UNIVERSITY OF ALBERTA
FACULTY OF MEDICINE & DENTISTRY
Department of Laboratory Medicine & Pathology

Alberta Health Services

PEDIATRIC PATHOLOGY FELLOWSHIP PROGRAM

The Department of Pathology and Laboratory Medicine
University of Alberta, Faculty of Medicine and Dentistry and
Alberta Health Services

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Program Description:

The Fellowship Program in Pediatric Pathology at the University of Alberta (UAH/Stollery Children's Hospital and Royal Alexandra Hospital) is tailored to the career needs of the individual fellow. For the typical graduate of a pathology training program, rotations through pediatric, perinatal and embryofetal autopsy and surgical pathology are mandatory, while elective rotations for research and/or through different subspecialties may be negotiated during the one year Fellowship. There are approximately -3000 pediatric surgicals, 50-100 non-gynecologic cytology specimens, 1800 placentas, and 80-130 perinatal/pediatric autopsies per year. Embryofetal and developmental pathology, perinatal pathology, cardiac pathology, neuropathology, renal pathology, electron microscopy, genetics, metabolic disease and neoplasia are emphasized.

The faculty of 4 M.D.'s and 1 M.D, Ph.D. provide expertise in all aspects of developmental pathology including Cytogenetics. The Clinical Oncology and Pediatric Pathology Programs participate in the Children's Oncology Group (COG) Protocols. Fellows will be expected to participate in the teaching programs of the University during which they supervise junior fellows and undergraduate medical students.

A minimum of 4 years of anatomic pathology OR 2 years of anatomic pathology and 2 years of general (clinical) pathology OR 2 years of pediatric residency plus 2 years of anatomic Pathology is required (see also Educational Goals below). Letters of recommendation from three faculty members having direct supervisory roles in the candidate's training program and a transcript of the medical school record are required. A personal interview is offered to those whose credentials are deemed suitable.

How to Apply

Early application is important to arrange interviews before a December 1 decision of the preceding year. Call, email or write with letters of interest and a curriculum vitae to:

Atilano Lacson, M.D., FRCPC
Clinical Professor of Pathology and Adjunct Clinical Associate Professor in Pediatrics
UAH/Stollery Children's Hospital
8440-112 Street,
Walter McKenzie Health Sciences Centre
Edmonton, Alberta T5J 2B3
Phone: 780-407 2716
Fax: 780-407-3009
E-mail: Lacson@ualberta.ca

OR

Consolato M. Sergi, M.D., FRCPC
Associate Professor of Pathology and Adjunct Associate Professor in Pediatrics
UAH/Stollery Children's Hospital
8440-112 Street,
Walter McKenzie Health Sciences Centre
Edmonton, Alberta T5J 2B3
Phone: 780-407 2716
Fax: 780-407-3009
E-mail: sergi@ualberta.ca

Applicants must be graduates of Canadian, U.S. or other international medical schools and must have passed steps 1 and 2 of U.S. MLE and/or the ECFMG. International applicants must possess a valid Canadian visa. A Canadian license is preferable but not required.

The following items are needed to complete application:

- Personal statement
- Curriculum Vitae
- Three written letters of references
- Registration with the Post-Graduate Medical Education Office (see appendix A and the following link: http://www.med.ualberta.ca/Library/Documents/Education/PGME/fellows_registration_form.pdf

Deadline for applications: Open

Process of appointment:
After initial communication with the program director and favorable review of the application, applicants are invited to the University of Alberta/Stollery Children's Hospital for interviews with faculty, either in person or through electronic real time communication. No applicant will be considered without an interview. A faculty committee on Pediatric Pathology Fellowship Program makes the selection of applicants.

Following selection, the application and other documents are submitted to the Assistant Dean for Graduate Education for verification of medical school training and other credentials. After credentials verification, the applicant will be notified of any additional requirements.

The application will then be processed by the Department of Graduate Medical Education and the applicant is notified.

Educational Goals and Philosophy

Most pediatric pathologists typically practice pediatric surgical pathology, embryofetal and placental pathology, with a working knowledge of the relevant genetics, cytogenetics and molecular pathology information. This paradigm forms the core of the UAH/Stollery Children's Hospital's pediatric pathology fellowship program. Our program provides ample opportunity to develop teaching skills and to participate in clinical collaborative or translational research.

The goal of the program is to enable trainees to practice pediatric pathology either in a general hospital or in a dedicated or free-standing children's hospital. The fellowship is offered at the PGY-5 level. Thus, the minimum requirement for admission to the program is four (4) years of anatomic pathology training, OR three years of AP and one year of CP, OR three years of AP plus one year of Clinical Pediatrics. One year of training in our program may be used toward AP or AP-CP RCPSC certification.

Pediatric pathology practice differs in many respects from adult pathology, and preparation for it requires extensive exposure to high volume and diverse material. This can be best obtained at a children's hospital and a high-risk obstetric facility with access to a full range of state-of-the-art laboratory support services. Our program offers such an experience. Fellows are supervised, in rotation, by all participating staff and faculty members in order to get the benefit of the subspecialty expertise that is available in the region, and be exposed to different points of view. They participate in clinical consulting activities of the staff and in all teaching activities in which the regional laboratory services and university pathology department is involved. Clinical research is a requirement and time allotment is provided.

