc), create meaningful differential diagnoses, and use the imaging to assist in the final diagnosis.
3. Examine intraoperative smears and frozen sections on paediatric brain tumours, identify key features of the pathology, and formulate either a diagnosis or limited differential diagnoses.
4. Identify salient histologic features in a given tumour and generate differential diagnoses for those patterns of features.
5. Suggest or order immunoperoxidase stains, other stains, or molecular tests that could help differentiate and distinguish the different possible diagnoses. Be able to justify these stains, what they might show, and how they would limit the

possible diagnoses or confirm a diagnosis.
6. Prepare surgical pathology reports on paediatric brain tumours that include relevant clinical and neuroimaging aspects, tumour diagnosis and grade in a Final Integrated Report, relevant synoptic reports, and a comment that describes key aspects of the pathology relevant to the tumour diagnosis and grade.

Paediatric Epilepsy Neuropathology

1. Recognize and grade major changes that characterize hippocampal sclerosis. Prepare standardized surgical pathology reports of hippocampal sclerosis and include relevant grading information.
2. Identify different patterns of cortical dyslamination in an epilepsy resection and classify the pattern of focal cortical dysplasia according to recognized categories. Prepare surgical pathology reports on cases of cortical dysplasia.
3. Discuss the similarities and differences between cortical tubers and focal cortical dysplasia, including key aspects of their biology and molecular biology.
4. Identify inflammation and encephalitis in an epilepsy resection. Indicate its importance in relationship to Rasmussen's encephalitis.
5. Methodically photograph, dissect, sample, and provide histological diagnoses in large resections of cortex for epilepsy (hemimegalencephaly, Rasmussen's encephalitis, others).

Paediatric Muscle Pathology

1. See the Muscle and Nerve Longitudinal Rotation Objectives.

Communicator

1. Prepare succinct and clear foetal autopsy reports that include pertinent information about the pregnancy, placental pathology, and other clinical information, the neuropathological diagnosis or diagnoses (including information about the specimen adequacy and development), macroscopic and microscopic findings, and a comment that explains the diagnosis or relates the diagnosis to the clinical scenario.
2. Prepare succinct and clear infant, child, and teenager autopsy reports that include relevant clinical information, the neuropathological diagnosis or diagnoses, macroscopic and microscopic findings, and a comment that specifically comments on brain development, systemic disease effects on the brain, and possible brain-related causes of death.
3. Prepare succinct and clear reports on paediatric neoplasia than include relevant clinical information, neuroimaging features, neuropathology diagnosis and grade, and a clinically useful comment.
4. Present paediatric tumour pathology at Paediatric Neurooncology Rounds and discuss diagnostic features, grading criteria, and additional testing that was done or is suggested.
5. Present at other Alberta Children's Hospital Rounds, including Metabolic Rounds and Foetal and Perinatal Rounds.
6. Convey importance that molecular data has to inform diagnosis, especially in relationship to neoplastic neuropathology and genetic implications of muscle pathology

Collaborator

1. Follow established guidelines and seek second opinions from neuropathology staff on difficult muscle biopsies, epilepsy resections, and on all paediatric tumours.
2. When necessary contact physicians and surgeons involved in a patient's care for additional clinical information that is relevant to the pathological diagnosis (e.g. duration of symptoms in a tumour patient, age of seizure onset in an epilepsy resection).

Leader

1. Describe the procedures involved, costs, turn-around time, and technical limitations of additional tests, including molecular genetic testing, fluorescence in situ hybridization (FISH).

Health Advocate

1. In appropriate forums or settings, discuss uncertainties in diagnosis and how they might impact clinical categorizations and treatment categories. Examples include uncertainties in tumour grading, specific subtyping of a tumour, cortical dysplasia subclassification, ambiguous staining in a muscle, unusual ultrastructural features in a muscle, etc.
2. Be certain that treating physicians understand the pathological diagnosis and the limits of any diagnosis in predicting disease behaviour or response to therapy

Scholar

1. Search for classical or recent literature related to paediatric pathology by searching standard databases (e.g. PubMed), textbooks, and older references in more current publications. Evaluate this literature for its quality and utility in current practice. Key areas include:
   a. Foetal pathology - changes to foetal brain in response to hypoxic-anoxic injury, infections, and conditions that impinge on pregnancy.
   b. Brain and spinal cord malformations and developmental disorders.
   c. Metabolic diseases of childhood
   d. Neurodegenerative diseases of childhood
   e. Paediatric brain tumour molecular biology
2. Assist clinicians in preparing pathology for publications on paediatric diseases.

Professional

1. Discuss with neuropathology staff how to deal with inadequate or inappropriately handled surgical specimens (too small, sampling artefacts, cautery artefacts) and indicate how such deficiencies should be addressed.
2. Discuss results of second reviews or reviews of intraoperative diagnoses with the original pathologist or neuropathologist, especially when those reviews differ from the original interpretations.

LONGITUDINAL EXPERIENCE – Forensic Neuropathology Consult Service

Overview

Definition

Forensic neuropathology encompasses the evaluation of the tissues of the central and peripheral nervous system in cases with medicolegal implications. Specifically it is the aspect of neuropathology that focuses on the relationship between the interpretation of disease and injuries of the nervous system and their contributions to the cause and manner of death. Examples of cases in which forensic neuropathologists are typically involved in consultation include cases with known or suspected traumatic injury (accidental or homicidal), cases in which an individual dies suddenly from a natural disease which may have affected or originated from the central nervous system, and cases in which individuals have a known history of a neurological condition such as dementia or epilepsy.

Background

Neuropathology residents gain experience in forensic neuropathology on a rotational and longitudinal basis. Trainees complete two one-month rotations in forensic pathology at the Office of the Chief Medical Examiner (OCME) with one in PGY-2 and one in PGY-4. In addition, neuropathology residents are exposed to forensic neuropathology in a longitudinal fashion during the PGY3/4 years through the consultative work the Neuropathology Service provides to the OCME. Residents are required to attend all OCME dissections that are held at the Foothills Medical Centre when feasible, and in a graded fashion assist with the examination and reporting of these cases.

Given the sensitive nature and potential medicolegal implications of certain types of cases, residents will not be responsible for completing neuropathological consultative examinations / reports on homicides or suspicious child deaths.

Specific Objectives

Medical Expert:

- ✓ Familiarization with the role of the consultant neuropathologist on medicolegal cases, including the presentation of evidence as an expert witness and the concept of providing an opinion based on reasonable medical certainty / probability
- ✓ Perform an effective, appropriate and timely forensic neuropathological consultation that is independently reviewable, including:
  - Dissection and sampling of tissue specimens
  - Satisfactory gross and microscopic description of tissues
  - Specimen collection for ancillary studies as needed
  - Documentation of pertinent positive and negative gross and microscopic findings in an independently-reviewable fashion
  - Presentation of well-documented assessments in written and/or verbal form
- ✓ Apply knowledge of normal neuroanatomy, neurophysiology, post-mortem changes and basic neuropathological principles to forensic neuropathology cases
- ✓ Familiarization with the interpretation of neuropathological findings in the context of the history, circumstances, scene findings and systemic autopsy findings of the case
- ✓ Understand cause and mechanisms of death
- ✓ Familiarization with the principles of physical forces and their effects on the nervous system
- ✓ Understand the limitations of forensic neuropathology examination i.e. questions that cannot be answered despite detailed neuropathological examination
- ✓ Describe the role of neuroimaging in the investigation and diagnosis of diseases and injury of the nervous system
- ✓ Demonstrate medical expertise and knowledge relevant to situations other than patient care, such as providing expert legal testimony or advising governments on matters relevant to Neuropathology
- ✓ Identify and appropriately respond to relevant ethical issues arising in Neuropathology practice, including management and retention of specimens
- ✓ Demonstrate the ability to prioritize professional duties effectively and appropriately

Communicator:

- ✓ Demonstrate an understanding of the importance of timeliness, clarity and accuracy in all communications
- ✓ Convey oral and written communications effectively in cases in which you have the responsibility of producing a forensic neuropathology consultation report
- ✓ Understand the concept of 'lay language reports' when conveying complex scientific evidence

Collaborator:

- ✓ Work collaboratively with the individual(s) requesting the consult and when necessary seek out additional information through communication with the OCME (or other consulting individual) relevant to the pathological diagnosis, such as medical history, scene and circumstances of death, and findings at systemic autopsy
- ✓ Follow established guidelines and seek second opinions from neuropathology staff on difficult cases

Leader

- ✓ Manage workload appropriately to ensure timely completion of work
- ✓ Select medically appropriate investigative methods in a resource effective and ethical manner

Health Advocate

- ✓ Understand the concept of public health as it applies to forensic neuropathology, including communicable diseases, potential hereditary disease diagnoses, death trends that may pose and immediate or emerging threat to the health of a population
- ✓ Understand how forensic neuropathology can promote the health of communities through the study of mechanisms, causes and manners of death

Scholar:

- ✓ Demonstrate continual learning through the process of reflective learning, posing of appropriate learning questions, accessing journal articles relevant to work undertaken or observed, integrating new learning into practice and sharing this learning
- ✓ Be able to critically evaluate scientific information from its source and apply this information appropriately to current case work
- ✓ Search for classical or recent literature related to forensic neuropathology that pertains to active or current cases. Key topics should include:
    - Sudden unexpected death in epilepsy
    - Sudden unexpected death in infancy
    - Pediatric head trauma, including the current state of knowledge regarding 'shaken baby syndrome', significance of retinal hemorrhages, and the role for examination of the spine
    - Retinal hemorrhages and their significance
    - Role of postmortem neuroradiology
    - Diffuse axonal injury

Professional:

- ✓ Assist in the delivery of Neuropathology consultations with the highest quality of service and with competency, integrity, honesty and respect
- ✓ Respect confidentiality and privacy with regards to critically privileged information relevant to criminal proceedings that may be learnt through involvement in the Forensic Neuropathology consult cases, specifically any circumstantial or autopsy information regarding homicide and suspicious cases and including any and all written or electronic communications regarding the cases and photographic documentation of pathologic findings either from systemic autopsy or neuropathological information
- ✓ Understand the concept of 'chain of custody' regarding the handling of tissues in consultation, and maintain this during consultative casework.
- ✓ Recognition of one's own professional limits and actively seeking advice and assistance from neuropathology staff. A resident will never be asked to perform a consultative examination that is felt to be out of their scope of experience, competence or comfort level.

LONGITUDINAL EXPERIENCE – Non-Medical Expert Roles

CanMEDs roles: Communicator, Collaborator, Health Advocate, Professional and Scholar

Purpose: To monitor and evaluate the quantity and quality of the non-medical expert experiences encountered by the resident.

Required: An electronic journal will be kept by the resident documenting the activities engaged in that would be encompassed by these roles.

Evaluation: The journal will be submitted for review no less than annually to the Program Director or the Assistant Program Director for review and a copy kept by the Program for documentation purposes.

Sample:

https://www.dropbox.com/s/l8ijvrleqxnio6l/MASTER%20COPY%20Perpetual%20neuropathology%20Log%20book.xlsx?dl=0

LONGITUDINAL EXPERIENCE – QUALITY ASSURANCE

THE LEADER ROLE

Laboratory management is an important skill for pathology residents to develop during their training. Skills in time management, laboratory administration, leadership, informatics and quality control/assurance are best taught by practical hands-on exposure and the pathologists are encouraged to discuss and give the residents opportunities to build on these skills during their daily interactions in the laboratory.

During orientation blocks (blocks 1 in the PGY-1 and PGY-2 years), residents attend practical sessions in the organizational structure of a large lab, laboratory safety, histopathology and immunohistochemical techniques. Neuropathology residents at all levels attend and present at the laboratory management / quality assurance "Personal Learning Projects" sessions organized by the Anatomic Pathology program as part of their academic 1/2 day. These sessions are held every 3-4 months and involve residents presenting and discussing relevant topics, with guidance provided by a staff pathologist in attendance. The detailed list of topics, is appended. Over a 5-year period, it is expected each topic will be covered at least once.

With regards to quality control, the residents attend a weekly Neuropathology slide session (an accredited Type 1 learning activity by the Royal College of Physicians and Surgeons of Canada) in which they are actively involved with the neuropathologists in a discussion of routine, interesting and difficult cases. Residents are also involved in trouble-shooting issues relating to tissue processing and staining, and frozen section-final diagnosis correlation as they arise on a day-to-day basis.

Residents have the opportunity to participate in committee work. Given the small nature of our program, all residents attend the Neuropathology Residency Program Committee meetings (and Neuropathology Section Meetings). Opportunities are also available for residents to attend meetings such as the AP/Cytology Operations and Safety meetings, and residents routinely participate in the interviewing of CARMs candidates and new staff applicants.

