

PEDIATRIC PATHOLOGY

GOALS AND OBJECTIVES

General Educational Fellowship Objectives and Goals

The Pediatric Pathology Fellowship provides subspecialty training in Pediatric Pathology in preparation for certification and sub-specialty qualification in Pediatric Pathology by the American Board of Pathology, and in preparation for a successful transition to the unsupervised practice of Pediatric Pathology. This fellowship program offers a structured and organized educational experience in diagnostic pediatric pathology, including surgical, hematologic, placental, embryo-fetal and autopsy pathology.

The Pediatric Pathology Fellowship consists of rotations in Forensic Pathology (2 weeks for non-Vanderbilt trained candidates), Neuropathology (1 month), Hematopathology (1 month), and an experience in Cytopathology and Genetics (1 month). The remainder of the program consists of Pediatric Surgical and GI Biopsy Pathology, which rotates on a weekly basis. Pediatric, perinatal, and fetal autopsies are performed at Vanderbilt as they arise throughout the year and the Fellow is expected to participate in a minimum of 5 forensic autopsies at the Davidson County Medical Examiners' Office.

Fellows have extensive clinical responsibilities on each rotation and always have faculty available, providing at a minimum Indirect Supervision with Direct Supervision Available on any rotation.

Because of the importance of the pathologic information they provide, fellows must exercise sound judgment, appropriate caution, and judicious use of consultations with faculty to ensure a high standard of patient care. Training in effective communication with patients and clinicians is emphasized as well as training in laboratory management including QA/QC/QI training, with the ultimate goal of optimizing patient care.

Through the course of the pediatric pathology Fellowship, the Fellow must complete the following:

- Perform at least **2000** gross and/or histologic examinations of **2000** pediatric surgical pathology specimens
- Complete or perform 40 pediatric/perinatal autopsies/fetopsies, cases must be entered into the ACGME Case Log System
- Demonstrate competence in interpreting the results of laboratory assays used in pediatric pathology, to include immunopathologic and histochemical assays and molecular techniques including diagnostic assays for metabolic diseases
- Demonstrate competence in general and systemic aspects of autopsy and surgical pathology, to include embryo-fetal, perinatal and placental pathology
- Demonstrate competence in pediatric cytopathology, ultrastructural pathology, and cytogenetics
- Demonstrate competence in pediatric aspects of dermatopathology, gynecological and obstetrical pathology, forensic pathology and neuropathology
- Be able to systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement
- Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems

- Perform at least 50 intraoperative consultations during the program to include providing medical advice on the diagnosis and medical management of the disorder when appropriate
- Competently educate others in applicable aspects of pediatric pathology
- Demonstrate a commitment to carrying out professional responsibilities and adherence to ethical standards and principles
- Demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal healthcare
- Participate in evidence based scholarly activity to include at least one of the following:
 1. Evidence based presentations at a journal club or meeting
 2. Preparation and submission of articles for peer-reviewed publications
 3. Research

General Educational Goals and Objectives

Patient care

- To become competent in the work-up and diagnosis of pediatric pathology specimens in order to practice independently in an academic or community hospital.
- To develop proficiency in diagnostic pediatric pathology.
- To develop proficiency in the description and handling of pediatric gross pediatric pathology specimens.
- To understand indications and use for commonly encountered fixatives and tissue preservatives.
- To understand ways in which diagnoses are applied to therapeutic decision-making by the clinical staff.
 - To develop proficiency in performance and interpretation of frozen section diagnoses.
 - To learn appropriate application of ancillary techniques such as immunohistochemistry, genetics, molecular testing, and electron microscopy to pediatric pathology specimens.
- To develop proficiency in recognition, description, and reporting of lesions encountered in pediatric pathology practice.
- To serve as a first-line consultant regarding pediatric pathology diagnoses for the clinical staff.
- To ensure that the hand-over of cases occurs correctly, consistently and without errors.

Medical knowledge

- To refine conceptual understanding of pediatric disease and correlation with morphology.
- To achieve competency in recognizing commonly observed lesions in pediatric pathology.
- To refine an investigatory and analytic cognitive approach to pediatric pathology diagnoses.
- To understand the role of intraoperative consultations in clinical decision making.
- To understand the correlation of morphology with genetic and molecular alterations in pediatric tumors.
- To understand the scientific basis and practical applications of ancillary techniques such as immunohistochemistry, genetics, and molecular studies to pediatric diseases.
- To correlate surgical pathology findings with clinical presentation, radiology, and pathologic-prognostic indicators.

- To understand and apply the systems in current usage for classifying and reporting pediatric pathology malignant neoplasia.

Interpersonal and communication skills

- To develop proficiency in presentation of pediatric surgical pathology findings to pathologists, medical students, residents and clinicians.
- To use effective writing skills and appropriate terminology to generate the pediatric pathology report.
- To teach medical students who are assigned pediatric pathology cases or taking the pediatric pathology elective course. In this role, the Pediatric Pathology Fellow develops the ability to explain the gross specimen and microscopic findings, clarify clinicopathologic issues, and direct students to appropriate faculty with specific expertise.
 - To teach pathology residents on pediatric pathology rotations with an emphasis on frozen section analysis, gross specimen examination, and microscopic interpretation.
 - To learn to communicate effectively with surgeons about intraoperative consultations and pathologic diagnoses.
- To prepare accurate, effective, concise written reports.
- To ensure that the hand-over of cases occurs correctly, consistently and without errors.