Curriculum - Required Rotations

- Pediatric Anatomical Pathology (UAH/Stollery Children's

  Six months at the University of Alberta/Stollery Children's Hospital Department of Laboratory Medicine and Pathology. This entails surgical pathology and autopsy pathology combined.

- Perinatal and Embryofetal Pathology, Royal Alexandra Hospital

  Three months at the Royal Alexandra Hospital where the fellow will be immersed in fetal and placental pathology, taking an active role in diagnostic activities.

- Research

  A two month research rotation will be provided with prior approval from the program director and the proposed project supervisor, pending the submission of an acceptable research project at or near the beginning of the fellowship program.

Curriculum – Elective Rotations

A four (4) week rotation in another subspecialty of the Fellow's choosing may be taken with prior approval from the Director of the respective programs with a pediatric slant (e,g. Renal Pathology, Neuropathology, Hematopathology, Clinical Laboratory specialty, Molecular Pathology and Clinical and Cytogenetics)

HOLIDAYS (PLEASE REFER ALSO TO CANADIAN NATIONAL HOLIDAYS AND ALBERTA PROVINCIAL HOLIDAYS):

Vacation is four weeks (20 working days). Additional time for local, national or international meetings (conferences and continuing education) can be negotiated particularly if the fellow attends such meetings as an active participant by presenting his/her project.

Pediatric Anatomical Pathology Rotation

(See separate CANMEDS-formatted Objectives Document for this Fellowship)

Goals and Objectives: At the end of this fellowship, the fellow will be able to:

1. Describe the molecular and structural pathogenesis of commonly encountered pediatric and embryofetal diseases.

2. Provide clear, concise and timely diagnoses and propose further clinical guidance on disease processes encountered in the embryo, fetus, neonate, infant and child.

3. Approach clinical and research questions in pediatric disease with intellectual curiosity, and propose problem-solving techniques, where available.

4. Implement appropriate technical skills necessary to practice pediatric, neonatal and embyofetal pathology independently.

5. Utilize effective teaching and communication skills along with appropriate management skills in the practice of pediatric, neonatal and embryofetal pathology.

These goals are met by involving the fellows in the day-to-day professional activities of the section of Pediatric Pathology under direct faculty supervision and by providing additional structured training in the form of conferences, didactic teaching activities, and supplemental teaching aids. Additional opportunities for teaching responsibilities will be provided. The fellow will be expected to acquire graded responsibilities as the fellowship training progresses.

Duration of Rotation: Thirty (30) weeks.

Description of Rotation and Duties and Responsibilities of the Fellows
Fellows begin with surgical, embryofetal and placental pathology on a continuous basis; they perform pediatric and fetal autopsies and participate in pediatric and other specialty pathology activities. The program directors at both sites are responsible for managing the fellows' time and schedule and making sure that a) (s)he is not overworked while on surgicals and b) (s)he has adequate time for autopsies, and specialty pathology.

The goal of the anatomical pathology rotation is to have the fellow examine, at a minimum, approximately 1500 surgicals, perform 25-50 intraoperative consultations, examine 200 placentas, and perform up to 40 pediatric and embryofetal autopsies.

Surgical Pathology
While on the surgical pathology service, fellows receive, describe and process all surgical specimens, under faculty supervision with graded responsibility toward the second half of the program. The surgical pathology service includes placental pathology, examination of first trimester products of conception (submitted for chromosome analysis), and medical, non-gynecologic cytology. Staff pathologists rotate on surgical pathology duties in blocks of one to three weeks at a time at the University site. Thus there is always a staff pathologist assigned to supervise and assist the fellow. Surgical cases are assigned to the fellow who studies them and presents his findings and proposed diagnoses to the staff pathologist on call for assessment and diagnosis, using the multihead microscope. Fellows are required to keep abreast of potential intraoperative consultations in the OR schedule each day, review the electronic medical record and x-rays of the cases, and prepare for the intraoperative consultation. The frozen section is prepared by the technologist and examined by the fellow and the on-call staff pathologist. Consultation with other staff pathologists may also be obtained at that time. The results are then communicated to the surgeon.

Two weeks of hands-on EM training is included in this rotation.

A total of over 4000 pediatric surgical and placental specimens were accessioned in 2013 at the UAH and RAH that includes material reflecting the full spectrum of pediatric and developmental pathology covering all organ systems. The UAH Pathology Department is a regional referral center for diagnostic electron microscopy, neuropathology, and renal pathology. An IHC laboratory located in the University campus at Cross Cancer Institute processes most of the diagnostic immunopathology testing.

Ancillary Studies
Stollery Children's Hospital is a member of the Children's Oncology Group (COG) and the pediatric hematology/oncology program conducts clinical trials based on COG protocols; pediatric pathology is an essential part of this activity. To this end, the pathology department supports this participation by providing necessary equipment to handle ancillary procedures required by COG, in conjunction with histological assessments prior to central COG review, including frozen section diagnoses, tumor and tissue banking through the CCI tissue bank, paraffin section preparations, immunohistochemistry, electron microscopy and molecular analyses along with other sampling requirements for open COG protocols for biologic studies and therapeutic trials. The ability to appropriately triage tissue samples in anticipation of this need is emphasized from the beginning of the fellowship.

Placental Pathology
The placentas from high-risk pregnancies as well as pregnancies complicated by various factors (maternal, fetal, placental) that are delivered at the Royal Alexandra Hospital (RAH) are submitted to Department of Pathology at the RAH for pathological examination. These include placentas for infants admitted to the Neonatal Intensive Care Unit. The Royal Alexandra Hospital accessioned close to 2000 placentas in 2013 as surgical pathology specimens and over 400 products of conception specimens for the same period.