The Chief Resident role is shared among the senior residents (PGY 3&4) in our program. As Chief Resident, the resident is expected to provide orientation and guidance to elective medical students and off-service residents rotating through Neuropathology, and trouble-shoot resident issues as they arise on a day-to-day basis. See the Objectives for the Chief Resident in Neuropathology document earlier in this manual.

An elective in Lab Informatics is available at the Diagnostic & Scientific Centre through Dr. Naugler, with exposure to a variety of topics related to quality assurance, quality control and informatics.

Residents at all years are encouraged to attend workshops organized by the PGME office that address the role of Leader, including: Conflict and Communication, Disclosing Unanticipated Medical Outcomes, Medical-Legal Modules and Financial Management.

LONGITUDINAL EXPERIENCE – PERSONAL LEARNING PROJECTS (PLPs)

Over the five year training period, each topic should be able to be covered at least once. A detailed list of the questions/topics is as follows:

Quality Assurance

1. What is the ISO 15189 standard for medical laboratories and what are the main components of this standard?
2. Outline the major categories used by the College of Physicians and Surgeons of Alberta (CPSA) in accreditation of an Anatomic Pathology Laboratory.
3. What are the components of a CPSA on-site laboratory accreditation?
4. Describe the essential components of a quality assurance program in surgical pathology.
5. Describe the essential components of a quality assurance program in autopsy pathology.
6. Discuss the components of quality control and quality assurance in a diagnostic immunohistochemistry laboratory.
7. Discuss the principles of root cause analysis and the role of root cause analysis in investigation of incidents/errors in Neuropathology.
8. Discuss the role of intra- and extra-departmental review of pathology diagnostic material (second opinion).
9. Classify addendum reports and give an example of each type.
10. Discuss the concept of "critical values" in anatomic pathology.
11. What are the recommended retention guidelines for specimens and documents in Anatomic Pathology?
12. Discuss the essential components of "safety" in an Anatomic Pathology laboratory.
13. Discuss the role of synoptic reporting as a quality assurance tool.

Laboratory Management

1. Draw an organizational chart for the Division of Anatomic Pathology and Cytopathology.
2. How is workload measured in Neuropathology
3. What are the components of an annual performance appraisal for pathologist staff?
4. Discuss how you would prepare for and conduct an interview for a laboratory technical employee or supervisor.
5. Discuss how you would handle the following management/human resources issues:
    a. Complaint from technologist regarding harassment by pathologist
    b. Concern raised by pathologist regarding diagnostic competency of a colleague
    c. Complaint from a resident that a pathologist is not answering pager while on call
    d. Resident concerns that a pathologist is refusing to engage in designated microscope teaching
6. What are the basic concepts underlying Lean production methods, and how can these methods be applied to an Neuro Pathology laboratory?
7. Prepare a major equipment request (MER) for:
    a. an automated special stainer (histochemistry)
    b. a replacement pathologist microscope
8. Write a sample 5-year strategic plan for the Section of Neuropathology.

Laboratory Informatics

1. Discuss the costs and benefits of pathology informatics to the patient and to society.
2. From the perspective of Neuropathology, discuss the selection criteria for choosing a new laboratory information system.
3. Your laboratory, in concert with the health region, is about to implement electronic reporting of anatomic pathology results directly to the patients' hospital chart and, for outpatients, to clinic/physician electronic medical records (EMRs). What quality assurance processes must be in place prior to the go live date?
4. Discuss the components of digital imaging including image acquisition, manipulation, and storage.
5. Discuss available resources for clinical decision support.
6. Discuss the role of telepathology in Neuropathology.
7. Discuss the advantages and disadvantages of voice recognition technology in pathology.
8. What are the advantages of adopting the LOINC coding system for medical terminology?
9. Discuss the role of ICD and SNOMED coding in laboratory informatics?

LONGITUDINAL EXPERIENCE – JOURNAL CLUB

Background

A small group learning activity for University of Calgary Neuropathology Residents, rotating residents and medical students participating in elective opportunities in Neuropathology.

A journal Club meeting will be held at least quarterly, and will take place during academic half day throughout the academic year. The goal of journal club is to educate residents in critical appraisal to enable them to accurately interpret the literature. The papers are predominantly original articles; however review articles may be chosen in special circumstances.

A maximum of two articles will be selected from the current literature one month prior to journal club, and a senior resident will be responsible for leading the discussion. A staff person will be designated as a resource for each journal club based on topic or availability.

Record of the article chosen, responsible resident and staff, and major discussion points will be kept by the Program.

Objectives:

- To provide an opportunity for peer-assisted review of recent publications that pertain to the practice of Neuropathology
- To provide an opportunity for Neuropathology Residents to succinctly present methodology, results, and interpretations of journal articles in order to develop oral communication skills
- To provide an opportunity to practice critical appraisal
- To assist participants in keeping up to date on recent advances in the field of Neuropathology

When:

3:30 - 4:00pm on the third Thursday of the 3rd month every quarter.

Format:

Small group learning session

All members shall be assigned on a rotating basis non-overlapping journal titles that pertain to the practice of Neuropathology. The rotating schedule will be distributed by the senior/chief resident, program administrator or equivalent.

Each member is responsible for selecting 1 recent publication. That member is responsible for reading the article prior to the session in order to present a summary and critical appraisal of the publication to fellow members during the session.

At least 25% of each journal club shall be allocated for discussion and interactive learning.

Facilitation:
The member presenting will be responsible for facilitating the discussion regarding the article.

The senior/chief resident (or designate) will be responsible for facilitating the overall session ensuring that all members are given the opportunity to present their articles.

The senior/chief resident (or designate) will be responsible for securing a location for the journal club session.

Record-keeping:
All members shall be responsible to provide a copy of the first page and/or abstract of their publication to the senior/chief resident and he/she shall be responsible for collecting these copies and submitting them to the Program Administrator for documentation purposes.

Evaluation:
A standardized evaluation tool (One45) will be used to evaluate each journal club.

Review:
The terms of reference shall be reviewed annually or as needed.

LONGITUDINAL EXPERIENCE – LABORATORY MANAGEMENT

In order to further fulfil the Royal College requirements regarding the role of Leader. It was determined by the Neuropathology Residency Program Committee that the following exercise be completed no less than ONCE in your residency).

Outline: To cost one complex surgical, one muscle, one complex autopsy (such as Alzheimer's disease or Parkinson's disease) each no less than once during residency.

Required: Each assignment should include the following:

- Costs for materials, salary and time:
  - Each stain
  - Immunological label
  - Molecular genetic studies
  - EM
  - Flow Cytometry
  - And, any others as they arise in the course of investigation

- Summation and justification for each investigation on clinical, teaching or research grounds.

Format: Costs will be listed and submitted as an itemized invoice. Summation and justification will be in a supporting document of no less than 250 words.

Evaluation:
The assignment will be submitted to the Program Administrator to be scanned and filed for the permanent resident record and given to either the Program Director or the Assistant Program Director for grading.

Direct feedback shall be written on a separate grading sheet; the final marked up documents will be scanned for the resident file and all originals returned to the resident.

LONGITUDINAL EXPERIENCE - RESEARCH

Philosophy

The research process is important for developing skills in critical thinking and in the interpretation of the published scientific literature. Involvement in research also serves the purpose of contributing to medical knowledge and in facilitating the career goals of the resident. The Royal College of Physicians and Surgeons General Standards of Accreditation require that the Department of Pathology have an active research program. This is evidenced by activities such as publications in peer-reviewed journals, involvement by staff and residents in current research projects, presentation of scientific work in public forums, etc.

RESEARCH:

After the first 3 months, the resident is required to undertake a research project. They are expected to identify a supervisor and/or research project.

The research project should be completed in time to present at the Residents' and Graduate Students' Research Day, 12 months later and, hopefully, at a National or International pathology meeting, 9 months later.

In practice, residents are expected to present at the Canadian Association of Neuropathologists meeting and/or any other appropriate annual scholarly meeting.

Initially, the supervisor is expected to provide appropriate direction. In time, the resident should demonstrate greater initiative.

The resident is responsible for ensuring the timely progress of the project, being aware of the abstract deadline dates, composing at least the first draft of the abstract, and generating the presentation materials.

With supervision, they are expected to compose the first draft of the manuscript.

Objectives

By the end of the residency program, the resident will be able to:

1. Conduct a thorough literature review using computerized databases.
2. Evaluate an article from a scientific journal using as criteria:
    a. Relevance of the topic to current practice
    b. Adequacy of the method of investigation including:
    c. Clarity of statement of the problem including the hypothesis to be tested
    d. Selection of variables most amenable to study
    e. Adequacy of method of selecting cases
    f. Appropriateness of methods of data analysis and study design
    g. Validity and reliability of data
    h. Precision of measurement
    i. Identification of potential sources of bias
    j. Adequacy of the discussion
    k. Validity and generalizability of the conclusions
3. Design and execute a research project
4. Present original work in a public forum

Types of Research Projects

1. Clinical based project using archival and/or prospective case material

2. Methods development
3. Research designed to address issues of quality assurance
4. Experimental research

Publication of Research

Research projects should be sufficiently well designed, novel, etc., such that they have a reasonably high likelihood of acceptance in the peer-reviewed scientific literature. The resident should work with the supervisor to ensure that the research is written up in the format required by scientific journals and submitted for publication.

Resident Research Coordinator Neuropathology

Dr. Jennifer Chan jawchan@ucalgary.ca

General:

Reporting to the Neuropathology Residency Program Committee (RPC), the Resident Research Coordinator, a faculty member in the Department of Pathology and Laboratory Medicine, assists and mentors pathology residents in all matters related to resident research. The ultimate goals are to elevate the quality of research, and to increase the level of accountability related to resident research activity.

Specific Roles and Responsibilities:

1. Meet regularly with residents as a group (minimum 2 x per year) to discuss research-related opportunities, topics, concerns etc.
2. Provide one-on-one mentoring to residents regarding research activities, including first-responder for residents having difficulty finding/starting research projects.
3. Maintain updated list of research interests/activities of each faculty member.
4. Maintain updated database of resident research activity, and monitor research outcomes (abstracts, peer reviewed publications, etc).
5. Review/approve (along with the Program Director and/or RTC) written funding requests for resident research projects
6. Provide academic and organizational assistance for resident and graduate student research day.
7. In collaboration with RTC, approve in-house and external research electives and assist RTC with evaluations of these electives.
8. Review the terms of reference on an annual basis.

Term: The position is appointed by the RPC, in consultation with the Department Head. The term is three years, and is renewable.

Report: A report (written or verbal) will be presented to the RPC twice per year.

Research Proposals, Process, and Funding

Research Proposals

Research proposals are required for all resident projects, and are limited to 5 pages. The proposal should contain the following subheadings:

1. *Specific aims*

These should be concise, in point form. It is reasonable to include the hypothesis to be tested in conjunction with the specific aims.

2. *Background and significance*

This should comprise a concise literature review of the area such that a reviewer could be reassured that the resident is aware of what others have done and can understand the rationale or thinking behind the proposed research.

3. *Preliminary data*

If preliminary data is available, this should be included here. It is probably a good plan to conduct a small pilot project before embarking on a full research proposal. A pilot project should show that the project is technically feasible and that there is a high likelihood of success.

4. *Methods*

This should include an overview of the experimental design and specific protocols corresponding to the specific aims mentioned above. Special attention should be given to the number of cases/experiments required to answer the scientific question(s), controls that will be used and the method(s) for data analysis. Laboratory techniques and procedures can be briefly mentioned unless they are of an innovative nature.

5. *Ethical considerations*

These should be addressed in detail and appropriate ethics review and approval obtained.

6. *Budget*

These items should be developed using the guidelines established by the department.

Research Process

1. A research proposal may be initiated at any time during the year.
2. Identify an area of research that is of interest to you. Contact a staff member with expertise in that area and determine if they are willing to supervise your project.
3. A preliminary outline of the research proposal should be submitted to the Resident's Research Coordinator for review and feedback, the latter of which will be provided in a maximum of one month. The purpose of the review process is to enhance and facilitate the research by providing constructive criticism and suggestions.
4. Following approval by the Research Coordinator, the resident should complete a CLS Application for Internally Supported Research (RE#7118; available on the CLS iWeb), and submit it to the AP APL Research Department at APResearch@albertaprecisionlabs.ca and they will review the application for completeness, and will then send it on to the CLS AP Divisional Research Committee. Once the project is approved, a Research Number (RS-YR-###) will be issued. The RS# is then to be used on all future communication related to the project.

External Funding for Resident/Fellow Research Projects

Definition: Resident research projects must involve the Anatomic Pathology resident/fellow in a primary investigator or major co-investigator role. The resident/fellow must be first or senior author on any abstracts or publications arising from the research project.