Professionalism

- To demonstrate respect, compassion, and integrity in encounters with patients, clinicians, other residents, and staff in the setting of pediatric pathology.
- To complete written reports in a timely fashion.
- To work effectively as a team with technical and administrative staff, and treat technical and administrative staff with respect.
- To participate effectively in pediatric pathology teaching conferences.
 - To participate effectively in multidisciplinary conferences that include pediatric pathology participation.
 - To work effectively as a team with clinicians, pathology assistants, pathology technologists and other technical staff, and treat clinical, technical and administrative staff with respect.
 - To know the limits of scope of authority and limitations of knowledge, requesting assistance before these are breached.

Systems-based practice

- To develop an understanding of the role of quality assurance in diagnostic pediatric pathology by participating in quality assurance data collection, documentation, and reviews.
- To select appropriate, effective special studies for pediatric pathology cases.
 - To understand safety in pediatric pathology and the role of OSHA in setting work place safety standards.
 - To understand the use of laboratory informatics systems in pediatric pathology, for ordering, reporting, quality assurance, and billing purposes.
 - To apply current tumor staging and grading systems, and understand the role of these in data collection for tumor registries and national cancer databases.

Practice-based learning

- To use case-based learning as a tool for additional insight into disease pathogenesis.
- To locate, appraise, and assimilate pertinent evidence from scientific studies.
- To gain an understanding of newer technologies available for pediatric pathology diagnoses.
- To demonstrate effective problem solving skills in pediatric pathology, using a wide variety of information resources.

Pediatric Pathology

GI Biopsy Rotation

Rotation Director: Hernan Correa, M.D.

During the Pediatric Pathology Biopsy Rotation, the fellow covers all gastrointestinal biopsies received. The fellow is expected to dictate draft reports before sign-out with the attending assigned to the rotation. The fellow hours of service are 8:00 a.m. (slides are generally available around 8 a.m.) to 6:00 p.m. on the biopsy rotation. During weeks on GI biopsies the Fellow remains responsible for fetopsies and autopsies as they arise, and may be participating in frozen sections if his/her schedule permits.

The following instructions pertain to daily sign-out during the Biopsy Rotation:

1. Gather histories on all cases prior to sign-out.
2. Triage the cases according to importance or expected pathology based on the history. (Hirschsprung cases should be examined first in order to assess the need for additional sections and stains followed by cases in which the clinician has designated increased urgency)
 3. Preview the cases when slides are delivered from histology, usually between 8 to 8:30 am on weekday mornings. Prepare the cases so they are ready with draft reports for sign-out with the attendings.
4. Obtain previous pertinent material (slides and reports) when indicated. The slides from the previous 7 years are filed in the Children's Hospital at Vanderbilt (VCH) sign-out room. Older cases are stored at a remote warehouse and require additional time to be retrieved.
 5. Order the appropriate immunohistochemical studies and special stains. The immunohistochemical stained slides are delivered to the VCH sign-out room by 3-4 p.m. if ordered before 10 a.m.; if ordered after the cut-off time they are delivered the next morning.
6. Diagnoses should be structured and worded according to existing templates and must conform to vocabulary used at Vanderbilt.
7. The Pediatric Pathology Fellow is responsible for assisting with resident education including guidance on grossing of specimens, interpreting microscopic findings, and ordering ancillary diagnostic tests.
8. The Pediatric Pathology Fellow is responsible for reviewing biopsy slides with the clinical and/or surgical team.

Pediatric Pathology

GI Biopsy Rotation

Specific Goals and Objectives

Patient Care

- To develop proficiency in interpretation of diagnostic GI biopsies in pediatric population.
- To learn appropriate application of ancillary diagnostic techniques such as special stains, immunohistochemistry, cytogenetics, molecular diagnostics, and electron microscopy, for biopsy material.

Medical Knowledge

- To refine conceptual understanding of pediatric diseases and correlations with morphology.
- To refine an investigatory and analytic cognitive approach to the diagnosis of pediatric pathology biopsies.
- To understand the scientific basis and practical applications of immunohistochemistry.
- To correlate pediatric pathology findings with clinical presentation and pathologic-prognostic indicators.

Interpersonal and Communication Skills

- To develop proficiency in presentation of pediatric pathology biopsy findings to pathologists, residents, and clinicians.
- To prepare accurate, effective, concise written reports.

Professionalism

- To demonstrate respect, compassion, and integrity in encounters with patients, clinicians, other fellows, residents, and staff in the practice of pediatric pathology.
- To complete written reports in a timely fashion.
- To work effectively as a team with technical and administrative staff, and to treat technical and administrative staff with respect.
- To participate effectively in pediatric pathology teaching conferences.
- To participate effectively in multidisciplinary conferences that include pediatric pathology participation.

Systems-Based Practice

- To develop an understanding of the role of quality assurance in diagnostic pediatric pathology by participating in quality assurance data collection, documentation, and reviews.
- To select appropriate, effective special studies for pediatric pathology cases.
- To understand safety in pediatric pathology and the role of OSHA in setting workplace safety standards
- To understand the use of laboratory informatics systems in pediatric pathology, for ordering, reporting, quality assurance, and billing purposes.

Practice-Based Learning

- To use case-based learning as a tool for additional insights into disease pathogenesis.
- To locate, appraise, and assimilate pertinent evidence from scientific studies.
- To demonstrate effective problem-solving skills in pediatric pathology, using a wide variety of information resources.

Pediatric Pathology

Routines Rotation

Rotation Director: Jiancong Liang, MD PhD

During the Pediatric Pathology Routines Rotation, the fellow covers all surgical biopsies, excisions and resections. The fellow is responsible for handling and providing initial interpretation of all frozen sections with attending confirmation of the diagnosis prior to communication with the surgeon. The volume of the surgical specimens and frozen sections permits ample time for covering these activities. After the processing of the frozen sections, the Fellow also coordinates the sampling and, if applicable, collection of tissue for ancillary studies, Children's Oncology Group protocol studies, and research studies, followed by coordination of tissue fixation and sampling for diagnostic studies.