Autopsy Pathology
The staff pathologist who is the prosector of record in each pediatric autopsy supervises the fellow. The degree of supervision depends on the case complexity and experience of the fellow. The fellow reviews

and summarizes the clinical history, performs the prosection with assistance and under supervision, as necessary, dictates the gross description, release a preliminary report within 24-48 hours, examines the histology slides, requests additional studies where indicated, and presents the case to the staff pathologist for discussion. Once all data are complete and available, a final report is released.

Cardiac Pathology
A small collection of cardiac specimens is available for hands on examination, along with properly catalogued photographic collections of various anomalies. A number of pediatric autopsies are on cardiac patients who succumb either preoperatively or post-operatively. These cases are used as teaching material for fellows to gain some mastery of the sequential segmental analysis of the heart using recognized procedures. A special rotation through the Calgary Children's Hospital for the purpose of examining their extensive heart collection may be negotiated.

Embryofetal Pathology
The Department of Pathology at Royal Alexandra Hospital performs most of the embryofetal pathology in the region, with cross-coverage from Red Deer Regional Hospital. This fetal pathology service receives spontaneous and therapeutic fetal terminations for medical reasons submitted from the obstetric unit at the Royal Alexandra Hospital and from other outlying regional hospitals in order to determine the cause of fetal loss, confirms prenatal diagnoses, and evaluate cases for possible genetic abnormalities or other pathological conditions that may have implications for future pregnancies. First trimester spontaneous abortions (POCs) are commonly processed with the routine surgical specimens. Fetuses less than 20 weeks gestation may be submitted fresh with their placentas or in a fixed state when transported from outlying areas. When there is consent for autopsy, these specimens are examined using a protocol that may include skeletal x-rays (babygram), photography, chromosome analysis, DNA banking and/or other studies if indicated.

The final diagnosis requires an integration of anatomical findings with cytogenetics and correlation of these with prenatal ultrasonographic and clinical findings. Medical Geneticists, Neonatologists, and Perinatologists at the Royal Alexandra Hospital work closely with high risk Obstetricians and provide counseling to parents. Fellows on rotation will assist in performing the fetopsies and all other procedures related to fetal evaluations under staff supervision. They may communicate with genetic counselors, perinatologists and obstetricians through graded responsibility. They are invited to attend a monthly multi-disciplinary Perinatal Mortality and Morbidity conference in which the results of embryofetal and neonatal autopsies are presented from time to time.

Forensic Pathology
Forensic autopsies with legal implications such as infant death with no prior disease, trauma, burns and others are done at the Regional Medical Examiner's (ME) Office. Through an arrangement with the ME office, fellows may attend, at the discretion of the ME office, participate in the periodic provincial death reviews throughout the fellowship.

Teaching Aid
The AP rotation and attendance at educational and clinical conferences expose the fellow to a large variety of clinical and pathologic material. Given the rarity of some pediatric disorders, there may be gaps in this experience. These gaps are filled through required review of departmental teaching files (slide and kodachrome sets and museum specimens of gross pathology). The sets include slides from the departmental archives, slides acquired through attendance at various national and regional meetings, and slides from the Society for Pediatric Pathology Slide Survey Program, a national proficiency program.

Together with slide sets that are used for medical school teaching, this material covers every conceivable pediatric pathology entity. These collections are organized by organ system and are accompanied by anonymized copies of the final reports and brief clinical notes. Fellows are assigned to review this collection. Review of slide sets can help in the preparation for the US board examinations.

Recommended Reading
The following textbooks are recommended for review during the AP rotation:

Berry: Pediatric Pathology
Wigglesworth and Singer: A Textbook of Fetal and Perinatal Pathology
Stocker and Dehner: Pediatric Pathology
Gilbert-Barness: Pathology of the Fetus and Infant.
Keating: Fetal and Neonatal Pathology
Stocker and Dehner: Pediatric Surgical Pathology
Benirschke and Kaufman: Pathology of the Human Placenta
Naeye: Disorders of the Placenta, Fetus and Neonate
Nelson: Essentials of Pediatrics

Additional textbooks are available in individual pathologists' offices.

Expectations

At the end of the Pediatric Anatomical Pathology rotation, fellows should, at a minimum, have the following knowledge and skills:

General: Independently perform neonatal and fetal autopsies, obtain samples for cultures, cytogenetics and molecular studies. Triage pediatric tumor specimens for histological, ultrastructural, cytogenetic and nucleic acid analysis. Develop timely, accurate, clear and concise reports of his/her findings.

Electron microscopy (EM): Describe the steps involved in electron microscopy from specimen receiving to reporting. Examine EM specimens independently and differentiate between normal and altered cellular ultrastructure either by disease or by artefacts in preparation. Describe tumor cytodifferentiation characteristics, viral particles, immotile cilia syndrome, lysosomal and other storage diseases in various organs, and other commonly encountered ultrastructural pathology.

Congenital Malformations: Discuss the recurrent somatic features of commonly encountered syndromic and non-syndromic phenotypes of malformations including those due to chromosomal aberrations such as trisomy 13, 18, 21, and Turner syndrome. Describe the principles underlying the classification of various skeletal dysplasias. Discuss the morphogenesis of common isolated organ malformations (see below).