1. Calgary Laboratory Services (CLS) supports the technical costs of approved resident/fellow research projects including:
    a. Data retrieval from laboratory information system
    b. Block/slide retrieval from on-site storage

c. Block/slide retrieval from off-site storage (Iron Mountain) to a maximum of 30 cases (pilot project or proof-of-principle)
d. Slide cutting and staining, including special stains available in house
e. Immunohistochemistry (IHC) available in house (CLS IHC Laboratory)
f. Molecular testing available in house

2. Resident research projects may occasionally have associated costs that are not covered by CLS, for example:
    a. Chart retrieval from medical records
    b. Block/slide retrieval from Iron Mountain in excess of 30 cases
    c. IHC, including new antibodies and method development for tests not on the CLS menu, (Anatomic Pathology Research Laboratory)
    d. Molecular testing not on CLS test menu
    e. Statistical support
    f. Database development/support
    g. Capital equipment costs
    h. Publication costs

3. To cover costs associated with #2 above, a resident/fellow and his/her staff research supervisor may apply to the Neuropathology Residency Program Committee (RPC) for additional funding support.
    a. The maximum additional funding awarded per request is $5,000.
    b. The total funding available per year is $10,000 (subject to change dependent on annual budget)
    c. A resident or a staff supervisor can apply only once per calendar year (April 1 – March 31)
    d. A copy of the approved Application for Internally Supported Research application (CLS Form RE#7118), with attached Research Project Cost Summary, must be submitted to the RPC, with justification for the additional funding request
    e. The NP Resident must be intimately involved in the research project and must be first or senior author on any presentations or publications arising from the research work.
    f. Projects will be funded on a first-come, first-served basis effective April 1, each year.
    g. If total funds requested are more than available, then funding per project will be decreased accordingly, as decided by the Chair of the NP Research Committee/or designate and the RPC.
    h. Funding decisions made by the RPC are final. There is no appeals process.

Resident Research Day

The Department of Pathology and Laboratory Medicine at the University of Calgary holds an Annual Research Day. All Anatomical Pathology, Neuropathology residents beyond the PGY1 year are expected to present. Research Day includes presentations not only by pathology residents, but also by fellows, graduate students, medical students, and even technologists associated with the division of Anatomical Pathology.

Research Day, more than just being a competition, provides residents with an opportunity to be trained and evaluated in the scholarly aspects of physician competency. Research Day not only allows the department to internally comment on the design and presentation of a resident's research, but these projects form the starting point of subsequent educational travel, a highly valuable ancillary educational activity made available to residents doing original research. The Research Day is currently held in the late spring.

Our department takes great pride in our Annual Research Day, which has been a centrepiece in our program for over twenty years. Money for Research Day comes from multiple sources including the CLS Resident's Budget, PGME, and from the Paul Kneafsey Memorial Fund. Research Day includes a guest speaker who delivers the Paul Kneafsey Memorial Lecture, and who also acts as the primary adjudicator for the Research Day competition. The Research Day events are thus two days of activities including the visit by the selected guest speaker, various educational and social activities attended by that person, and the Research Day itself. At the end of Research Day, an Awards Banquet is held to celebrate the achievement of all residents and to declare the winners of the competition.

The Research Day Awards include:

- ✓ Outstanding Clinical Research ($500.00),
- ✓ Outstanding Basic Science Research (Dr. Anna Kossakowska Award) ($500.00)
- ✓ Honourable Mention Award in either the Clinical or Basic Science category ($250.00).
- ✓ In addition, a $250.00 prize is awarded to the Best Poster presentation (provided 2 or more are entered).

The Awards Banquet also provides an opportunity to present a number of additional Awards, including:

- ✓ Outstanding Achievement in Teaching by a Resident,
- ✓ Teacher of the Year Award (Staff),
- ✓ Outstanding Support Staff Award (Resident Appreciation Award),
- ✓ Sandra Skrober Award
- ✓ "Black Crow" Award. (Retired)
- ✓ Kristy Ells Memorial Award for Outstanding Performance at Autopsy.

Details on all of the Awards are provided in the following pages. In addition, the Banquet offers residents and staff an informal and relaxed environment in which to relax, socialize, share ideas, and otherwise get to know one another.

Research Day and Banquet

All Residents at the PGY2 - PGY5 level are expected to participate in Research Day. In addition, Research Day entries are also open to Graduate Students, Fellows, Medical/Laboratory Students, and Technicians from the Department of Pathology and Laboratory Medicine. The work presented must be original, and must be based on work undertaken predominantly in Calgary. The presenter must be a major contributor to the work. While most of the Residents in Anatomical Pathology will be expected to deliver a platform presentation, entry into the poster competition is also acceptable. Residents may choose to enter a platform presentation AND a poster, if desired.

Abstracts are generally due 3 weeks before Research Day, and Abstract Guidelines will be distributed well before-hand. Guidelines must be adhered to strictly to warrant consideration for acceptance. All Research Day presentations (poster and platform) are eligible for awards, unless the entrant chooses not to compete.

Platform presentations are 10 minutes in length, with 5 minutes allowed for questions/discussion. The order of presentations will be randomly selected, although some scheduling allowances may be made for supervisors who are off-site. Posters should be in position well before the Viewing Session begins.

Three Adjudicators participate in the judging of the presentations; two are local Professional Staff, and one is the Visiting Guest Speaker. At the end of the day, the Adjudicators meet and choose the Award Recipients (Award details are given below). In general, presentations are judged based on their content, originality, relevance, science and methodology. Presentation style, background knowledge, and ability to respond to questions are also taken into account.
An Awards Banquet is traditionally held on the Friday evening of Research Day. Attendees enjoy a Banquet meal, followed by a presentation from a Guest Speaker, (usually a non-medical topic!). The evening concludes with the Awards Ceremony.

Research Day Awards

First Prize: Basic Science Category
(Anna Kossakowska Award) ($500.00): This Award is given to the most Outstanding Basic Sciences presentation. The Award is named in memory of Dr. Anna Kossakowska, a dedicated Anatomical Pathologist and Basic Science Researcher from the Department of Pathology (1984-2003). Dr. Kossakowska was a cornerstone of the Autopsy and Lymphoma services at the Foothills Medical Centre for many years, and published widely in the field of Hematopathology and Molecular Pathology.

First Prize:
Clinical Science Category ($500.00): This Award is given to the most Outstanding Clinical Sciences presentation.

Honorable Mention
(One each in the Basic and Clinical Sciences Categories)($250.00): This Award is given to the second most highly ranked presentation, in both the Basic Sciences and Clinical Sciences categories.

Best Poster Award
(Any category)($250.00): If two or more poster presentations are entered, an Award for the Best Poster will be given. The Poster Author must be present at the Poster Session, and available to answer questions in order to be considered for this Award.

Paul Kneafsey Memorial Fund and Lecture
Dr. Paul Kneafsey represented a central figure in the Department of Pathology at the University of Calgary. He served as an Anatomical Pathologist from 1989 until his untimely death in 2001.
Dr. Kneafsey was a role model in all realms of physician competency. He was extremely active in the management of Residency training, and served as Program Director from 1990 to 1999. He was a dedicated mentor to residents, and, in 2006, received posthumously the Mentor of the Year Award from the Royal College of Physicians and Surgeons of Canada. He was a committed and accomplished teacher, and won the “Teacher of the Year” Title on numerous occasions. For many of the years that he served in this department, he essentially ran the Friday morning Surgical Pathology Rounds. He also established the tradition in our department of providing and reviewing sets of unknown slides for the PGY-5 residents, to help them prepare for the Royal College Fellowship Examination. These rounds continue today, and are affectionately known to the Senior Residents as “PK Rounds”. He attended a variety of medical rounds on a regular basis, and always managed to convey his opinion along with a healthy sense of humor, which inevitably contributed to a lively discussion.

Following his death, the friends and family of Paul Kneafsey established an Endowment Fund in his name, which was meant to provide for the expenses of the Annual Research Day. The Department of Pathology and Laboratory Medicine gratefully acknowledges the generous support of Dr. Michele O'Sullivan, whose contributions have enabled the Paul Kneafsey Memorial Fund to be a self sustaining endowment, memorializing the professional record of her brother and our colleague.

Contributions to this worthy cause continue to be collected every year.
Each year, a distinguished speaker is invited to deliver the Paul Kneafsey Memorial Lecture, which is given at the Thursday afternoon CME Rounds, prior to Resident Research Day. The visiting speaker also contributes to other educational rounds for the Department, and acts as the Primary Adjudicator for the Research Day Competition.

Other Awards

At the Research Day Awards Banquet, our Department also takes the opportunity to present a number of other important Awards. These include the following:

- ✓ Outstanding Achievement in Teaching by a Resident ($500.00)

Nominees for the most Outstanding Resident Teacher are put forward by the Residency Training Committee. Ballots are then circulated to all Staff Pathologists and Residents, who vote on the Winner.

- ✓ Kristy Ells Memorial Award:

This award is given to the Resident with the most dedication in Autopsy. Kristy Ells was a morgue technologist who dedicated herself to her work in the morgue. She exemplified what being an autopsy morgue technician was.

- ✓ (Staff) Teacher of the Year:

This highly competitive and prestigious award is given annually to the staff pathologist voted to be the top Teacher of the Year by the resident's group. The winner's name is engraved on a plaque.

- ✓ Resident Appreciation Award (Outstanding Support Staff)($250.00):

This Award is presented by the Residents to the Support Staff voted to have contributed the most to residency education and general well-being in the previous year.

Note: A list of past winners in all of the above categories is available as a separate document to anyone interested.

RESIDENCY TRAINING IN NEUROPATHOLOGY

COMPLETE EDUCATIONAL PROGRAM

SCHEDULED ACADEMIC SESSIONS

PGY 1 & 2

These are compulsory for all PGY 1 & 2 neuropathology residents.

Compulsory attendance at the following Anatomic Pathology Academic Sessions is expected of all PGY 1&2 Neuropathology residents.

TUESDAY

ACSP Teleconferences

THURSDAY

CME Rounds	FMC, PLC, ACH, RGH, SHC (telehealth)	1600 – 1730 weekly

FRIDAYS PGY1 – PGY2 (Academic half-day weekly)

Academic half day is scheduled at Rockyview General Hospital on a bi-monthly basis. Didactic topics are on a 2 year cycle.

CONFERENCE	PLACE	TIME	FREQ.
Surgical Pathology Rounds	McCaig Tower, 7580	0800-0900	weekly
Didactic Session	McCaig Tower, 7580	0900-1100	weekly
Autopsy Rounds	FMC Morgue Teaching Suite	1100-1200	weekly

Anatomic Pathology Didactic Curriculum

Basic Pathology (up to 14 hours)
1) Inflammation
2) Genetic disorders
3) Immunity
4) Neoplasia I: cell cycle, tumor suppressors, and proto-oncogenes
5) Neoplasia II: invasion, metastasis, angiogenesis, and paraneoplastic syndromes
6) Infectious diseases
7) Environmental pathology

Bone and Joint Pathology (8 hours)
1) Non-neoplastic bone pathology (arthritis, osteonecrosis, fracture, metabolic diseases, osteomyelitis)
2) Bone tumors I: osseous and cartilaginous tumors
3) Bone tumors II: fibrous, giant cell, ES

Breast Pathology (6 hours)
1) Proliferative breast disease/DCIS
2) Lobular neoplasia
3) Invasive carcinoma and phyllodes tumor
4) Prognostic and predictive factors

CanMEDs Roles (4 hours)
1) Bioethics
2) Professionalism
3) Communication and negotiations
4) Leader Role

Cardiovascular Pathology (6 hours)
1) Ischemic heart disease and the cardiomyopathies
2) Cardiac neoplasia, pericardial disease, and valvular heart disease
3) Vasculitides
4) Congenital heart disease (pediatrics)
5) ASCVD and hypertensive CVD
6) Pericarditis, myocarditis, and the role of the cardiac biopsy

Cytopathology (24 hours)
1) QA in Cytopathology
2) Non-neoplastic respiratory cytology
3) ASCUS
4) Normal gyne cytology
5) Benign cellular changes (Gyne)
6) Salivary gland cytology
7) AGUS and glandular lesions of the cervix
8) Lymph node
9) Fluids: pleural/pericardial/peritoneal
10) Brain and spinal cord
11) Breast cytology
12) Retroperitoneum and soft tissue cytology
13) Neoplastic respiratory cytology
14) Urinary cytology
15) Ampullary/hepatobiliary cytology
16) Thyroid cytology
17) FNA technique/Intra-operative assessment
18) Thymus and mediastinum
19) Administrative issues

Cytogenetics (2 hours)

Dermatopathology (12 hours)
1) Approach to Dermatopathology

2) Pigmented lesions; benign
3) Malignant melanoma
4) Tumors of cutaneous appendages
5) Tumors of the epidermis, cysts and neuroendocrine carcinoma
6) Selected cutaneous mesenchymal neoplasms
7) Lichenoid reaction pattern
8) Vesiculobullous reaction pattern
9) The vasculopathic reaction pattern and panniculitis
10) Selected entities of psoriaform, spongiotic, and granulomatous dermatitis
11) Selected cutaneous infections and infestations
12) Cutaneous infiltrates