The fellow is expected to complete the draft reports before signing out with the assigned attending. The fellow hours of service are 8 a.m. (slides are generally delivered to sign-out area by 8 a.m.) to 6:00 p.m. on the Routines rotation.

The fellow's main responsibilities during the Routines Rotation are as follows:

1. Gather histories.
2. Triage the cases according to importance or expected pathology based on the history.
3. Begin to review the cases when slides are delivered from histology, usually between 7 and 8 a.m. on weekday mornings. Dictate the cases so they are ready with draft reports for sign-out with the attending.
4. Obtain previous pertinent material when indicated. The slides from the previous 7 years are filed in the Children's Hospital at Vanderbilt (VCH) sign-out room. Older cases are stored at a remote warehouse and require additional time to be retrieved.
5. Appropriate triaging of cases should allow appropriate stains to be ordered prior to the 10:00 a.m. (for immunohistochemistry) and 12:00 PM (for special stains) cut-off times. The slides for immunohistochemical stains are delivered to the VCH sign-out room by 4 p.m. if ordered before 10 a.m.; if ordered after the cut-off time they are delivered the next morning. The slides for special steins are delivered to the VCH sign-out room by 4 p.m. if ordered before 12 p.m.; if ordered after the cut-off time they are delivered by 4 p.m. the following day.
6. During an active intraoperative consultation, the fellow identifies the samples for frozen section, ensures that the specimen is optimally oriented and properly handled, and ascertains that the necessary information for handling of the frozen sections has been received from the operating room. The fellow is expected to call the operating room to confirm information if there is uncertainty regarding the specimen or the reason why the case is being submitted for frozen section.
7. During the initial months of the fellowship training, the fellow reviews the frozen section slides with the attending, and the faculty communicates the frozen section diagnosis to the surgeon in the operating room. As the fellow gains more experience and graded responsibilities, the fellow is expected to make a diagnosis, confirm the diagnosis with the attending, and communicate it to the surgeon in the operating room. If the attending assigned to the Routines service is not immediately available, their designated faculty should provide supervision as needed.
8. The fellow records the frozen section turn-around time on all cases after the diagnosis is called to the surgeon. This includes the time the specimen is received in the Pediatric

- Pathology Laboratory (“Time In”) and the time that the results are reported to the operating room (“Time Out”).
9. Neuropathology frozen sections are handled by the attending Neuropathology Faculty. The Pediatric Pathology Fellow is present during the review of the frozen section slides when possible.
 10. In cases of suspected leukemia/ lymphoma or other hematopathologic conditions, the fellow calls the hematopathology in-house resident or fellow after reviewing the frozen section material or touch preparations, and coordinates the work-up of the case.
 11. The fellow performs monthly correlation checks between frozen section diagnoses and final diagnoses. This duty is carried out with the assistance of pathology support staff and under the supervision by the designated faculty member (Dr. Huiying Wang).
 12. Diagnoses should be structured according to current standards and must conform to vocabulary used at Vanderbilt. Synoptic reporting should be used when applicable.
 13. The fellow is responsible for assisting with resident education including guidance on grossing of specimens, interpreting microscopic findings, and ordering ancillary diagnostic tests.
 14. The fellow is expected to review slides with the clinical and/or surgical teams upon their request.

Pediatric Pathology

Routines Rotation

Specific Goals and Objectives

Patient Care

- To develop proficiency in interpretation and diagnoses of pediatric pathology surgical specimens.
- To develop proficiency in interpretation and communication of frozen section diagnoses.
- To learn appropriate application of ancillary diagnostic techniques such as special stains, immunohistochemistry, cytogenetics, molecular diagnostics, and electron microscopy, for pediatric pathology material.

Medical Knowledge

- To refine conceptual understanding of pediatric diseases and correlations with morphology.
- To refine an investigatory and analytic cognitive approach to the diagnosis of pediatric pathology cases.
- To understand the scientific basis and practical applications of immunohistochemistry.
- To correlate pediatric pathology findings with clinical presentation, therapies and prognosis.
- To understand the role of intraoperative consultations in clinical decision-making.

Interpersonal and Communication Skills

- To develop proficiency in presentation of pediatric pathology findings to pathologists, residents, and clinicians.
- To further improve communication skills with surgeons about intraoperative consultations and pathologic diagnoses.
- To prepare accurate, effective, concise written reports.
- To teach pathology residents on surgical pathology rotations with an emphasis on frozen section analysis, gross specimen examination, and microscopic interpretation.

Professionalism

- To demonstrate respect, compassion, and integrity in encounters with patients, clinicians, other fellows, residents, and staff in the practice of pediatric pathology.
- To complete written reports in a timely fashion.
- To work effectively as a team with technical and administrative staff, and to treat technical and administrative staff with respect.
- To participate effectively in pediatric pathology teaching conferences.
- To participate effectively in multidisciplinary conferences that include pediatric pathology participation.

Systems-Based Practice

- To develop an understanding of the role of quality assurance in diagnostic pediatric pathology by participating in quality assurance data collection, documentation, and reviews.
- To select appropriate, effective special studies for pediatric pathology cases.
- To understand safety in pediatric pathology and the role of OSHA in setting work place safety standards.
- To understand the use of laboratory informatics systems in pediatric pathology, for ordering, reporting, quality assurance, and billing purposes.
- To apply current tumor grading systems, and understand the role of these in data collection for tumor registries and national cancer databases.