> Cardiac Pathology: Describe the commonly seen anomalies of the heart, including one-sided cardiac hypoplasia, communicating defects (e.g., ASD, VSD, Tetralogy of Fallot), isolated valvular defects including Ebstein anomaly, great vessel abnormalities such as coarctation of the aorta, and patent ductus arteriosus, among others. Discuss and perform the sequential segmental analysis of the heart (see above).

Lung Pathology: Describe and teach the essential features and pathogenesis of HMD, BPD, lung hypoplasias, sequestration, cystic adenomatoid malformation, bronchogenic cyst, cystic fibrosis, and childhood interstitial diseases among others.

GI Pathology: Describe hallmarks of inflammatory bowel disease, necrotizing enterocolitis, Hirschsprung disease, and esophagitis (reflux, eosinophilic, infectious). Describe the pathophysiology of various intestinal malformations including atresias, duplications, etc.

Hepatobiliary/Pancreas: Describe and teach the characteristic findings in various liver diseases seen in infancy and childhood including so-called "neonatal giant cell hepatitis" and extrahepatic biliary atresia, in the spectrum of "obstructive cholangiopathies". Explain the differential diagnoses among various metabolic disorders as they involve the liver (e.g., alpha-1-antitrypsin deficiency, Wilson's disease, cystic fibrosis, biliary cystic disease, familial cholestasis, NASH, and others).

Genitourinary: Describe the clinical and pathologic features associated with various forms of cystic renal diseases in newborns and children, including cystic renal dysplasia, genetic forms of renal cystic diseases and tumors of the urinary tract unique to infants and children.

Hematopoietic: Describe the current classification of pediatric hematolymphoid neoplasms, including those that involve soft tissue and bone lesions, Hodgkin's and non-Hodgkin's lymphomas, Langerhans histiocytosis, other histiocytic disorders, and other, according to modern, risk stratification schemes that take molecular genetic information into account.

Pediatric Solid Tumors: Describe and classify commonly encountered pediatric solid tumors, synthesizing date acquired from morphologic, cytogenetic, molecular, and clinical data. Characterize features of so-called malignant "embryomas" (e.g., neuroblastoma, PNET/Ewings sarcoma, Wilms tumor, alveolar and embryonal rhabdomyosarcoma.

Placenta: Develop a proficiency in evaluating placentas including skills in describing the pathogenesis and clinical implications of commonly seen placental lesions. This includes a proficiency in selecting and collecting samples from villi for cytogenetic analysis.

Dermatopathology: Describe the features and classification schemes of melanocytic lesions in childhood, congenital dermatoses, inflammatory and other skin disorders in childhood including those that may have a genetic basis.

Infectious Disease: Describe and classify the lesions that can be seen in congenital and acquired viral, bacterial fungal and other infections/infestations.

Faculty Responsible for Supervision and Instruction

Atilano G. Lacson, M.D., FRCPC, Consolato Sergi, M.D., PhD, FRCPC (Pediatric Pathology)
Nenad A. Lilic, M.D., Laurie Russell, M.D., FRCPC , and Suzanne Chan, M.D., FRCPC [Perinatal Pathology, Royal Alexandra Hospital].

Supervision and Evaluation

A staff pathologist is directly responsible for supervising the fellows during the fellowship and on specific

rotations. Fellows are given graded responsibility in performing autopsies and surgical pathology reporting, after a staff pathologist reviews their work and signs out the final reports. Staff pathologists also evaluate fellow performance at the end of each rotation. Formal written evaluations are done every six months. A written examination will be required at the end of the year.

Electron Microscopy Rotation

Goals and Objectives

1. Characterize the appropriate indications and use of Electron Microscopy for diagnosis and research.

2. Describe all aspects of tissue processing and Electron Microscopy technique so the fellow can procure and ship specimens under optimal conditions and operate the electron microscope semi-independently.

3. Describe the basic normal and pathological ultrastructural appearances of subcellular elements with emphasis on pediatric disorders.

Duration of Experience: 2 weeks

Description of Rotation and Duties and Responsibilities of the Fellows
The EM Laboratory accessions samples from area hospitals, being the only service EM laboratory in the region. Most of these samples come from the UAH/Stollery Children's Hospital, representing a highly selected group of the most interesting surgical and medical specimens such as solid tumors, liver, kidney, nerve and muscle biopsies, respiratory mucosa biopsies for evaluation of cilia and others. The rest were submitted from regional hospitals and consisted of kidney, muscle and nerve biopsies, tumors and miscellaneous other specimens. Electron Microscopy is also used in conjunction with pediatric and fetal autopsies.

The EM laboratory includes a Hitachi H-600 electron microscope with digital image acquisition and processing, ample space and equipment for tissue processing and microtomy, and extensive archived teaching material. The equipment is being replaced and updated in 2009. The EM suite includes a full digital imaging station. In addition to processing EM images, this station can acquire and process gross and light microscopic images and images obtained from scanning kodachromes, prints and radiology films. A highly experienced technician staffs the laboratory. In addition, computers in the photographic section have Adobe Photoshop, Microsoft PowerPoint and other image processing software. The fellows can use this station to prepare their presentations. A highly experienced photographer and graphic artist provide full-time support for this section.