Endocrine pathology (7 hours)
1) Neuroendocrine system and paragangliomas
2) Thyroid gland
3) Parathyroid gland
4) Adrenal gland and endocrine pancreas

Forensic pathology (7 hours)
1) Introduction
2) Blunt force injury
3) Sharp force injury
4) Pediatric forensics (SIDS, child abuse, etc)
5) Environmental and asphyxial death
6) Gunshot wounds
7) Alcohol/drug abuse/toxicology

Gastrointestinal pathology (10 hours)
1) Esophagus
2) Stomach
3) Neoplastic intestine
4) Non-neoplastic intestine
5) Appendix and anus
6) Liver and biliary system (including pediatrics)

Genitourinary pathology (20 hours)
1) Prostate, kidney, bladder and testes

Gynecologic Pathology (20 hours)
1) Vagina and cervix: Intraepithelial neoplasia
2) Vagina and cervix: Malignant tumors
3) Vulva, vagina, cervix: Benign lesions
4) Vulva: Intraepithelial neoplasia and malignant tumors
5) Endometrium: Hyperplasia and carcinoma
6) Uterus: Benign and malignant mesenchymal tumors
7) Ovary: Tumor classification and common epithelial tumors
8) Ovary: Borderline and atypical proliferating tumors
9) Ovary: Sex cord/stromal, germ cell, and mesenchymal tumors
10) Fallopian Tube: Benign conditions and malignant tumors
11) Gestational trophoblastic disease
12) Female Peritoneum: Benign and malignant lesions

Head and neck pathology (10 hours)
1) Ear, nose, and throat
2) Oral and odontogenic pathology
3) Salivary gland

Hematolymphoid Pathology (12 hours)
1) Development of B/T lymphocytes/Histology of lymph node and BM
2) Overview of non-lymphoid hematopoietic disorders
3) Hodgkin lymphoma
4) WHO Classification of Lymphoma/Fluid hematopathology
5) Mature small B-cell NHL
6) Mature aggressive B-cell NHL
7) T/NK Cell neoplasms
8) Ancillary tests and Flow Cytometry

HIV Pathology

Mediastinum (1 hour)
1) Thymus

Molecular Pathology (1 hour)
1) Apoptosis

Neuropathology (13 hours)
1) Neuroanatomy for pathologists
2) Strokes and organization of necrosis
3) Trauma
4) Vascular disorders
5) Brain tumors: Adult
6) Brain tumors: Pediatric and young adult
7) Nerve and muscle pathology
8) Developmental lesions, malformations, fetal lesions, epilepsy
9) Genetic and inherited disease
10) Inflammation
11) Nervous system infectious disease
12) Neurodegenerative diseases

Pediatric Pathology (6 hours)
1) Placental pathology
2) Fetal autopsy
3) IUGR
4) Chromosomal anomalies
5) Congenital anomalies (heart, renal, etc)
6) Kidney tumors
7) Liver disorders
8) Metabolic disorders (Autopsy)
9) GI disorders
10) Small round blue cell tumors
11) Skeletal dysplasias

12) Early pregnancy loss

Pulmonary Pathology (10 hours)
1) Pulmonary vascular disease and infections
2) COPD
3) Interstitial lung disease and lung biopsy
4) Lung neoplasia
5) Pleural pathology

Renal Pathology (6 hours)
1) Medical renal pathology I
2) Medical renal pathology II

Soft Tissue Pathology (6 hours)
1) General approach to soft tissue tumors
2) Spindle cell tumors
3) Pleomorphic tumors
4) Small round blue cell tumors
5) Soft tissue slide session

Miscellaneous
1) Ocular pathology
2) Pathology imaging
3) Autopsy consent

Non compulsory rounds
Medical Grand Rounds -weekly
Surgery-pathology Rounds - weekly
Other specialty rounds (pulmonary, ICU, etc.) - monthly
Dermatopathology review of difficult cases - weekly
Special interest group rounds - monthly
Renal biopsy rounds – bi-weekly
Journal clubs – 3-4 times a year
Gyne/oncology rounds - weekly
Breast oncology rounds - weekly
Lymphoma rounds - weekly
Brain cut workshop – weekly
Clinical Neuropathology Conference – bi-weekly

RESIDENCY TRAINING IN NEUROPATHOLOGY

PGY 3, 4 & 5

Academic Half Day Structure:

Thursday Afternoons weekly

- 2 hours – Guided topic focused teaching with Pathologist
  - 1hr – Didactic Teaching (various formats)
    - PowerPoint
    - Glass slides & gross images
    - Virtual Pathology
    - Quizzes (projection/microscopy)
  - 1hr – Guided Other
    - Resident presentation
    - Journal Clubs
    - Unknown slides/ gross photography
- 2 hours – Academic Unstructured (resident chosen)
  - Choice of:
    - AP Halfday Friday AM (Friday Mornings weekly - relevant topics – PLP's, non-medical expert roles & other)
    - Clinical Neuroscience Grand Rounds (Case Presentations Fridays 8-9 am)
    - Neurology Halfday (Thursday Afternoons - relevant topics)

NEUROPATHOLOGY DIDACTIC PROGRAM– TWO YEAR CYCLE TOPICS LIST (PGY 3-5)

Anatomy

1. Basic Anatomy - Vascular anatomy: Arterial territories (spinal cord, brainstem, cerebellum, basal ganglia, thalamus, cortex); Venous drainage
2. Basic Anatomy - Coverings of the nervous system: scalp, skull, dural components, leptomeninges, pia mater; basis of blood brain barrier; spine anatomy (including osseous, neural and vascular components)
3. Basic Anatomy - Spinal Cord: levels; dorsal root ganglia; dorsal root entry zone; white matter columns; origin of ascending sensory tracts; lower motor neurons; autonomic nervous system components
4. Basic Anatomy - Brainstem; medulla, pons, midbrain; cranial nerve structure and nuclear components; ascending white matter tracts; autonomic centers; diffusely projecting nuclei
5. Basic Anatomy - Cerebellum: cerebral peduncles and connections with brainstem; structure and layers of cortex; cerebellar nuclei; cerebellar circuitry
6. Basic Anatomy - Basal ganglia: caudate, putamen, globus pallidus, subthalamic nucleus; simple and complex wiring diagrams and connections
7. Basic Anatomy - Thalamus: somatosensory, visual, auditory, motor (cerebellar and basal ganglia), limbic association; reticular nucleus; intralaminar nuclei; basic connections
8. Basic Anatomy - Diffuse systems: acetylcholine, epinephrine, norepinephrine, dopamine, serotonin, histamine; nuclei and projections; basic functions
9. Basic Anatomy - Hypothalamus and autonomic nervous system: major functional divisions of hypothalamus; major anatomic divisions of hypothalamus; ascending autonomic sensory information; descending autonomic control signals
10. Basic Anatomy - Allocortex: entorhinal cortex, amygdala, hippocampus; gross and histological features; basic connections
11. Basic Anatomy - Neocortex: orbitofrontal, prefrontal, motor, and premotor, somatosensory, posterior association areas, auditory, temporal association areas, occipital, insula; architectonics; major corticocortical connections; major intracortical connections

Histology

12. Neurohistology - Routine Stains & Immunoperoxidase; method of contrast enhancement; mechanisms of major stains; key immunoperoxidase stains in neuropathology
13. Neurohistology - Electron microscopy: basic principles; method of contrast enhancement; muscle and nerve EM; brain EM
14. Basic Histology And Cellular Function - Neurons & Synapse: neuron doctrine; concept of labeled line; synaptic transmission and cellular potentials
15. Basic Histology And Cellular Function - Myelin & Axonal Transmission: structure of myelin (physical, protein composition; lipid composition); axonal physiology
16. Basic Histology And Cellular Function - Muscle and Nerve: histology and ultrastructure of muscle and nerve; basic reactions to injury in muscle and nerve; Wallerian degeneration; denervation changes; type 2 myofiber atrophy
17. CSF Cytology - Smears

Reactions to Injury

18. Reactions - Basic: Inflammation, microglia, mineralization; edema mechanisms; herniation patterns
19. Reactions - Organization and timing of necrosis; patterns of necrosis
20. Reactions - Neurons: neuron death sequence; nuclear and cytoplasmic inclusions; axonal degeneration and central chromatolysis
21. Reactions - Glia: astrocytosis; oligodendrocyte death; demyelination; ependymal reactions

Ischemia & Infarction

22. Thromboembolic Disease: atherosclerosis; vascular anatomy: patterns of infarction; named clinical syndromes
23. Small Vessel Disease: lacunar infarcts, microangiopathy, leukoaraiosis
24. Hypoxic-ischemic Encephalopathy; borderzone infarction; sensitive neurons (hippocampus regions, Purkinje neurons, substantia nigra, etc); hypoglycaemia; venous thrombosis

Vascular Diseases

25. Vascular diseases - vasculitis; amyloid angiopathies
26. Vascular diseases - Malformations; aneurysms; arteriovenous malformations; venous angioma; cavernous angioma; telangiectasia; fibromuscular dysplasia
27. Hemorrhages: catastrophic intracerebral hemorrhages

Development

28. Development - Mechanisms: Spemann-Mangold organizer; neural induction; polarity and neuraxis; pattern formation; midbrain-hindbrain organizer; segmentation of hindbrain; axon outgrowth and guidance
29. Development - Neuroembryology: Carnegie stages 1-23; implantation; gastrulation; neurulation; folding; spinal cord; Meninges, Choroid Plexus, Vascular Supply, Fibre Tracts
30. Development - Cerebellum & posterior fossa
31. Development - Thalamus, subthalamus, and hypothalamus
32. Development - Telencephalon and cortex

Malformations

33. Malformations - Neural Tube Closure Defects; anencephaly spectrum; Chiari malformations; cysts and lipomas
34. Malformations - Encephaloclastic Lesions: basket brain; effect of brain age on pathological manifestations
35. Malformations - Telencephalon: holoprosencephaly spectrum; double cortex; laminar band heterotopia; polymicrogyria; pachygyria; hemimegalencephaly; cortical dysplasia and other epilepsy neuropathology
36. Malformations - Cerebellum and Brainstem: pontocerebellar hypoplasia; Joubert syndrome; Dandy-Walker malformation

Fetal and Perinatal Pathology - Acquired

37. Germinal matrix hemorrhages, periventricular leukomalacia
38. Pontosubicular necrosis, telencephalic gliosis, status marmoratus, ulegyria
39. Mental Retardation and Cerebral palsy
40. Perinatal infections

Infectious Diseases

41. Infectious Diseases - Bacteria
42. Infectious Diseases - Fungi and yeast
43. Infectious Diseases - Protozoa and metazoa
44. Infectious Diseases – Viral, acute and chronic

Inflammatory Diseases

45. Basic Immunology
46. Inflammatory Diseases - White Matter: inflammatory diseases of myelin - Multiple sclerosis, acute disseminated encephalomyelitis, acute hemorrhagic leukoencephalopathy; CIDP
47. Inflammatory Diseases - Gray Matter: paraneoplastic encephalitis, sarcoidosis, Rasmussen's encephalitis
48. Langerhans Cell Histiocytosis And Other Histiocytic Lesions

Toxic and Exogenous Injuries; Deficiencies

49. Toxins - Ethanol, carbon monoxide, glue, cocaine, glue, etc; Ionizing radiation, chemotherapy effects
50. Endogenous Metabolic Derangements (Hepatic Encephalopathy Spectrum, Myelinolysis); vitamin deficiencies; Wernicke-Korsakoff syndrome; subacute combined degeneration

Genetic & Inherited Diseases

51. Inherited Diseases - Chromosomal Abnormalities: trisomy 13, trisomy 18, trisomy 21; select chromosome deletion syndromes (William's syndrome, Miller-Dieker syndrome)
52. Inherited Diseases - Gray Matter: classification of storage diseases; neuronal ceroid lipofuscinosis; spinal muscular atrophy, Kennedy's disease
53. Inherited Diseases - White Matter: leukodystrophies
54. Mitochondrial Diseases

Muscle Diseases

55. Myopathies - Inflammatory
56. Myopathies - Congenital muscular dystrophies
57. Myopathies - Limb girdle dystrophies; Duchenne & Becker muscular dystrophies
58. Myopathies - Congenital myopathies
59. Myopathies - Myofibrillary myopathies
60. Myopathies - "Triple repeat" myopathies (e.g. Myotonic dystrophies), Emery-Dreifuss MD
61. Myopathies - Metabolic and toxic, including mitochondrial myopathies

Nerve Diseases

62. Neuropathies – Axonal neuropathies; inherited axonal diseases
63. Neuropathies - Demyelination; inherited diseases of myelin sheath