Practice-Based Learning

- To use case-based learning as a tool for additional insights into disease pathogenesis.
- To locate, appraise, and assimilate pertinent evidence from scientific studies.
- To demonstrate effective problem solving skills in pediatric pathology, using a wide variety of information resources.

Pediatric Pathology

Perinatal and Materno-Fetal Experience

Rotation Director: Hernán Correa, M.D.

The perinatal and materno-fetal experience is ongoing throughout the year. When placentas from multiple gestation, fetal demise cases, or ectopic pregnancies are received at VCH during the “routine rotation,” the fellow is responsible for coordinating the gross examination, dissection, and sampling. The fellow, with the assistance of the Pediatric Pathology Faculty, performs the gross evaluation, dissection and sampling of fetuses. The fellow performs the microscopic evaluation and dictates draft reports before sign-out with the corresponding attending. The fellow hours of service are 7:30 a.m. or 8:00 a.m. to 6:00 p.m. as per other rotations.

The following instructions pertain to daily sign-out of placentas, products of conception, and fetuses:

1. Gather histories.
2. Triage the cases according to importance or expected pathology based on the history.
3. Begin to review the cases when slides are delivered from histology. Dictate the cases so they are ready with draft reports for sign-out with the attending.
4. Obtain previous pertinent material when indicated. The slides from the previous 7 years are filed in the Children’s Hospital at Vanderbilt (VCH) sign-out room. Older cases are stored at a remote warehouse and require additional time to be retrieved.
5. Preview all cases prior to the 10:00 a.m. immunohistochemical stain cut-off time, and order the appropriate immunohistochemical studies and special stains. The immunohistochemical stained slides are delivered to the VCH sign-out room by 4 p.m. if ordered before 10 a.m.; if ordered after the cut-off time but prior to 4 PM they are delivered the next morning.
6. Diagnoses should be structured and worded according to existing templates and must conform to vocabulary used at Vanderbilt. For example, placenta specimens have existing templates.
7. Be actively involved in and coordinate with the PA staff the gross examination, dissection and sampling of the placentas, fetuses and products of conception.
8. The Pediatric Pathology Fellow is responsible for assisting with resident education including guidance on grossing placentas and fetuses less than 20 weeks gestation, interpreting microscopic findings, and ordering ancillary diagnostic tests.

Pediatric Pathology

Perinatal and Materno-Fetal Experience

Specific Goals and Objectives

Patient Care

- To develop proficiency in interpretation of normal and pathologic changes in placentas at different gestational ages.
- To develop proficiency in interpretation of normal and pathologic changes in the fetus at different gestational ages.
- To develop proficiency in interpretation of normal and pathologic changes in products of conception.
- To develop proficiency in interpretation of gestational trophoblastic diseases.

- To learn appropriate application of ancillary diagnostic techniques such as special stains, immunohistochemistry, cytogenetics, molecular diagnostics, and electron microscopy, for perinatal and materno-fetal specimens.

Medical Knowledge

- To refine conceptual understanding of placental pathology at different gestational ages.
- To develop conceptual understanding of fetal pathologies and correlations with morphology.
- To refine an investigatory and analytic cognitive approach to the diagnosis of placental and fetal pathologies.
- To understand the scientific basis and practical applications of immunohistochemistry and genetic studies as they pertain to placental and fetal specimens.
- To correlate placental and fetal pathologic findings with maternal clinical presentation and pathologic-prognostic indicators.

Interpersonal and Communication Skills

- To develop proficiency in presentation of the findings in placental, fetal, and products of conception specimens to pathologists, residents, and clinicians.
- To prepare accurate, effective, concise written reports.

Professionalism

- To demonstrate respect, compassion, and integrity in encounters with patients, clinicians, other fellows, residents, and staff in the practice of materno-fetal pathology.
- To complete written reports in a timely fashion.
- To work effectively as a team with technical and administrative staff, and to treat technical and administrative staff with respect.
- To participate effectively in pediatric pathology teaching conferences.
- To participate effectively in multidisciplinary conferences that include presentation of placental and fetal pathologies.

Systems-Based Practice

- To develop an understanding of the role of quality assurance in diagnostic materno-fetal pathology by participating in quality assurance data collection, documentation, and reviews.
- To select appropriate, effective special studies for placental and fetal pathology cases.
- To understand safety during handling of placental and fetal specimens and the role of OSHA in setting work place safety standards.
- To understand the use of laboratory informatics systems in materno-fetal pathology, for ordering, reporting, quality assurance, and billing purposes.

Practice-Based Learning

- To use case-based learning as a tool for additional insights into disease pathogenesis.
- To locate, appraise, and assimilate pertinent evidence from scientific studies.
- To demonstrate effective problem solving skills in materno-fetal pathology, using a wide variety of information resources.

Pediatric Pathology

Pediatric Autopsy Experience

Rotation Director: Hernan Correa, M.D.

During the Pediatric Pathology Fellowship, the fellow is responsible for performing or overseeing at least 40 pediatric and fetal autopsies. Since the opportunities for post-mortem examinations occur in a random manner, the Fellow is scheduled for pediatric autopsies continuously throughout the year. While the Fellow is occupied with the autopsy service, the assigned faculty carries the service work, and subsequently reviews interesting cases with the Fellow. Pediatric and fetal autopsies at VUMC collectively number between 40 and 50 per year. The Pediatric Pathology Fellow works alongside of the pathology resident assigned to each case, and participates in teaching the residents. The Fellow assists the pathology residents with the gross dissection, microscopic evaluation and report formulation. The level of responsibility for the dissection, sample selection and sign out of the autopsy material is graded as deemed appropriate by the Pediatric Pathology faculty and the Autopsy Rotation Director. The Pediatric Pathology Fellow is directly supervised by the attending faculty assigned to each case.