Fellows are given a two-week experience in EM, preferably at the beginning of their training. This includes mainly bench training in all phases of EM processing so at the end of this experience, they are

able to use the EM independently for all cases they encounter during their subsequent training. Fellows obtain tissue samples for EM, select blocks for ultra-thin sectioning, examine specimens, and evaluate electron micrographs. Fellows also take a test focusing on theoretical principles and image recognition.

The EM archives contain a wealth of teaching cases indexed by diagnostic group and patient name. Fellows are encouraged to review and periodically update these files.

Staff Responsible for Supervision and Instruction
Atilano G. Lacson, M.D., FRCPC, Consolato Sergi, M.D., FRCPC, and Richard Vriend, M.T.

Supervision and Evaluation
As in surgical and autopsy cases, the faculty member assigned to each case is responsible for fellow supervision. As part of the EM rotation, fellows take a theoretical and practical multiple-choice exam developed in-house, based on numerous diagnostic electron micrographs. This test is given at the beginning of the EM rotation (pre-test) and at a later time (post-test) and serves as an indicator of progress. The performance of trainees is noted on the formal evaluation, which is done every six months.

Recommended Reading
Ghadially: Electron Microscopy of Tumors
Ghadially: Diagnostic Ultrastructural of Pathology
Dickersin: Diagnostic Electron Microscopy: A Text Atlas

Electives

Rotations are arranged in a flexible way to avoid duplication of areas in which the fellow may have had significant previous experience and to strengthen weak areas. The rotation schedule may also be adjusted depending on the fellows' progress. One month is devoted to research, primarily clinical in nature. Some of the electives are best suited for fellows staying in the program for a second year.

Neuropathology and Neuromuscular Pathology Elective

This elective requires prior approval from the Neuropathology Service.

Renal Pathology - Immunology Elective

This elective requires prior approval from the Renal Service.

Molecular Pathology Elective

This elective requires prior approval from the Molecular Pathology Service.

Hematopathology Elective

This elective requires prior approval from the Molecular Pathology Service.

Dermatopathology Elective

This elective requires prior approval from the Dermatopathology Service.

Microbiology Elective

This elective requires prior approval from the Microbiology Service.

Biochemistry and Special Biochemistry Elective

This elective requires prior approval from the Biochemistry and special Biochemistry Service.

Management and Performance Improvement

Performance and management issues are discussed weekly at the end of the Pathology Review Conference, which is attended by the fellow. The director of Anatomic Pathology conducts, on a quarterly basis, a formal review of performance improvement focusing on diagnostic accuracy, turnaround times and other parameters.

A recurring session with the Section Head of QA will be scheduled and every diagnostic discrepancy in pediatric pathology is analyzed. A weekly meeting (Monday, 11 a.m.) will focus on technical and administrative issues pertaining to Pediatric Pathology. The fellow will have a seat at the quality review committee meetings as appropriate. As a matter of policy and in compliance with legal protections, strict confidentiality will be observed.

Conferences and Other Educational Activities

1. Anatomical Pathology Review Conference. All interesting, instructive and problematic surgical cases are reviewed in a weekly working session attended by faculty, fellow and rotating resident (when possible) and medical students. Fellows have the opportunity to see every interesting case presented to the department and participate in the problem-solving process of a variety of pediatric pathology cases. Every pediatric and fetal autopsy is also reviewed by the entire staff at the same conference. Autopsy slides are shown as unknowns. An objective microscopic analysis is followed by presentation of the case history, discussion, and correlation of clinical and anatomical findings. Fellows present and discuss their cases. This meeting is the most important departmental meeting and teaching session. It is also a key component of performance improvement in anatomical pathology and gives the opportunity to evaluate fellow performance.

2. Oncology (Tumor Board) Conference. These meetings are held every Thursday at 4 p.m. Current tumor cases are presented. Each case opens with a presentation of the clinical findings. The radiological and pathological findings are then presented and discussion ensues focusing on management. Once a month, the conference is devoted to the reviews of interesting clinical or pathological topics. Attendance of this meeting by pathology fellows is mandatory. It provides fellows with a broad perspective of the problems of pediatric neoplasia. Fellows present cases they have worked up.

3. **LMP Grand Rounds.** These are held every Thursday at 12 noon. Every so often, Grand Rounds will include a hospital-wide Clinico-Pathologic Correlation conference in which interesting autopsy/surgical findings are presented. Fellows are required to attend these conferences. They are also invited to help in the preparation and presentation of the cases when appropriate.

4**. Pediatric GI Pathology Rounds.** This meeting occurs once a month when endoscopic biopsies are reviewed with the gastroenterologists and other learners using the multiple head microscope or video microscope. This gives the opportunity for clinical-pathological correlation. Fellows attend and present their cases.

6. Neonatal Intensive Care Unit (NICU) Mortality Review. All neonatal autopsies are reviewed during this quarterly meeting. The meeting is attended by staff neonatologists, staff pathologists and pathology fellows. Clinical presentation and discussion is followed by presentation of pathological findings and clinical-pathological correction. This is an important performance improvement meeting for the NICU. Pathology fellows are present and discuss the autopsies they have performed.

7. Pediatric Intensive Care Unit (PICU) Mortality Review. This conference is held every month and reviews all complicated cases with morbidities and cases that lead to death. The fellow will present the autopsy findings when appropriate.

8. Pediatric Neuro-Oncology Conference. This meeting is held every week in Pathology. The most interesting neuroimaging studies of the previous week are presented and discussed by radiology,

neurology and neurosurgery attendings. The Neuropathologists participate in this meeting and fellows in pathology, neurology, neurosurgery and rotators attend.