Neoplasms

64. Neoplasms - Diffuse gliomas (astrocytomas and glioblastoma; oligodendrogliomas); molecular biology of diffuse gliomas; molecular differences from diffuse pediatric gliomas
65. Neoplasms - Ependymal tumours
66. Neoplasms - Choroid plexus tumours

67. Neoplasms - Low-grade gliomas (pilocytic astrocytoma, pleomorphic xanthoastrocytoma, angiocentric glioma)
68. Neoplasms - Neural tumours (ganglioglioma, rosette-forming glioneuronal tumour, etc)
69. Neoplasms - Primitive tumours (medulloblastoma, ATRT, ETANTR, pineal tumours)
70. Neoplasms - Meningioma and other meningeal tumours
71. Neoplasms - Miscellaneous tumours (hemangioblastoma, notochord, sella tumours); metastatic tumours and workup for mets
72. Neoplasms - Hematologic malignancies
73. Neoplasms - Peripheral nerve tumours
74. Neoplasms - Pituitary tumours; germ cell tumours
75. Genetic Diseases - Phakomatoses: neurofibromatosis types I and II; tuberous sclerosis complex
76. Molecular biology - Techniques (FISH, PCR, sequencing, rearrangements, Nanostring, Affemetrix, other platforms)

Neurodegenerative Diseases

77. Alzheimer's disease: neuroanatomy; histopathological features; staging; pathogenic hypotheses
78. Lewy body disease: Parkinson's disease, cortical Lewy body disease; distribution of Lewy bodies; Other synucleinopathies: multisystem atrophy
79. Frontotemporal Dementias: TDP43; tauopathies; others
80. Tauopathies: progressive supranuclear palsy, corticobasal degeneration; deposition of tau in other diseases
81. Motor Neuron Diseases: ALS and ALS variants
82. Creutzfeldt-Jacob and other prion diseases
83. Nucleic Acid Repeat Diseases: Huntington's disease (type 1 & 2); Friedreich's ataxia; Fragile X ataxia; spinocerebellar atrophies
84. Neuropathology of psychiatric disorders: schizophrenia, depression, autism-spectrum disorder

Traumatic Injuries and Forensic Neuropathology

85. Traumatic Brain Injury - adult blunt head trauma; pediatric brain trauma
86. Traumatic Brain Injury - missile injuries
87. Spine and Spinal Cord Trauma

Ophthalmic Pathology - Elective

Ophthalmic pathology - non-neoplastic
Ophthalmic pathology - neoplastic

REGULAR MEETINGS

NEUROPATHOLOGY TEACHING FOR NEUROLOGY RESIDENTS – These are held on the first Tuesday of every month alongside the Adult Neurology Half Days – they start at 1:30pm and are assigned to the Neuropathologist who volunteered to teach for this day. They are normally held in the 7580 McCaig Conference Room, or if there is an interesting brain cut case – the Morgue Teaching Suite.

CLINICAL NEUROSCIENCE ROUNDS https://www.ucalgary.ca/dcns/rounds
At 8am Friday Weekly clinical cases are presented. If approached with regards to presentation of pathology in a case the neuropathology resident involved is expected to present pathological findings.

NEUROPATHOLOGY GROUP MEETINGS
Scheduled bi-monthly from 9-10 am on a Wednesday.
Discussion of Neuropathology laboratory processes procedures and pitfalls.

NEUROPATHOLOGY RESIDENCY PROGRAM COMMITTEE MEETINGS
As outlined in the section of the manual above

RESIDENCY TRAINING IN NEUROPATHOLOGY

Mandatory & Suggested Rounds

MONDAY

09:00 – 10:00 NEUROPATHOLOGY QA Conference
(Weekly –Monday – Multiheaded Microscope Room, MT 7578)
Attended by neuropathology faculty, neuropathology and rotating clinical neuroscience residents and interested anatomical pathology residents. This is a type 1 self accredited learning activity

TUESDAY

08:00 – 1200h NEUROPATHOLOGY ACADEMIC DIDACTIC SESSIONS/ACADEMIC HALF-DAY
Held in McCaig Conference Room 7580.
Unknown Slide Sessions – Dr. Robert Hammond
Gross Photo Review - monthly

13:00 – 16:00 NEUROPATHOLOGY WORKSHOP
(Weekly – Morgue Teaching Suite, FMC)
Attended by neuropathology, clinical neurosciences and anatomical pathology residents; supervised by staff neuropathologist. Neuropathology and clinical neurosciences residents responsible for gross examination, blocking, description and preliminary neuropathology report on all primary neurology/neurosurgiccal cases.

16:00 – 17:00 ACH ONCOLOGY ROUNDS

WEDNESDAY

07:30 – 08:30 NEUROMUSCULAR BIOPSY REVIEW ROUNDS
(First Wednesday, Monthly, TBCC cc121)
Attended by clinical neuromuscular and neuropathology faculty. September - June

15:00 – 16:00 NEURO-ONCOLOGY ROUNDS
(Weekly – TBCC Board Room)
Attended by neuro-oncologists, neurosurgeons, neuropathologists, radiation oncologists, psychologists, residents (neuropathology, neurosurgery, oncology), nurses, and radiation technologists.

THURSDAY

09:00 – 11:30 PEDIATRIC NEUROPATHOLOGY WORKSHOP
(Weekly, ACH Autopsy suite)
Attended by neuropathology, rotating clinical neuroscience, anatomic pathology residents, anatomic pathologists, and supervising neuropathologist.

16:00 – 17:30 PAEDIATRIC NEURO-ONCOLOGY TUMOUR BOARD
Held on the second and fourth Tuesday of the month at ACH, Oncology, Conference Room 2.

FRIDAY

08:00 – 09:00 CLINICAL NEUROSCIENCE GRAND ROUNDS
FMC Coombs Lecture Theatre

***PGY 3-5 Neuropathology Residents are expected to attend the above sessions.**

Other Organized Scholarly Activities:

MONDAY

08:00-09:00 DEVELOPMENTAL NEUROSCIENCES GRAND ROUNDS
Weekly – ACH Amphitheatre 4th Floor

WEDNESDAY

16:30-17:30 PET Imaging/DEMENTIA Rounds
(Bi-weekly)

THURSDAY

08:00 – 09:00 EPILEPSY CONFERENCE
(Monthly -)
Occasional attendance when pathology is presented

08:30 – 10:30 DEPARTMENT OF MEDICINE GRAND ROUNDS
(Weekly – Coomb's Lecture Theatre - FMC)

FRIDAY

12:00 – 13:00 DEMENTIA ACADEMIC ROUNDS

12:30 – 13:30 HOTCHKISS BRAIN INSTITUTE SEMINAR SERIES
(Weekly, HSC, Room G601)
Attended by clinical and neuropathology faculty and PGY4 and 5 neuropathology residents

NOTES:
During the PGY2 year, neuropathology trainees will attend all anatomical pathology scheduled teaching activities including ASCP teleconferences and actively participate in presentations of that program.
By completion of the PGY5 year, the trainee must have audited relevant sections of the didactic program - i.e. laboratory safety, staining technology principles, immunohistochemistry, biostatistics, biomedical ethics, laboratory management, cytogenetics. It is expected that a PGY4 or PGY5 resident would take advantage of the research laboratory activities.

Arrangements for Residents to Attend Academic Sessions

Most mandatory teaching sessions in the Department of Pathology (Neuropathology) are held between the hours of 0800h - 1700h to ensure attendance by most residents and so as not to interfere with clinical activities.

Residents auditing specifically identified courses such as graduate courses are excused from routine duties at the discretion of the Program Director or assistant Program Director.

In the Department of Pathology, (Neuropathology) Thursday afternoon (partial) and Friday morning (partial) have been designated as an academic half-day equivalent and most mandatory sessions are held then.
Neuropathology residents are also free to attend appropriate sessions in the Clinical Neuroscience (Neurology) academic program.

Special Courses

PGME Workshops and Events
http://cumming.ucalgary.ca/pgme/workshopsevents

POLICIES AND PROCEDURES

Requests for Time off – Sick/Vacation/Conference and Leave of Absence

SCOPE: All residents enrolled in the Neuropathology Residency Training Program, University of Calgary.

PURPOSE: For the fair and equitable distribution of resident call and service work requirements within the section of Neuropathology for the academic year.

REQUIREMENTS:

- All requests for time off must be submitted no less than 6 weeks prior to the block in which the leave occurs.
- All requests shall be submitted on the specified form entitled "*NP Resident Leave Form v.2014.pdf*"

PROCEDURE:

1. The resident will fill out the specified form with all pertinent details including name of preceptor and rotation in which the leave occurs and submit the form to the Program Administrator via email: kristy.campbell@albertaprecisionlabs.ca

2. The Program Administrator will forward the request to the appropriate preceptor for approval.

3. Once approved by the preceptor of the rotation, the Chief Resident signs (AP Chief Resident for PGY2 requests; NP Chief for all other requests) and then the form is approved by the Program Director.

4. The information is entered into One45.

5. The signed copy is scanned to the network and saved with the following naming convention: LastName_FirstName Year month dates.pdf (eg. Hamilton_Leslie 2012 June 1-5.pdf)

6. A final electronic copy is provided via email to the resident for their files.

ADDITIONAL INFORMATION:

Leaves of Absence

1. For all Leave Of Absence requests (longer than 2 days) a separate PGME form must also be filled in, which requires the Program Directors signature, will be forwarded to PGME and the AHS Medical Education Office specifying reason (maternity/parental, compassionate, sick or educational etc.), type (paid or unpaid) and length (including calendar dates) of the leave.

2. In contrast to vacation time, a leave of absence (LOA) can be granted at any time, at the discretion of the program director. A leave of absence is granted for emergency situations. The preceptor and chief resident should be notified after approval is obtained. Residents are not required to divulge details regarding emergency situations to anyone other than the program director.

3. In the situation where the resident is faced with a dire emergency requiring a leave of absence (serious illness, death of a loved one, for example) the chief resident will assist the affected resident in contacting appropriate staff in the department and in assuring coverage of call.

4. Even in the case of a leave of absence, the resident should make a valid attempt to provide coverage for the service they are assigned to. Staff, however, MUST be aware that due to the small numbers of residents on each rotation, the likelihood of having coverage in the face of a leave of absence is very small.

5. For extended leaves of absence due to illness, a physician's note should be presented upon return of the resident. If there is an extended leave of absence > 3 blocks in length for any reason (excluding maternity leave), it is the resident's responsibility to inform the Program Administrator, and to have the appropriate forms completed well ahead of the cut-off date. Failure to do so may result in delays in Employment Insurance payments being issued (i.e. the resident will not get paid).

6. Winter Break (Block 7)

   Subject to patient care requirements as determined by the Program Director in consultation with AHS, Resident Physicians will receive six (6) consecutive days off duty with pay between December 20 and January 5 in lieu of Christmas Day, Boxing Day, and New Year's Day. This provision takes advantage of the seasonal slowdown in health services to afford Resident Physicians with an extended period of rest away from their regular duties.

   There will be no additional time off in lieu for Resident Physicians who work between December 20 and January 5 provided they have received their six (6) consecutive days off as per Article 21.03(a).

   The parties recognize that this provision represents a special situation and that standard, shift-based and on-call duty hours (Article 23) are to be maintained prior to and after the six (6) day block. Duty schedules may be amended to meet the terms of this provision and meet patient care service requirements.
   Where possible, Resident Physicians shall not be scheduled for on-call service the day preceding the six (6) consecutive days off.
   Time off in excess of six (6) consecutive days may be granted at the discretion of the Program Director.

VACATIONS

1. The training program conforms to the vacation policy as set out by PARA.

2. In general, no more than two weeks (5 working days) of vacation may be taken during any one rotation. If the rotation/block is only four weeks in length, taking more than the specified length of vacation will result in the rotation as being marked "incomplete" . Even in longer rotations this rule should be applied.

3. Apart from emergency situations, no vacation/leave shall be granted for PGY1 and PGY2 residents during the first week (Orientation Week) of July. In fact, any vacation/leave for PGY1 and 2 residents during Block 1 is strongly discouraged, as training sessions are very tightly scheduled at this time, and make-up sessions for individuals cannot be accommodated.

4. Vacation requests are also strongly discouraged (and may be denied) during the mandatory 4 week Anatomy Block for PGY1 residents, as preceptors and supplies are specifically reserved for the residents at this time, and cannot be re-scheduled.

5. In addition, vacation requests are likely to be denied for Resident Research Day and/or the Resident Retreat. These special events are organized well ahead of time to address specific components of the Residency Training Programs, and therefore should be taken seriously.

6. Whenever possible residents must submit requests 6 weeks in advance of the time requested. Under extenuating circumstances, the program might consider a request outside of this rule judged on a case-by-case basis. The request would be made to the preceptor and the program director. If the request is for vacation time/educational leave, the resident would be expected to arrange coverage for his or her service commitments. The resident MUST find coverage for call if they have been scheduled to be on call during requested time off.