Pediatric Pathology

Pediatric Autopsy Experience

Specific Goals and Objectives

Patient care

- To refine competence in the work-up and diagnosis of pediatric autopsies in order to practice independently in an academic or community hospital.
- To develop greater proficiency in the description and handling of pediatric gross autopsy specimens.
- To develop proficiency in evaluation and diagnosis in pediatric autopsies.
- To develop greater proficiency in evaluation of malformative, genetic, and traumatic lesions, and lesions associated with inborn errors of metabolism.
- To understand indications, implementation, and use for additional tissue collection in cases of possible inborn errors of metabolism cases, possible syndromic cases, and forensic cases.
- To learn appropriate application of ancillary techniques such as immunohistochemistry, biochemical testing, genetics, molecular testing, and electron microscopy as they pertain to surgical pathology specimens.
- To develop proficiency in recognition, description, and reporting of lesions encountered.
- To understand ways in which autopsy diagnoses are applied by the clinical staff in their routine clinical practice.
- To serve as a first-line consultant regarding pediatric autopsy diagnoses for the clinical staff.
- To develop proficiency in the assessment and investigation of possible child abuse.
- To refine competence in the distinction between traumatic and non-traumatic injuries in children.

Medical knowledge

- To refine conceptual understanding of pediatric disease and correlation with postmortem gross morphologic and microscopic findings.
- To achieve competency in recognizing commonly observed lesions in pediatric autopsies.

- To achieve competence in the distinction between accidental and non-accidental trauma in children.
- To refine an investigatory and analytic cognitive approach to pediatric autopsy diagnoses.
- To understand the correlation of morphology with genetic and molecular alterations in pediatric disorders.
- To refine conceptual understanding in the evaluation of malformative, genetic, and traumatic lesions, and lesions associated with inborn errors of metabolism.
- To understand the scientific basis and practical applications of ancillary techniques such as immunohistochemistry, biochemical genetics, and molecular studies during pediatric autopsy post-mortem examinations.
- To achieve competence in the assessment and investigation of possible child abuse.
 - To achieve competence in the assessment and investigation of sudden death in children and in Sudden Infant Death Syndrome.
 - To achieve competence in the recognition of accidental and non-accidental lesions that may be mistaken with Sudden Infant Death Syndrome.
 - To achieve competence in evaluation of death scene following the sudden death of a child.

Interpersonal and communication skills

- To develop proficiency in presentation of pediatric autopsy findings to pathologists, medical students, residents, and clinicians, and the members of the child's family.
- To use effective writing skills and appropriate terminology to generate the pediatric autopsy report.
- To teach pathology residents on the autopsy rotation; with an emphasis on post-mortem gross and microscopic evaluation and interpretation.
 - To learn to communicate effectively with clinicians and surgeons about the preliminary and final findings at the autopsy.
- To prepare accurate, effective and concise written reports.

Professionalism

- To demonstrate respect, compassion, and integrity in encounters with patients, patient's families, clinicians, other residents, and staff in the setting of pediatric autopsy.
- To complete written reports in a timely fashion.
- To participate effectively in autopsy pathology teaching conferences.
 - To participate effectively in multidisciplinary conferences that include autopsy pathology presentations.
 - To work effectively as a team with clinicians, pathology assistants, pathology technologists and other technical staff, and treat clinical, technical and administrative staff with respect.
 - To know the limits of scope of authority and limitations of knowledge, requesting assistance before these are breached.

Systems-based practice

- To develop an understanding of the role of quality assurance in post-mortem pediatric pathology by participating in quality assurance data collection, documentation, and reviews.

- To select appropriate, effective special studies for pediatric autopsy cases.
- To understand safety in pediatric pathology and the role of OSHA in setting work place safety standards.
- To understand the use of laboratory informatics systems in pediatric pathology, for ordering, reporting, quality assurance, and billing purposes.

Practice-based learning

- To use case-based learning as a tool for additional insight into disease pathogenesis.
- To locate, appraise, and assimilate pertinent evidence from scientific studies.
- To gain an understanding of newer technologies available for pediatric autopsy diagnoses.
- To demonstrate effective problem solving skills during the performance of pediatric autopsies, using a wide variety of information resources.

During the Pediatric Autopsy Rotation, the Fellow develops knowledge and skills unique to pediatric autopsies including abstraction of the medical record to formulate a concise and relevant clinical summary with statement of questions to be answered at autopsy. The Fellow refines detailed dissection techniques of the body and CNS, including dissection and identification of malformative lesions, post-surgical and post-therapy changes, and evaluation of autolysed cases, and formulation of clinically relevant provisional diagnosis, as well as accurate, meaningful, complete, clear, concise and well integrated final written reports.

Pediatric Pathology

Medical Examiner Rotation/Experience

Rotation Director: David Zimmerman, MD

The Office of the Medical Examiner performs autopsies for over 55 counties in Middle Tennessee. Cases come from both urban and rural settings, averaging over 175 pediatric cases each year. The office has 9 board certified Forensic Pathologists. The office is accredited by the National Association of Medical Examiners.