9. Pediatric Mortality and Morbidity Review: This is a monthly meeting at 7:30 AM on the first Tuesday of the month, where selected deaths are discussed and management issues raised, with input from pathology about cause of death.

9. Pediatric Grand Rounds. These are formal pediatric presentations provided to pediatric house staff and faculty on a weekly basis. Attendance at these lectures is highly encouraged mandatory as they provide pediatric pathology fellows with broad concepts of clinical pediatrics. Presentation at these rounds will be encouraged at least once in the training year.

10. Perinatal Mortality and Morbidity Meeting at the RAH. This meeting occurs once a month at noon on the fourth Tuesday of each month where perinatal deaths and management are reviewed and discussed with multidisciplinary participation including Perinatology, Obstetrics and Gynecology, NICU, Medical Genetics, and Pathology.

11. Medical School Teaching. Fellows may attend medical school pathology lectures and participate as laboratory instructors in pathology laboratories. M2 (sophomore year) Systemic Pathology curriculum evolves through the entire school year. The student laboratories for the UAH/Stollery campus are located in the Pathology Department. Participation of fellows in these laboratory sessions as instructors gives the fellow an opportunity to review basic knowledge, develop teaching skills, and influence future career options among medical students.

National Meetings:

Fellows may be given an allowance to be used for attending a North American conference such as the meeting of the Society for Pediatric Pathology when they are presenting their research work. They may also electively attend seminars given at UAH/Stollery, Royal Alexandra or other regional pediatric pathology programs.

1. Society for Pediatric Pathology, Spring and Fall Meetings

2. Canadian Association of Pathology Meetings (Summer)

3. USCAP meetings (Spring)

4. College of Anatomic Pathology Meetings (Fall)

5. Children's Oncology Group Fall meetings

Faculty

Program Director

Atilano G. Lacson, M.D., FRCPC
Head, Section of Pediatric Pathology
Clinical Professor of Pathology, Adjunct Clinical Associate Professor of Pediatrics, University of Alberta

Teaching Staff

- Consolato Sergi, M.D., PhD, FRCPC, Pediatric and Perinatal Pathologist, UAH
- Atilano Lacson, M.D., FRCPC, Director, Divisions of Anatomic and Pediatric Pathology
- Nenad A. Lilic, M.D., Perinatal and Pediatric Pathologist, Royal Alexandra Hospital
- Laurie Russell, M.D., FRCPC, Perinatal Pathologist, Royal Alexandra Hospital
- Suzanne Chan, M.D., FRCPC, FCCMG, Perinatal Pathologist, Royal Alexandra Hospital

Teaching Materials

A. Pediatric Pathology Teaching Sets: Approximately 500 histological sections arranged by organ system (Cardiorespiratory, GI, Hepatobiliary, Hematopoietic, Reproductive, Renal, Skeletal, Skin, Pediatric tumors, CNS, Muscle and nerve, Placenta, soft tissue tumors, and other).

B. Medical School Teaching Sets and Museum Specimens: These materials are used for teaching systemic pathology to medical students and are available to fellows. They include adult and pediatric material.

C. Society for Pediatric Pathology Slides: Interesting cases that have been acquired through the SPP Slide Survey Program and through attendance at national and international meetings.

D. Hematology Teaching Files

E. EM Teaching Files

F. Autopsy, Surgical, and Neuropath Slide and Kodachrome Collections.

G. Digital image files and Power Point presentations of autopsy, Embryofetal, EM and surgical cases, as well as a review course in Pediatric and Perinatal Pathology.

MEDICAL INFOMATICS

All specimens are accessioned into the CoPath Laboratory Information System. The LIS includes an online data base used to store and retrieve specific patient results. Specific data searches can be performed. In clinical pathology, a daily list of significant abnormal results is generated and reviewed by the supervisor and medical director for each section. Specific data searches can be performed. Online terminals are present in nursing stations, laboratories, staff offices, and fellow and student offices. Fellows are taught to use the system for data entry and retrieval. The clinical database is available on a regional basis and soon, on a provincial basis. Access to this information is granted to trainees in a limited fashion, which helps in assessing specimens in a clinical context.

The EM suite includes a full digital imaging station. In addition, the photographic station can acquire and process gross and light microscopic images and images obtained from scanning kodachromes, prints and radiology films. The computers in this station have Adobe Photoshop, Microsoft PowerPoint and other image processing software. The fellows use this station to prepare their presentations.

PARTICIPATION IN LOCAL, REGIONAL OR NATIONAL PATHOLOGY MEETINGS

UAH/Stollery Children's Hospital and Capital Health System hospitals have several large training programs, including a pathology program at the UAH/Stollery Hospital that is the major teaching centre for the University of Alberta Laboratory Medicine and Pathology Department. Pediatric pathology fellows attend conferences and seminars at UAH/Stollery Children's Hospital, Royal Alexandra Hospital

and other regional hospitals. Calgary, about 200 miles south of UAH/Stollery Children's Hospital, offers a variety of high-quality programs that are also available to fellows. Fellows are given a special allowance that can be used for attending one national meeting each year, preferably a meeting of the Society for Pediatric Pathology, or the Canadian Association of Pathology, where they can present their research.