Conference/Educational Leave

1. Residents will be allowed up to one week (i.e. 5 working days) of conference/educational leave per academic year (July 1st – June 30th). Any additional time taken will be considered vacation time. Requests for exceptions to this rule can be made to the RTC.
2. In addition to the above, residents are excused from service duties to attend the Banff Conference, if they so desire. If a resident chooses not to attend the Banff Conference, however, he/she is expected to remain on service.
3. This definition also excludes preparation and travel time required to write licensing exams (Royal College Exams, American Board Exams, etc.); PARA provides 5 days "leave" per exam (see: www.para-ab.ca).
4. Resident Ski Day, Resident Retreat, and Research Day are also excluded from the above definition. Again, if a resident chooses not to participate in these activities, he/she is expected to remain on service.

CME Funding

1. $2,500 per resident per PGY year which can include the following allowable expenses:
   i) Course or Conference Travel $2,000 maximum per instance
   ii) ii)USMLE Examination Travel $1,000 maximum per instance
   iii) iii)Electronic Learning Subscription/Software (e.g. UpToDate)
   iv) iv)Textbooks
   v) v)Examination Fees

2. Residents can make claims to their CME account during each of their 5 Post Graduate years. All PGY levels can start to claim their CME after July 1 and all claims for this year must be submitted no later than the end of February. One should note that a PGY 5 must claim any eligible CME expenses before the end of February without carry-over. Eligible claims submitted after that time will be deducted from the resident's following year's CME fund (with the exception of final year residents, whose funds will expire February 28th of their final year of training and if not submitted by the deadline, funds will be forfeit.)

   i) In accordance with CLS/AHS/U of C Policy, the funds will be made available during each Fiscal year (April 1st – February 28th), and will not be carried over. All expense claims for the fiscal year are therefore to be submitted to the Program Administrator for processing prior to the specified deadline. ***Note that claims older than 6 months will not be honored***.

   ii) The funds are to be used for educational expenses such as: travel and conference expenses (*see restrictions below), books and software purchases, publication costs, membership and tuition fees, personal educational equipment, etc. If in doubt as to eligibility, the expense should be pre-approved by the Program Director(s) well ahead of the planned purchase (at least 6 weeks).

   iii) Alberta Health Services (AHS) oversees the APL Budget, and has put in place certain restrictions on Travel, Hosting, and Hospitality Expenses. For comprehensive information regarding expensing guidelines, please refer to the CLS Travel, Hosting, and Hospitality Policy:

   The RTC recognizes that travel to conferences and educational events is of extreme importance to our trainees, therefore anyone who plans to travel outside of Alberta for a conference or meeting, and who requires support in addition to what can be provided by CME & PGME (see below), should bring their request forward to the RTC for discussion.

NOTE: If a resident plans to use their CME funding to travel outside of Alberta they shall be required to fill out a Pre-approval form and submit supporting documentation to the Program for approval before travel is booked. (Please see your Program Administrator for the updated form and additional information)

3. The Neuropathology Program has will also fund each resident to attend the CAP Review Course **ONCE** during residency. The expense cap for this travel will be $1,500, anything over and above this amount could be claimed through your regular CME account if you have funds available. Please advise your Program Administrator well in advance which year you may plan to attend (usually PGY5).

4. The Neuropathology Program will also fund each resident in their final year of training up to $1,000 **ONCE** to help cover the costs to Travel to Ottawa to write the Royal College Exam for our specialty.

5. Funds may also be available for travel directly from PGME. For example, a resident giving a poster or platform presentation at a North American conference may be eligible for PGME funding of $2,000.00/meeting providing the following conditions are met:

   i) The resident must be the first author (case reports are excluded).
   ii) The project/study must be original work.
   iii) The resident is responsible for first applying for PGME funding during the specified call for proposals (quarterly) in advance of the planned trip, and must have PGME approval before they travel (see: http://medicine.ucalgary.ca/postgrad for Form). If expenses are anticipated to be over and above $2,000.00, the resident may use his/her CME fund to "top up" the reimbursement. PGME will consider more than one request per year from a given resident.

   PGME also provides support for a Senior Resident (generally the Chief Resident) to attend the ICRE meeting (check PGME website for details).

6. The APL Resident's budget will cover costs related to group purchases or activities, such as the Resident Retreat, visiting speakers, Journal Club, working sessions, etc.

7. All of the above guidelines are contingent on available funds.

Post Exam Process/Procedure

SCOPE: All residents enrolled in the Neuropathology Residency Training Program, University of Calgary.

PURPOSE: To define how the post examination process will function so that expectations are clear between staff and resident trainees.

PROCEDURE:

1. Examinations will be marked within one week of administration.
2. Original exams will be scanned and kept in the permanent resident file.
3. Written parts will be returned to the resident.
4. Glass Slide and Image parts will be reviewed as **part** of a half day session or ad hoc if requested.

RESIDENCY TRAINING IN NEUROPATHOLOGY

Neuropathology Residency Program Safety Policy*UPDATED*

SCOPE: All residents enrolled in the Neuropathology Residency Training Program, University of Calgary.

PURPOSE: To ensure the residents of the Neuropathology Residency Training Program have a safe environment in which to learn and practice.

DISCUSSION: The Neuropathology Program is committed to providing a safe and equitable work/learning environment for its trainees; as such this program abides by the following policies on safety and respectful workplace.

Excellent guidance is available in the University of Calgary Manual *'Guidelines for Administrators When Acting on Concerns About Conduct'* and the recently approved Faculty of Medicine document *'Professional Standards For Faculty Members And Learners In The Faculty Of Medicine At The University Of Calgary'*. The PGME Office maintains a close relationship with Legal Services, the provincial college, the CHR medical staff office, and the AMA and facilitates assistance from these bodies when appropriate.

Trainees are made aware, both verbally and in writing, of two additional pathways to address this problem – 'PARA help line' and assistance from the Postgraduate Dean's Office of Medical Education.

The program would defer to the Division Chief or Department Chair regarding professional assistance for the faculty member.

The Office of Sexual Harassment on main campus serves the Faculty of Medicine for all types of harassment complaints. In addition, the Associate Dean for Equity and Teacher Learner Relations in the Faculty of Medicine has an office that provides mediation support as well as policy development, education, research, and oversight. All residents are made aware of these facilities at the beginning of their training.

PGME Safety Policy
http://wcm.ucalgary.ca/pgme/files/pgme/resident-safety-rev-june-4-2013.pdf

Calgary Laboratory Services Safety Manual
https://cls.labqms.com/labFrame.asp?DID=19613&FLDVr=1978

Calgary Laboratory Services Respectful Workplace Policy
https://cls.labqms.com/labFrame.asp?DID=14104&FLDVr=2030

Calgary Laboratory Services Human Rights Policy
https://cls.labqms.com/labFrame.asp?DID=14103&FLDVr=2030

Professional Standards for Faculty Members and Learners
http://wcm.ucalgary.ca/pgme/files/pgme/faculty-of-medicine-professional-standards-code-of-conduct.pdf

STAFF RESPONSIBILITIES

SCOPE: All Neuropathology Professional Staff in the Section of Neuropathology, University of Calgary & Calgary Laboratory Services.

PURPOSE: To ensure the smooth running of the current Neuropathology ROTA system.

ON-CALL DUTIES: Include handling ALL frozen sections, surgical specimens, biopsy and autopsy room neuropath cases (including donations) and covering night and weekend calls, with associated supervision of neuropath or concerned anatomic pathology resident.

The person on brain-cut will act as "back-up" (cover sickness, meetings, etc) for on-call neuropathologist. On-call neuropathologist should, where possible, notify back-up neuropathologist that assistance will be required.

If you are unable to do your designated week "on-call", please arrange for a straight shift of duty week with another neuropathologist and inform the neuropathology program administrator (Kristy – 944-4639).

SURGICAL
Material arriving and grossed on Friday will be signed-out by the neuropathologist on-call at the time micro slides are available for examination (exception: if a frozen section is done on Friday and neuropathologist wants to follow-up on the paraffin, he may follow case through - otherwise he/she does not usually see gross anyway). Peripheral nerves (5 days for full processing) and large specimens requiring prolonged fixation and technical procedures (eg lobectomy for epilepsy) will go to the neuropathologist on-call the day the case is ready for micro review.

All phone **ENQUIRIES** regarding surgical and autopsy neuropathology will be handled by the neuropathologist on-call.

All surgical/autopsy blocks/slides **CONSULTS** coming in from outside hospital will be handled by the neuropathologist on-call (or senior neuropathology resident).

All **AUTOPSY CNS MATERIAL** coming through the Department will present for the routine neuropathology workshops in order of arrival. If a neuropathologist has a known interest in a particular case (handled the surgical, investigative interest, etc) then the case should be discussed between interested neuropathologist and duty brain-cut pathologist. Protocols should be provided for all material being used for investigative purposes.

NEUROPATHOLOGY WORKSHOPS are scheduled teaching sessions. If at all possible they must proceed at the designated time on the set day. If they clash with a meeting that cannot be re-arranged then **please arrange** to do next morning at a time mutually agreeable to both the resident and the pathology assistants.

If you cannot supervise the workshop that day then **please arrange** with the person "on-call" to cover the workshop for you.

PHOTOGRAPHY The supervising neuropathologist is responsible for the quality of the gross photographs. Please give feedback to concerned resident/pathology assistant. Tom Kryton from the Virtual Microscopy Lab is available for taking gross photos of Brain Dissection.

TEACHING RESOURCES

Guidelines for Case presentations

SCOPE: Each Resident will be expected to make give case presentations at various clinical/academic rounds

CANMEDS COMPETENCIES: Professional, Medical Expert, Communicator, Health Advocate

GOAL

To provide the resident trainee with a comprehensive guide for presenting to a Professional Audience at Hospital Rounds, Departmental Meetings and Scientific Gatherings.

GUIDELINES

1. Review slides and prepared remarks with the supervising pathologist and or chief resident well in advance of the actual presentation. This aids in:
    - Anticipating questions
    - Gives feedback regarding the quality and informative value of your slides
    - Reduces intradepartmental controversy regarding the validity of your comments
    - Serves as good practice to ease anxiety and improve public performance
2. Invite collegial colleagues and interested parties. Your efforts will benefit both yourself and those who attend the presentation. In general, people do not read memos or weekly conference schedules and will not know about your case or attend the conference unless you personally communicate with them.
3. Be knowledgeable with regard to the audio and visual equipment you will use.
4. Use good clear photographs and describe what the tissue shows.
5. Be critical of redundancy. Split image photographs are extremely effective when comparing normal vs. diseased tissue or when showing magnification juxtaposition.
6. A useful rule of thumb is to take photos at one power higher than you had originally planned.
7. Face the audience. Engage each of them into the presentation by making eye contact.
8. Point with the pointer. Waving the pointer is distracting to the audience.
9. Use your upstage hand to hold the pointer (ie the one closest to the screen)
10. Do not assume your audience (if it includes clinicians) knows the pathological vernacular. In general, accurate and concise description is better than over using entrenched phraseology (elongated vs. spindle shaped)

Guidelines for Neuropathology Reports

SCOPE: All Neuropathology Residents enrolled in the Neuropathology Residency Training Program, University of Calgary & Calgary Laboratory Services.

PURPOSE: To ensure the smooth running of the current Neuropathology ROTA system.

GUIDELINES FOR NEUROPATHOLOGY REPORTS - (Emphasis on Neuropathological Autopsy Reports)

1) The Anatomic Diagnosis in your report summarizes your observations (not findings from the general autopsy or the clinical information). Where information other than your own observations is essential for understanding the anatomic diagnosis, it can be included in the anatomic diagnosis, but should be clearly distinguished from your own findings. For example by placing it in parentheses, e.g., "(History of Parkinson's disease)".

2) Throughout your report, clearly distinguish your findings from information you have from other sources.

3) The report is a legal document. Mentally put yourself in a court of law, under oath, as you write it.

4) Be sure you express yourself clearly as to what you mean.

5) In the summary, include a clear and succinct clinicopathologic interpretation for the clinicians. {Have you answered the questions they would have wanted answered?}

6) When using the original text of the anatomic (general) autopsy summary for your own summary, edit out those items irrelevant to the neuropathology report.

7) Check the draft carefully for errors that may have crept in during typing, etc. Use the spell check function on your word processor.

JOURNAL AND LITERATURE SOURCES

SCOPE: All Neuropathology Residents enrolled in the Neuropathology Residency Training Program, University of Calgary & Calgary Laboratory Services.

PURPOSE: To provide a list of sources for online Journal/Literature retrieval.