For Pediatric Pathology Fellows who have not trained at Vanderbilt Medical Center there will be a 1-week rotation at the Office of the Medical Examiner to familiarize themselves with the policies and procedures at the office. Fellows who have done their training at Vanderbilt will not be required to do this rotation. After the initial rotation at the Office of the Medical Examiner, the Fellow will be on call to the Medical Examiner with a goal of participating in at least 5 pediatric cases. The Fellow will be present during the postmortem examination, the evaluation of microscopic material, and discussion of these cases. All cases will be performed alongside attending forensic pathologists.

During the forensic pathology experience the Pediatric Pathology Fellow should become familiar with the gross and microscopic appearance of pediatric lesions that are commonly encountered by medical examiners. An emphasis will be placed on the following:

1. Assessment, investigation, and postmortem evaluation of suspected child abuse
2. Evaluation of accidental and non-accidental injuries
3. Sudden unexpected infant deaths and co-sleeping deaths
4. Identify and understand traumatic lesions and medical abnormalities that mimic trauma
5. Determining the time of injury and/or death
6. Knowledge of proper methods for handling medico-legal evidence

Pediatric Pathology

Pediatric Autopsy Rotation/Experience

Specific Goals and Objectives

Patient care

- To refine competence in the work-up and diagnosis of pediatric autopsies in order to practice independently in an academic or community hospital.
- To develop greater proficiency in the description and handling of pediatric gross autopsy specimens.
- To develop proficiency in evaluation and diagnosis in pediatric autopsies.
- To develop greater proficiency in evaluation of malformative, genetic, and traumatic lesions, and lesions associated with inborn errors of metabolism.
- To understand indications, implementation, and use for additional tissue collection in cases of possible inborn errors of metabolism cases, possible syndromic cases, and forensic cases.
- To learn appropriate application of ancillary techniques such as immunohistochemistry, biochemical testing, genetics, molecular testing, and electron microscopy as applied to autopsies.

- To develop proficiency in recognition, description, and reporting of lesions encountered.
- To understand ways in which autopsy diagnoses are applied by the clinical staff in their routine clinical practice.
- To serve as a first-line consultant regarding pediatric autopsy diagnoses for the clinical staff.
- To develop proficiency in the assessment and investigation of possible child abuse.
- To refine competence in the distinction between traumatic and non-traumatic injuries in children.

Medical knowledge

- To refine conceptual understanding of pediatric disease and correlation with postmortem gross morphologic and microscopic findings.
- To achieve competency in recognizing commonly observed lesions in pediatric autopsies.
- To achieve competence in the distinction between accidental and non-accidental trauma in children.
- To refine an investigatory and analytic cognitive approach to pediatric autopsy diagnoses.
- To understand the correlation of morphology with genetic and molecular alterations in pediatric disorders.
- To refine conceptual understanding in the evaluation of malformative, genetic, and traumatic lesions, and lesions associated with inborn errors of metabolism.
- To understand the scientific basis and practical applications of ancillary techniques such as immunohistochemistry, biochemical genetics, and molecular studies during pediatric autopsy post-mortem examinations.
- To achieve competence in the assessment and investigation of possible child abuse.
 - To achieve competence in the assessment and investigation of sudden death in children and in Sudden Infant Death Syndrome.
 - To achieve competence in the recognition of accidental and non-accidental lesions that may be mistaken with Sudden Infant Death Syndrome.
 - To achieve competence in evaluation of the death scene following the sudden death of a child.

Interpersonal and communication skills

- To develop proficiency in presentation of pediatric autopsy findings to pathologists, medical students, residents and clinicians, and members of the child's family.
- To use effective writing skills and appropriate terminology to generate the pediatric autopsy report.
- To teach pathology residents on the autopsy rotation; with an emphasis on post-mortem gross and microscopic evaluation and interpretation.
 - To learn to communicate effectively with clinicians and surgeons about the preliminary and final findings at autopsy.
- To prepare accurate, effective and concise written reports.

Professionalism

- To demonstrate respect, compassion, and integrity in encounters with patients, patient's families, clinicians, other residents, and staff in the setting of pediatric autopsy.
- To complete written reports in a timely fashion.
- To participate effectively in autopsy pathology teaching conferences.
 - To participate effectively in multidisciplinary conferences that include autopsy pathology presentations.

- To work effectively as a team with clinicians, pathology assistants, pathology technologists and other technical staff, and treat clinical, technical and administrative staff with respect.
- To know the limits of scope of authority and limitations of knowledge, requesting assistance before these are breached.

Systems-based practice

- To develop an understanding of the role of quality assurance in post-mortem pediatric pathology by participating in quality assurance data collection, documentation, and reviews.
- To select appropriate, effective special studies for pediatric autopsy cases.
- To understand safety in pediatric pathology and the role of OSHA in setting work place safety standards.
- To understand the use of laboratory informatics systems in pediatric pathology, for ordering, reporting, quality assurance, and billing purposes.

Practice-based learning

- To use case-based learning as a tool for additional insight into disease pathogenesis.
- To locate, appraise, and assimilate pertinent evidence from scientific studies.
- To gain an understanding of newer technologies available for pediatric autopsy diagnoses.
- To demonstrate effective problem solving skills during the performance of pediatric autopsies, using a wide variety of information resources.

At the Medical Examiner's Office, the Fellow gains experience in the evaluation, autopsy examination, and medical-legal interpretation of autopsy material in the setting of unexpected and/or traumatic infant and pediatric deaths including instances of suspected SIDS, child abuse/neglect and accidental or criminal injury.

Pediatric Pathology

Cytopathology Rotation:

Rotation Director: Huiying Wang, M.D.