Library Facilities - Text Books - Journals

- **UAH/Stollery Children's Hospital (JW Scott Health Sciences Library)**
  The **JW Scott Health Sciences Library** supports the informational and educational needs of UAH/Stollery Children's Hospital medical and nursing staffs, employees and students. The library is located in three floors within the Medical Sciences Building. Pediatrics and Pediatric Pathology resources are available as bound volumes of journals, books and audiotapes. Available online library journals are extensive.

  Staffed by reference and general librarians and, the library is open late all week. The library is affiliated with CAPITAL HEALTH and is a member of the National Network of Libraries of Medicine. It is also a member of OVID, a growing information network of databases such as MEDLINE, PUBMED, Internet services, electronic books and journals and library catalogues.

  Departmental Library/Meeting Rooms
  There are two library/meeting rooms in the Department of Pathology, one on the fifth floor and one on the fourth floor. The latter is used as a classroom/boardroom for the many Pathology Meetings that occur throughout the year.

  Standard Pediatric Pathology textbooks are located in the faculty staff offices as well as resident/fellow rooms. There are approximately 150 textbooks in the AP area. The Cytogenetics and Molecular Genetics Laboratories subscribe to journals that are also available to fellows.

Partial List of Available Books:

Gilbert-Barness: Potter's Pathology of the Fetus and Infant, 1st and 2nd edition.
Benirschke: Pathology of the Human Placenta
Coffin: Pediatric Soft Tissue Tumors
Cotran et al: Pathologic Basis of Disease
Dabbs: Diagnostic Immunohistochemistry
Stocker and Dehner: Pediatric Surgical Pathology
Unni: Dahlin's Bone Tumors
Dubowitz: Muscle disorders in Childhood
Elder: Lever's Histopathology of the Skin
Enzinger and Weiss: Soft Tissue Tumors
Fenoglio-Preiser: Gastrointestinal Pathology, Atlas and Text

Fletcher: Diagnostic Histopathology of Tumors
Friede: Developmental Neuropathology
Jones: Smith's Recognizable Patterns of Human Malformation
Keeling: Fetal and Neonatal Pathology
McKee: Skin Pathology
Ming et al: Pathology of the GI Tract
Parham: Pediatric Neoplasia
Poplack-Pizzo: Pediatric Oncology
Reed et al: Diseases of the Fetus and Newborn
Sternberg: Diagnostic Surgical Pathology
Stocker-Dehner: Pediatric Pathology
Weiss: Soft Tissue Tumors
Wigglesworth-Singer: Textbook of Fetal and Perinatal Pathology
Williams et al: Hematology
WHO classification of tumors of Hematopoietic and Lymphatic Tissues
WHO classification of tumors of Soft Tissue and Bone
WHO classification of tumors of the Nervous System.
WHO Pathology and Genetics: Structural and Molecular Basis of Skeletal Muscle Diseases

Research Activities

Fellows are required to do clinical research, usually as co-investigators of projects done by faculty in the course of the program. A project is formulated at or near the beginning of the fellowship, and a one to two month research rotation may be provided should the project be considered appropriate by both the program director and the project supervisor. Results are presented at DRIvE Days at UAH/Stollery Children's Hospital Laboratory and Pathology Department, and may be presented at meetings of the Society for Pediatric Pathology or other, appropriate scientific venues.

Publications:

Publications by future fellows will be listed here.

Space, Facilities & Equipment

The fellow's work station at both sites is equipped with a personal computer that is linked to the hospital information system and has Internet Explorer software. Fellows can perform Medline searches, access full text journals and textbooks, and access the hospital library CD ROMs from their offices. Access to the provincial medical electronic record (NetCare) and the LIS (Co-Path) is also provided. The Photography Lab is equipped with a digital image processing station that can be used to prepare electronic presentations and posters.

The Department of Pathology & Laboratory Medicine at UAH/Stollery Children's Hospital are situated on three floors and includes the following laboratories: Chemistry, Urinalysis, Hematology, Transfusion Medicine, Histocompatibility Laboratory, Special Chemistry, Environmental Toxicology, Microbiology, Virology, Immunology, Electron Microscopy, Histology, Cytology and Immunohistochemistry. There is ample storage space for 10 years' worth of slides and blocks and a large autopsy facility in the basement. The anatomic pathology professional and administrative staff offices are on the fifth floor. There are two libraries/meeting rooms, one on the fifth floor and one on the fourth.

The laboratory contains a significant amount of state-of-the-art equipment including a new electron microscope with digital image acquisition and processing, two Light Cycler PCR machines, three other thermal cyclers, a MagnaPure nucleic extraction station, two Cell Dyn hematology analyzers, two Hitachi chemistry analyzers, two radiometer blood gas analyzers, a BactAlert blood culture system, a GBC atomic absorber, a spectrophotometer, a DPC Immulite analyzer and others.

The laboratory information system is accessible in most work stations in each laboratory and is interfaced with the hospital information system. PCs are available in the staff offices and the fellow's workstation. This laboratory information system allows specimen tracking from accession to report, reporting and data retrieval.

The fellow's workstation is located on the fifth floor of the UAH and the fourth floor at the Royal Alexandra Hospital. There are two multi-head microscopes used for sign-out and review sessions located near the EM lab. Additionally, staff offices have a microscope each equipped with a teaching arm and digital camera. The two libraries are equipped with projection equipment, including an LCD projector and a laptop computer. Internet connectivity is available in the fourth floor conference room. There is also a video microscope with a high-resolution plasma screen available for teaching in lieu of a multihead microscope on the fifth floor meeting room.