LIST OF JOURNAL AND LITERATURE WEBSITES:

Health Information Network Calgary
http://hinc.ucalgary.ca/journals

PubMed Central
http://www.ncbi.nlm.nih.gov/pubmed

University of Calgary Library
http://library.ucalgary.ca/

Academic Forensic Pathology
https://www.afpjournal.com/

AHS Knowledge Management
http://krs.libguides.com/home

NATIONAL NEUROPATHOLOGY LECTURE SERIES

http://portal.utoronto.ca

Some of the lectures are:

- Genetics of AD
- ARX in brain development
- Dystroglycan related muscular dystrophies
- A neuropathologic approach to cases of suspected child abuse
- Diagnostic approaches in CMD and LGMD
- **More lectures are being added all the time!**

Guest ID: qq116240
Password: heenoo2i

- The lecture series is listed under "Courses in which you are enrolled"
- Select the "Canadian Neuropathology Lecture Series" link and access the "Lectures" from the left hand menu. Some lectures will take time to download onto your computer (ie. Lecture 1) and can then be viewed using 'Real Player' or other free software. Other lectures (ie. Lecture 2) will open and play instantaneously.
- After viewing the lecture, please complete the quiz questions under the "Assessment tools" from the left hand menu.

OTHER RESOURCES

AIMG: http://www.aimg.ca/

Alberta Health Services: http://www.albertahealthservices.ca

Alberta Rural Physician Action Plan: http://www.rpap.ab.ca/

AMA Physician and Family Support Program: (PFSP)
Hotline: 1-877-767-4637 (toll free 24 hours/day)
http://www.albertadoctors.org/bcm/ama/ama-website.nsf/AllDoc/FB63EBAA53FB0B6987256DE3005F370B?OpenDocument

CLS: http://www.calgarylabservices.com

CLS Iweb:
http://clsiweb.calgaryhealthregion.ca/

CMPA: https://www.cmpa-acpm.ca/cmpapd04/docs/highlights-e.cfm

Occupational Health and Safety Office: http://www.calgaryhealthregion.ca/supp/ohs

PARA: http://www.para-ab.ca 403-236-4841

PARA Collective Agreement http://www.para-ab.ca/residents/collective-agreement

PGME: http://medicine/ucalgary.ca/postgrad

AHS Protection Services:
ACH 403-955-7600
FMC 403-944-1152
PLC 403-943-4502
RGH 403-943-3430

Royal College of Physicians and Surgeons of Canada http://rcpsc.medical.org/

University of Calgary

Counseling Services: http://www.ucalgary.ca/counselling/personalcounselling

Sexual Harassment Office: Shirley Voyna Wilson 403-220-4086 wsvoyna@ucalgary.ca

Faculty of Medicine Office of Equity and Teacher Learner Relations: phone: 403-210-6424
email: etlr@ucalgary.ca
website: http://medicine.ucalgary.ca/equity_teacher-learner

Access and Privacy Coordinator: http://www.ucalgary.ca/secretariat/privacy

RESIDENCY TRAINING IN NEUROPATHOLOGY

NEUROPATHOLOGY DIGITAL SLIDE COLLECTION

SCOPE: All Neuropathology Residents enrolled in the Neuropathology Residency Training Program, University of Calgary & Calgary Laboratory Services.

PURPOSE: To provide a comprehensive set of neuropathology microscope images.

LIST OF DIGITAL SLIDE COLLECTIONS:

Aperio Neuroanatomy Collection

URL: http://digitalmicroscopy.ucalgary.ca/
Click on "Guest Login"
Click on "Advanced Search" at top
Click on the "+" sign next to the "Digital Slide Fields"

- under the "Modify Search Criteria" set;
- choose "Keywords" from the pop-up menu
  Select "contains" from the pop-up menu and type "Neuroanatomy" in the text box
  Click the "Search" button beneath
- Click on a specific section (scroll down the window or go to the next window by clicking "Next" in the upper right hand corner of the list

RESIDENCY TRAINING IN NEUROPATHOLOGY

NEUROPATHOLOGY RESIDENT LIBRARY *updated*

AUTHOR	TITLE	EDITION	YEAR
NEUROANATOMY			
Fix	Atlas of the Human Brain and Spinal Cord	1st ed	2008
Mai, Paxinos, Voss	Atlas of the Human Brain	3rd ed	2008
Mai, Paxinos	Atlas of the Human Brain	4th ed	2016
England, Wakely	Color Atlas of the Brain and Spinal Cord	2nd ed	2006
Netter	CIBA Collection: Volume I Nervous System	1st ed	1967
Gertz	Liebman's Neuroanatomy made Easy and Understandable	6th ed	1999
Martin	Neuroanatomy Text and Atlas	2nd ed	1996
Sidman & Sidman	Neuroanatomy	1st ed	1965
	Neuroanatomy through __--Cases	2nd Ed	
Osborn, Hedlund, Salzman	Osborn's Brain	2nd Ed	2018
	The Human Brain		
	The Human Central Nervous System		2008
Paxinos, Furlong, Watson	Human Brainstem – 3 copiess	Revised Ed	2020
DeArmond, Fusco, Dewey	Structure of the Human Brain a Photographic Atlas	3rd Ed	1989
DEVELOPMENTAL NEUROPATHOLOGY			
Squier	Acquired Damage to the Developing Brain	1st ed	2002
Adesina, Tihan, Fuller, Poussaint	Atlas of Pediatric Brain Tumors	2nd ed	2016
Bayer, Altman	Atlas of Human Central nervous System Development vol1	1st ed	2002
Bayer, Altman	Atlas of Human Central nervous System Development vol2	1st ed	2004
Bayer, Altman	Atlas of Human Central nervous System Development vol3	1st ed	2005
Golden, Harding	ISN series: Developmental Neuropathology	1st ed	2004
Moore, Persaud	The Developing Human: Clinically Oriented Embryology	9th ed	2013
Gilles & Nelson	The Developing Human Brain: Growth and Adversities	1st ed	2012
Ernst, Ruchelli, Huff	Color Atlas of Fetal and Neonatal Histology	1st ed	2011a
Gray, Keohane	Developmental Neuropathology – two books	2nd Ed	2018
GENERAL NEUROPATHOLOGY			
Treip	A Colour atlas of Neuropathology	1st ed	1978
Adams, Graham	An Introduction to Neuropathology	2nd ed	1994
Blackwood et al	Atlas of Neuropathology	2nd ed	1964
Girolami			
Prayson	Brain Tumors	1st ed	2010
WHO Blue Book	Classification of Tumors of the Central Nervous System – 2 copies	4th ed	2007
WHO Blue Book	Classification of Tumors of Endocrine Organs	4th ed	2017
WHO Blue Book	Classification of Tumours of the Central Nervous System	4th ed	2016
WHO Blue Book	Classification of Tumours of the Eye	4th ed	2019
Bigner, Johnston	Cytopathology of the Central Nervous System	1st ed	1994
Joseph	Diagnostic Neuropathology Smears	1st ed	2007
Thapar et.al	Diagnosis and Management of Pituitary Tumors	1st ed	2001
Burger, Scheithauer	Diagnostic Pathology: Neuropathology	1st ed	2012
Burger, Scheithauer	Diagnostic Pathology, Neuropathology	2nd ed	2016
Okazaki	Fundamentals of Neuropathology	1st ed	1983
Love, Budka, Ironside &	Greenfield's Neuropathology (2 volume)	9th Ed	2015

Perry			
Love, Louis, Ellison	Greenfield's Neuropathology (2 volume)	8th ed	2008
Love, Louis, Ellison	Greenfield's Neuropathology (2 volume)	7th ed	
Love, Louis, Ellison	Greenfield's Neuropathology (2 volume)	6th ed	
Welsh	Intra-Operative Neuropathology for the Non-Neuropathologist	1st ed	2012
Gray	Manual of Basic Neuropathology (4 copies)	5th Ed	2014
Gray, DeGirolami, Poirier	Manual of Basic Neuropathology (4 copies)	6th ed	2019
Poirier, Gray, Escourolle	Manual of Basic Neuropathology	6th ed	2019
Fetter et. Al	Mycoses of the Central Nervous System	1st ed	1967
Prayson	Neuropathology (Foundations series)	2nd ed	2011
Prayson	Neuropathology (Foundations series)	1st ed	2005
Prayson	Neuropathology Review	2nd ed	2008
Garcia	Neuropathology: the Diagnostic Approach	1st ed	1997
Love	Neuropathology: A Guide for practicing Pathologists		2001
Ellsion et al	Neuropathology: a reference text of CNS pathology	2nd ed	2004
Dawson et al	Neuropathology Techniques	1st ed	2003
Esiri	Oppenheimer's Diagnostic Neuropathology	2nd ed	1996
Esiri, Perl	Oppenheimer's Diagnostic Neuropathology	3rd ed	2006
McLendon et al	Pathology of Tumors of the Central Nervous System	1st ed	2000
Armstrong et al	Pediatric Neuropathology: a Text-Atlas	1st ed	2007
Prayson, Cohen	Practical Differential Diagnosis in Surgical Neuropathology	1st ed	2000
Fuller, Goodman	Practical review of neuropathology	1st ed	2001
Perry & Brat	Practical Surgical Neuropathology	1st ed.	2010
Perry & Brat	Practical Surgical Neuropathology	2nd ed	2018
Nelson et al	Principles & Practice of Neuropathology	2nd ed	2003
Nelson et al	Principles and Practice of Neuropathology	1st ed	1993
McLendon et al	Russell & Rubenstein Pathology of Tumors of Nervous Syst	7th ed	2006
Burger	Smears & Frozen Sections	1st ed	2009
Burger, Scheithauer, Vogel	Surgical Pathology of Nervous System and its Coverings	4th ed	2002
Burger, Scheithauer, Vogel	Surgical Pathology of Nervous System and its Coverings	3rd ed	1991
Davis & Robertson	Textbook of Neuropathology	2nd ed	1991
McLean et. Al	Tumors of the Eye and Ocular Adnexa	3rd ed	1994
WHO Blue Book	Tumors of Hematopoietic & Lymphoid Tissue	4th ed	2008
Asa	Tumors of the Pituitary Gland	3rd ed	1998
Asa	Tumours of the Pituitary Gland	4th ed	2011
WHO Blue Book	Tumors of Soft Tissue & Bone	4th ed	2013
Kurian, Moss & Camelo-Piragua	Atlas of Gross Neuropathology: A Practical Approach	1st Ed	2014
Hilton, Shivane	Neuropathology Simplified; A Guide for Clinicians and Neuroscientists	1st Ed	2015
Blumcke, Sarnat, Coras	Surgical Neuropathology of Focal Epilepsies: Textbook and Atlas	1st Ed	2015
Burger, Scheithauer	Tumours of the Central Nervous System	4th Series	2007
Louis, Frosch, Mena, Rushing, Judkins	Non-Neoplastic Diseases of the Central Nervous System	1st Series	2009s
WHO Blue Book	Tumours of the Central Nervous System – **3 COPIES**	5th Editionj	2021
MUSCLE PATHOLOGY			

Dubowitz, Sewry	Muscle Biopsy: a Practical Approach	4th Ed	2012
Dubowitz, Sewry	Muscle Biopsy: a Practical Approach	3rd ed	2007
Carpenter, Karpati	Pathology of Skeletal Muscle	2nd ed	2001
Adams	Diseases of Muscle	3rd ed	1975
Sarnat	Muscle Pathology & Histochemistry		1983
McComas	Neuromuscular Function & Disorders	1st ed	1977
Goebel, Sewry, Weller	Muscle Disease	2nd Ed	2013
PERIPHERAL NERVE			
Dyck, Thomas	Peripheral Neuropathy (2 volume)	4th ed	2005
Oh	Color Atlas of Nerve Biopsy Pathology	1st ed	2002
King	Atlas of Peripheral Nerve Pathology	1st ed	1999
Midroni, Bilbao	Biopsy Diagnosis of Peripheral Neuropathy	1st ed	1995
Asbury, Johnson	Pathology of Peripheral Nerve (Major Problems series)	1st ed	1978
Scheithauer, Woodruff, et al.	AFIP Atlas of tumors of the peripheral nervous system	3rd ser	1999
Bilbao, Schmidt	Biopsy Diagnosis of Peripheral Neuropathy	2nd Ed.	2015