A portion of one month will be allotted to a formal cytology rotation. During the cytology month the Fellow should make use of the available, applicable cytology study sets and active cases; participate in FNAs for pediatric patient and join tumor board/conferences. Additionally, throughout the year (in pediatric pathology) as fresh specimens are received, touch preparations will be made as part of triage of specimens when indicated and reviewed. During the Pediatric Pathology Fellow's Unknown Conference, the Fellow will be expected to present at least 2-3 cases in which touch preparations were helpful in making the diagnosis or triaging the specimen and the accompanying frozen section and/or permanent sections should also be incorporated into the presentation. It is encouraged for the fellow to collect cases for the pediatric-cytology study set. The Fellows hours of service are from 8 a.m. to 6 p.m.

Pediatric Pathology

Cytopathology Rotation:

Specific Goals and Objectives

Patient Care

- To develop proficiency in diagnostic pediatric cytopathology.
- To learn appropriate application of ancillary diagnostic techniques such as immunohistochemistry, cytogenetics, molecular diagnostics, and electron microscopy, for cytopathology specimens.

Medical Knowledge

- To refine conceptual understanding of diseases and correlations with morphology.
- To refine an investigatory and analytic cognitive approach cytopathology diagnoses.
- To understand the scientific basis and practical applications of immunohistochemistry.
- To correlate cytopathology findings with clinical presentation and pathologic-prognostic indicators.

Interpersonal and Communication Skills

- To develop proficiency in presentation of pediatric cytopathology findings to pathologists, residents, and clinicians.
- To teach pathology residents on cytopathology rotations microscopic interpretation.
- To prepare accurate, effective, concise written reports.

Professionalism

- To demonstrate respect, compassion, and integrity in encounters with patients, clinicians, other fellows, residents, and staff in the practice of pathology.
- To complete written reports in a timely fashion.
- To work effectively as a team with technical and administrative staff, and to treat technical and administrative staff with respect.
- To participate effectively in teaching conferences.
- To participate effectively in multidisciplinary conferences that include pediatric cytopathology participation.

Systems-Based Practice

- To develop an understanding of the role of quality assurance in cytopathology by participating in quality assurance data collection, documentation, and reviews.
- To select appropriate, effective special studies for cytopathology cases.
- To understand the use of laboratory informatics systems in anatomic pathology, for ordering, reporting, quality assurance, and billing purposes.

- To apply current tumor staging and grading systems, and understand the role of these in data collection for tumor registries and national cancer databases.

Practice-Based Learning

- To use case-based learning as a tool for additional insights into disease pathogenesis.
- To locate, appraise, and assimilate pertinent evidence from scientific studies.
- To demonstrate effective problem-solving skills in pediatric cytopathology, using a wide variety of information resources.

**Pediatric Pathology
Neuropathology Rotation**

Rotation Director: Jiancong Liang, MD PhD

The Pediatric Pathology Fellow spends one month in the Neuropathology Division, working up and signing out Neuropathology cases that involve pediatric patients. The Fellow also reviews Pediatric Neuropathology study sets that encompass most of the clinicopathologic entities expected for the Fellow to acquire proficiency. During this rotation, the Fellow should become familiar with the workup and diagnosis of common pediatric CNS tumors and other pathologies.

Additionally, during the Routines rotation, the Fellow is expected to be present during the review of the Neuropathology frozen section slides. When possible, the Pediatric Pathology Fellow works with the Neuropathology resident/fellow during the work-up and sign-out of these cases.

**Pediatric Pathology
Neuropathology Rotation
Specific Goals and Objectives**

Patient care

- To become competent in the work-up and diagnosis of pediatric neuropathology specimens in order to practice independently in an academic or community hospital.
- To develop proficiency in diagnostic pediatric neuropathology.
- To develop proficiency in the description and handling of pediatric gross neuropathology specimens.
- To understand how neuropathology diagnoses are applied to therapeutic decision-making by the surgical and clinical staff.
- To develop proficiency in performance and interpretation of neuropathology frozen section diagnoses.
- To learn appropriate application of ancillary techniques such as immunohistochemistry, genetics, molecular testing, and electron microscopy to neuropathology specimens.
- To serve as a first-line consultant regarding pediatric neuropathology diagnoses for the clinical staff.

Medical knowledge

- To refine conceptual understanding of pediatric central nervous system disorders and correlation with morphology.
- To achieve competency in recognizing commonly observed lesions in pediatric central nervous system specimens.
- To refine an investigatory and analytic cognitive approach to pediatric neuropathology diagnoses.
- To understand the role of intraoperative Neuropathology consultations in clinical decision making.
- To understand the correlation of morphology with genetic and molecular alterations in pediatric central nervous system pathology.
- To understand the scientific basis and practical applications of ancillary techniques such as immunohistochemistry, genetics, and molecular studies to pediatric central nervous system diseases.
- To correlate neuropathology findings with clinical presentation, treatment and prognostic indicators.
- To understand and apply the systems in current usage for classifying and reporting pediatric central nervous system malignant neoplasia.

Interpersonal and communication skills

- To develop proficiency in presentation of pediatric neuropathology findings to pathologists, medical students, residents and clinicians.
- To use effective writing skills and appropriate terminology to generate the pediatric neuropathology report.
- To teach pathology residents on neuropathology rotations with an emphasis on frozen section analysis,

gross specimen examination, and microscopic interpretation.

- To learn to communicate effectively with surgeons about intraoperative consultations and pathologic diagnoses
- To prepare accurate, effective, concise written reports.
- To ensure that the hand-over of cases occurs correctly, consistently and without errors.