Evaluation

Evaluation of the Program

The program director and faculty will have an open line of communication with the fellow. Informal feedback from fellows is sought from time to time and is part of every day interaction. The quality of educational experience, adequacy of educational materials, and other matters pertaining to the program are occasionally discussed at staff meetings with participation of the fellow, and adjustments are made as needed. At the end of the training and at other times as requested by the program director, fellows grade the quality of their experience on a number of points, including facilities, quality of staff, time devoted to them, etc. A special form is used for this purpose. The results of these evaluations are shared with the faculty of the program.

The program is evaluated formally by the University of Alberta Post-Graduate Medical Education Committee. We will be working toward making this a diploma program under the Royal College of Physicians and Surgeons, as well as being recognized by the American Board of Pathologists.

A measure of the effectiveness of any program is success of its trainees in Board Examination (if applicable) and in obtaining gainful employment. While Pediatric Pathology is not a popular choice as a subspecialty, many full time jobs in Pediatric Pathology have become available as many practicing pediatric pathologists have reached retirement age; additionally, many graduates of Pediatric Pathology training programs across North America have found gainful work practicing both pediatric and adult pathology. We will track the progress of each graduate of the program.

Fellow Evaluation

Staff pathologists and other faculty interact with fellows extensively and have the opportunity to observe them in action, at conferences and other settings. Informal discussions focusing on performance and suggestions for improvement are part of every day interaction between faculty and fellows. Formal evaluations are done twice a year with input from all staff, particularly directors of laboratories in which fellows have rotated. Fellows are graded on a variety of parameters included in the six core competencies scheme. We will use the current evaluation form adapted for pathology. The results of this evaluation are shared with the trainees at a meeting with the program director. The written evaluations are filed at the Post-graduate Medical Education Office.

Academic Discipline & Grievance Procedures

There will be times when it may be necessary to discipline or dismiss a fellow from the program. Reasons for such action include:

- Academic failure
- Ethics violations
- Disruptive behavior

In these situations, the program director may elect initially to counsel the fellow or provide academic remediation. In more severe cases, dismissal from the program may be considered.

All instances in which an adverse action on the fellow is taken should be documented and the fellow should be given notice and should have the opportunity to present his/her position.

If a grievance arises (a grievance is any dispute or controversy about the interpretation or application of the fellow contract, any rule or regulation, or any policy or practice), the following grievance procedure will be followed:

- The Fellow will first discuss his grievance with the Program Director.
- If no satisfactory resolution is achieved, the grievance will then be discussed with the Chairman of the Department of Pathology.
- If no satisfactory resolution is achieved, the Fellow will present his or her grievance in written form to the University of Alberta Director of Post-Graduate Medical Education.
- If no satisfactory resolution is achieved, the matter will be processed following procedures outlined in UAH/Stollery Children's Hospital's "House Officers Due Process" policy. This policy is included in the procedure manual fellows receive at the beginning of their training.

Strengths of the Program

A. By virtue of being located at a progressive University Hospital with growth in Pediatrics and Pediatric Specialties, and a large University Pathology department, the program receives the full attention of the Pediatric Pathology Section. Funding of the program from the Department of Pediatrics and Capital Health is secure.

B. This is a growing laboratory with state-of-the-art equipment and facilities that serves as a regional referral center for neuropathology, neuromuscular pathology, renal pathology, diagnostic EM, embryofetal and placental pathology, and microbiology.
C. Genetic pathology (embryofetal pathology, cytogenetics, molecular pathology) is an integral part of the program.

D. UAH/Stollery Children's Hospital is a vibrant institution with a modern physical plant, a large staff, a strong pediatric residency, and fellowships in pediatric emergency medicine, pediatric pulmonology, pediatric hematology/oncology and others. A strong affiliation with other programs and the University of Alberta and Capital Health Systems affiliation allow the fellows of these programs to interact positively with other pathology fellows and clinical fellows.

E. Edmonton and region is a vibrant community with a large emphasis on research programs (e.g., Cardiac Institute, Northern Alberta Heritage Research Foundation, among others. The city is one of the most livable Canadian cities offering much in the way of recreation, entertainment and cultural activities, which are community-centered.

Areas That Need Strengthening

A. While this is a new program, we are steadily optimistic in promoting and recruiting highly qualified candidates into this new program.

B. We will continue efforts to attract candidates by advertising and maintaining a high profile at the medical school and among regional programs.

C. In Canada, freestanding pediatric hospitals are uncommon; in these situations, pediatric pathologists may also be involved in the medical direction and administration of the clinical laboratories or practice within different specialties. Our program will strive to provide a high quality experience in pediatric anatomic pathology. Advanced studies in Pediatric Anatomic and Clinical pathology and further training in laboratory management can be available, should the fellow desire such experiential learning in a second year of training.

D. While our program can prepare the fellow for the American Pediatric Pathology Board Examinations, the only certifying body in North America, the training is not yet recognized by that Board, which currently requires that trainees graduate from an American Council of Graduate Medical Education (ACGME) accredited program, currently offering accreditation only in the United States.

E. The Royal College of Physicians and Surgeons has not yet officially recognized the subspecialty of Pediatric Pathology, although many of the pediatric centres in Canada employ American board certified pediatric pathologists. A diploma certificate has been offered to “orphaned” programs currently not certified by the Royal College of Physicians and Surgeons of Canada.