ELECTRON MICROSCOPY (additional EM books available in AP resident library)			
Dickersin	Diagnostic electron microscopy Text / Atlas	2nd ed	2000
Dolman	Ultrastructure of Brain Tumors and Biopsies (EM Atlas)	1st ed	1984
Ghillaidy	Ultrastructural Pathology of the Cell and Matrix Vol 1 & 2	EBook only	
NEURODEGNERATIVE DISEASE			
Dickson, Weller	ISN series: Neurodegeneration	2nd ed	2011
Markesbery	Neuropathology of dementing disorders	1st ed	1998
Duckett, DeLaTorre	Pathology of the Aging Human Nervous System	2nd ed	2001
FORENSIC PATHOLOGY			
Oehmichen, Auer, Konig	Forensic Neuropathology and Neurology	1st ed	2006
Kovacs	Neuropathology of Degenerative Diseases: A Practical Guide	1st ed	2015
Dolinak & Matshes	Essential Forensic Neuropathology	1st Ed	2010
Itabashi	Forensic Neuropathology: A Practical Review of the Fundamentals		2007
Witwell, Milroy, du Plessis	Forensic Neuropathology	2nd ed	2021
CLINICAL NEUROLOGY / NEUROSCIENCE			
Victor, Ropper	Victor and Adam's Principles of Neurology	7th ed	2001
Paxinos, Mai	The Human Nervous System	2nd ed	2004
Haines	Fundamental Neuroscience for Basic/Clinical applications	3rd ed	2006
Kandel	Principles of Neural Science	5th ed	2012
Haines	Fundamental Neuroscience for basic and clinical applications	4th Ed	2013
NEUROIMAGING			
Osborn	Diagnostic Imaging Brain	1st ed	2004
Osborn	Diagnostic Neuroradiology	1st ed	1994
Gokden, Kumar	Neuropathologic and Neuroradiologic Correlations	1st ed	2017
Yousem, Grossman	Neuroradiology: The requisites	3rd Ed	2010

GENERAL SURGICAL PATHOLOGY (some updated editions available in AP resident library)			
Mills	Sternberg's Diagnostic Pathology (2 volume)	4th ed	2004
Tubbs & Stoler	Cell and Tissue Based Molecular Pathology (Foundations)	1st ed	2009
Kumar, Abbas & Aster	Robbins & Cotran Pathologic Basis of Disease	9th ed	2015
Schniederjan & Brat	Biopsy Interpretation of the Central Nervous System		2011
Kinkus	Laboratory Management: Quality in Laboratory Diagnosis	1st ed	2012

Neuropathology Kindle sign-on for eBooks:
Username: uofc.neuropathology@gmail.com
Password (case sensitive): Neuropathology

TEMPLATES & SYNOPTICS

NB: Please see the *following network Drive for updated synoptics: G://clsdata/Neuropathology Synoptics*.

SCOPE: All Neuropathology Residents enrolled in the Neuropathology Residency Training Program, University of Calgary & Calgary Laboratory Services.

PURPOSE: To provide sample synoptic for the writing of Neuropathology Reports within the Section of Neuropathology.

LIST OF TEMPLATES AND WORKSHEETS:

1. Autopsy Brain Gross Worksheet
2. Autopsy Fetal-Perinatal Gross Worksheet
3. Autopsy Forensic Template
4. Autopsy Pediatric Forensic Template
5. Autopsy Pediatric Templat
6. Autopsy Template
7. Carotid Plaque Protocol

LIST OF SYNOPTIC REPORTS

1. Astrocytomas
2. Carotid Plaque
3. Choroid Plexus Neoplasms
4. Clot
5. Ependymomas
6. Epilepsy Hippocampus
7. Germ Cell Tumors
8. Gliomas
9. Hematologic Neoplasms
10. HPC & SFT
11. Lymphoma
12. Meningeal Tumors
13. Metastatic Tumors
14. Miscellaneous Tumors
15. Muscle Adult
16. Muscle Pediatric
17. Nerve Biopsy
18. Nerve Tumors
19. Neuronal & Primitive Tumors
20. Oligodendrogliomas
21. Pilocytic Astrocytoma
22. Pituitary
23. Temporal Artery Biopsy
24. Vascular Malformation

RESIDENT FORMS

SCOPE: All Neuropathology Residents enrolled in the Neuropathology Residency Training Program, University of Calgary & Calgary Laboratory Services.

PURPOSE: To provide a list of the ITERs and Forms used within the Neuropathology Residency Training Program. You can obtain copies of these forms from One45 or the Program Administrator.

LIST OF FORMS:

- RESIDENT TIME OFF REQUEST FORM
- APPLICATION FOR RESIDENT TRAVEL FUND APPROVAL (U OF C)
- PRECEPTOR EVALUATION FORM
- PROGRAM EVALUATION FORM
- RESIDENT TEACHING/PRESENTATIONS EVALUATION FORM
- CHIEF RESIDENT EVALUATION FORM

LIST OF ITERs:

- NEUROPATHOLOGY(CORE) (PGY 3-5)
- INTRODUCTION TO NEUROPATHOLOGY (PGY1)
- EMERGENCY MEDICINE (PGY1)
- ENT (PGY1)
- FORENSIC PATHOLOGY (PGY1)
- GENERAL SURGERY – TRAUMA (PGY1)
- GERIATRICS (PGY1)
- INTERNAL MEDICINE (PGY1)
- NEUROLOGY (PGY1)
- NEUROONCOLOGY (PGY1)
- NEURORADIOLOGY (PGY1)
- NEUROSURGERY (PGY1)
- NICU (PGY1)
- ANATOMIC PATHOLOGY INTRODUCTION (PGY1)
- PEDIATRIC NEUROLOGY (PGY1)
- PEDIATRICS (PGY1)
- FORENSIC PATHOLOGY (PGY1, 2 &4)
- HEMATOPATHOLOGY (PGY2)
- CYTOPATHOLOGY (PGY 2)
- AUTOPSY (PGY 2)
- SURGICAL PATHOLOGY (PGY 2)
- FORENSIC PATHOLOGY (PGY 2)
- NEUROCYTOLOGY (PGY4)
- RESEARCH

RESIDENCY TRAINING IN NEUROPATHOLOGY

ASSOCIATIONS, CONFERENCES & MEETINGS

The Neuropathology Residency Program fully supports each individual resident in actively seeking out membership in learned societies. If a letter of support is required to obtain a junior membership please contact your Program Director, Assistant Program Director or Program Administrator to obtain one.

National and International Professional Societies in which Residents Participate.

Conferences regularly attended by neuropathology trainees as well as others presenting neuropathological studies (neurology, neurosurgical and anatomical trainees) include:

- Canadian Association of Neuropathologists
- Canadian Association of Pathologists
- Canadian Congress of Neurological Sciences
- American Association of Neuropathologists
- International Academy of Pathology (Canadian/U.S. division)
- International Congress of Neuropathology (when in North America)

Opportunities to attend outside conferences:

Residents in their PG3, PG4 and PG5 years are encouraged and indeed expected to complete a research paper appropriate to their rotation and interests. The Neuropathology Training Program will provide full funding for all appropriate expenses for a Resident who is first author on a paper and presenting at a North American Conference up to a cap of $2,000.00 per claim.

USCAP

www.uscap.org

CAP/ACP

WWW.cap-acp.org

The Banff Conference

http://banffpathology.ucalgary.ca/

ICRE

http://icreblog.royalcollege.ca/about-icre/

The International Conference on Residency Education (ICRE) is a recently developed conference sponsored by the Royal College of Physicians and Surgeons of Canada. This one-of-a-kind annual meeting (held in rotating cities in Canada) provides workshops, lectures, and scientific presentations that deal entirely with issues related to post-graduate medical education. Special programs/workshops for Program Administrators, Program Directors, and Chief Residents are also offered.
PGME is prepared to offer funding to support a Chief or Senior Resident to attend this meeting. For details on funding support, please visit the PGME website or ask your Program Administrator.

RESIDENCY TRAINING IN NEUROPATHOLOGY

Canadian Association of Neuropathologists

http://www.canp.ca/

The Canadian Association of Neuropathologists (CANP) is a non-profit professional organization with an international membership. The Association exists to promote the highest professional standards among Neuropathologists and to act as a source of scientific communication and education in the field of Neuropathology.

We encourage you to browse our site to learn more about the CANP and Neuropathology in general.

American Association of Neuropathologists

http://www.neuropath.org/

(AANP) began in the early 1930's as a professional and educational organization representing American neuropathologists. It was incorporated in the State of Pennsylvania in May 1960. The AANP's purpose is to advance the science, teaching and training of the diseases of the nervous system and the practice of neuropathology. Currently, AANP has more than 800 members.

Examinations

Mock Exams

Dates administered: Winter (FULL) and Late Spring (HALF) yearly

General Format:
~50 PowerPoint based images
~50 glass slides
Written questions broken down as follows:
17 x 10 pts each
9 x 20 pts each
3 x 15 pts each

NPISE

Dates Administered: Spring and Fall Yearly

Sample Content Outline

Content:

- Anatomy / Histology
- Demyelinating
- Eye
- Infectious
- Laboratory Operations and Management
- Muscle/Nerve
- Neurodegenerative
- Pediatric / Development
- Toxic/Metabolic
- Trauma/Forensics
- Tumors
- Vascular

Format: Fellow In-Service Neuropathology Examination is an online exam containing at least 60 questions. Completion time is 1 hour and 45 minutes

Miscellaneous

Welcome BBQ

New residents arrive July 1st of each year. The welcome party for new residents (and staff, if appropriate) typically occurs in July, and, weather permitting, includes an outdoor BBQ and informal activities for the new residents and staff and their families. The get together serves to introduce the new residents and staff to the department, and to provide all with an opportunity to socialize with their families outside the usual milieu of the hospital.

Resident's Retreat

A resident retreat in Banff is planned on alternating, even numbered years (2010, 2012, etc.). The retreat has historically been combined with the Ski Day, making for a 2-3 day all-inclusive event. Topics for the Retreat have varied over the years, and have included things as diverse as "Research", "The History of Medicine", and "Career Planning". Accommodations, travel, meals, and costs related to the Ski Day (lift tickets, equipment rentals) are provided for the Friday and Saturday that the residents are in Banff. Family members are welcome to attend the social activities, but family costs (apart from the banquet) must be covered by the resident.

Outdoor Day

This optional day of outdoor recreational activity can be scheduled at any time during the winter, but typically occurs in February or March. The activity (and location) is selected and organized by the resident's group (spearheaded by the Chief), and funded by the RTC Budget. Although this event is traditionally been known as "Ski Day", the activity chosen might be cross-country skiing, snowshoeing, downhill skiing, or even a simple mountain hike.
Ski Day is typically planned for a Friday, and those residents attending the activity are relieved of their educational and service commitments. Those choosing not to take advantage of Ski Day are expected to attend to their usual service commitments. Ski Day is normally concluded with an informal dinner either hosted by a staff person, or held in a restaurant.
On alternating years, the Ski Day is combined with a Resident's Retreat

Mentoring

Mentorship Guidelines

Definition

- A mentor is a person who accepts facilitating an individual's learning by assisting, supporting, and guiding him or her. The mentor carries out activities as requested by the learner.

Who is eligible to be a mentor?

- Principally, all pathologists (GFT/Non-GFT) are eligible to be mentors for one or more pathology residents.

How is the mentor selected?

- The resident chooses a mentor from a list of pathologists that have agreed to function as such for residents when she or he feels that support is needed. Selecting a mentor at any time is not mandatory.

Mentorship Role

- The mentor may act as a teacher, advocate, and friend of the resident.
- The mentor may suggest informal meetings/contact in regular or irregular intervals in order to "touch base" as well as approach the resident when help may be needed for the duration of the mentorship. However, overall, the mentor should seek a passive role and leave it to the resident to determine the extent of the contact. There is no obligation for the resident to involve his or her mentor in professional or personal issues. Conversely, the resident must respect the mentor's other work commitments and his or her privacy.
- The mentor should establish a welcoming, not intimidating atmosphere and encourage open communication
- The mentor should listen, support and motivate the resident in his or her goals and provide guidance, advice and suggestions if asked for.
- The mentor cannot be held responsible if the resident is not successful in examinations, in completing the program or in any other tasks.
- Termination of Mentorship
- The mentorship lasts for as long as the resident feels she or he requires the support of the mentor. A resident may have more than one mentor at one time (for example, one to address issues regarding research, and another one regarding

personal issues). However, involving more than one mentor for the same issue at the same time is not sensible, unless these mentors are aware of each other and work as a team to support the resident.

- The staff member can also terminate the mentorship. He or she should be encouraged to give reasons when doing so.

Assessment of the Mentor
The mentor should be assessed in a similar fashion as preceptors of rotations are evaluated. If you choose to engage with a mentor please inform the Program Administrator and the Program Director in writing to ensure that the proper documentation is generated.

Links

http://careers.bmj.com/careers/advice/view-article.html?id=20008422

Wellness

http://cumming.ucalgary.ca/pgme/resident-wellbeing

Resident Rotators in Neuropathology

The Neuropathology program provides a rotation experience to many other resident trainees on a first come first served basis. The Schedule is complied, created and managed by the Program Administrator and distributed to the Neuropathology Staff and residents when changes are made.

For access to the laboratory to be granted the following information must be provided to the Program Administrator prior to the start of the rotation:

- Swipe Card Number
- First Name
- Last Name
- Gender (this is to assign them to the proper change room in the Morgue)
- Indicate last day in rotation so access to the morgue can be discontinued