Professionalism

- To demonstrate respect, compassion, and integrity in encounters with patients, clinicians, other residents, and staff in the setting of pediatric neuropathology.
- To complete written reports in a timely fashion.
- To work effectively as a team with technical and administrative staff, and treat technical and administrative staff with respect.
- To participate effectively in pediatric neuropathology teaching conferences.
- To participate effectively in multidisciplinary conferences that include neuropathology presentations.
- To work effectively as a team with clinicians, pathology assistants, pathology technologists and other technical staff, and treat clinical, technical and administrative staff with respect.
- To know the limits of scope of authority and limitations of knowledge, requesting assistance before these are breached.

Systems-based practice

- To develop an understanding of the role of quality assurance in diagnostic pediatric neuropathology by participating in quality assurance data collection, documentation, and reviews.
- To select appropriate, effective special studies for pediatric neuropathology cases.
- To understand safety in pediatric neuropathology and the role of OSHA in setting workplace safety standards.
- To understand the use of laboratory informatics systems in pediatric pathology, for ordering, reporting, quality assurance, and billing purposes.
- To apply current tumor staging and grading systems, and understand the role of these in data collection for tumor registries and national cancer databases.

Practice-based learning

- To use case-based learning as a tool for additional insight into disease pathogenesis.
- To locate, appraise, and assimilate pertinent evidence from scientific studies.
- To gain an understanding of newer technologies available for pediatric neuropathology diagnoses.
- To demonstrate effective problem-solving skills in pediatric neuropathology, using a wide variety of information resources.

**Pediatric Pathology
Hematopathology Rotation**

Rotation Directory: Emily F. Mason, M.D., Ph.D.

The Hematopathology B service is covered jointly by Hematopathology fellows and VUMC pathology senior residents. Fellows participate in the work-up, sign out, and report generation of a wide variety of cases of hematopoietic/lymphoid disorders, including lymphomas, leukemias, and reactive disorders. Fellows are responsible in cooperation with the attending Pathologist for the sign-out of in-house bone marrow biopsies as well as in-house tissue biopsies from VUMC Adult and Pediatric Hospitals. In addition, fellows are responsible for outside consultations/referred bone marrow biopsies for patients to be seen at Vanderbilt. Residents and fellows will be responsible for up to 10 cases per day on the HPB service. Overflow cases will be handled by the attending. As fellows gain experience, they are given increasing responsibility for the triage of cases, including upfront immunohistochemical orders and communication of final diagnoses with clinicians after the sign-out of cases. Fellows on the HPB service will take the role of supporting the junior resident on the HPA service, ensuring that the case load is appropriate for the more junior resident's level, and training them in the work flow. Fellows will participate in the hematopathology intradivisional consensus conference and may also participate in the medical student education activities of the division.

Many of the in-house tissue biopsies come from patients who are seriously ill and require an expedited diagnosis. Fellows learn how to respond appropriately to such stressful circumstances and learn to communicate appropriately with clinical colleagues facing complex diagnostic/therapeutic challenges.

ROTATION FACULTY:

Ridas Juskevicius M.D, Rotation Director (Residency); Mary Ann Arildsen, M.D., Ph.D., Jonathan Douds, M.D., David Head, M.D., Emily Mason, M.D., Ph.D., Kelley Mast, M.D., Claudio A. Mosse, M.D., Ph.D.; Adam Seegmiller, M.D., Aaron Shaver, M.D., Ph.D.

**Pediatric Pathology
Hematopathology Rotation
Specific Goals and Objectives**

Patient Care

- Understand and direct the collection and processing of specimens for diagnostic studies.
- Gather essential and accurate information about patients.
- Develop an appropriate diagnostic plan/differential diagnosis based on clinical questions and available laboratory data.
- Interpret pathology and integrate clinical, flow cytometric, immunohistochemical and genetic data to make a correct diagnosis.
- Understand the importance of timeliness in delivery of diagnosis.
- Use literature/internet to support diagnoses in difficult cases.
- Effectively communicate findings to clinical staff both orally and in written reports.

Medical Knowledge

- Demonstrate sufficient knowledge of medicine to generate differential diagnoses appropriate to clinical and pathological findings.

- Acquire relevant medical knowledge and apply it to constructing and testing new paradigms in the practice of pathology.

Practice-Based Learning and Improvement

- Analyze practice experience and perform practice-based improvement in cognitive knowledge, observational skills, formulating a synthesis and impression, and procedural skills.
- Demonstrate critical assessment of the scientific literature.
- Demonstrate knowledge of and apply the principles of evidence-based medicine in practice.
- Use multiple sources, including information technology to optimize life-long learning and support patient care decisions.
- Facilitate the learning of students, peers, and other health care professionals through presentations at intramural conferences.

Interpersonal and Communication Skills

- Provide clear, informative and concise written reports which include a precise diagnosis, a differential diagnosis when appropriate and relevant supportive morphologic and laboratory data as well as related literature.
- Understand the importance of timeliness in delivery of diagnosis.
- Demonstrate effectiveness in face-to-face listening and speaking to clinical staff and support personnel.
- Possess appropriate telephone communication skills.
- Effectively present pathologic findings, differential diagnosis and relevant literature at conferences with house staff and colleagues.

Professionalism

- Responsibility - Punctual and prepared for sign-out. Assumes ownership of cases and responsible for diagnosis.
- Compassionate in understanding and respecting the needs of patients, their families and the staff and physicians caring for patients.
- Demonstrate professional excellence in providing diagnostic services to patients.
- Demonstrate knowledge of regulatory issues pertaining to the use of human subjects in research.
- Understand the importance of timeliness in delivery of diagnosis.

Systems-Based Practice

- Demonstrate the ability to design or improve cost effectiveness of care plans based on knowledge of best practices.

COMPETENCIES AND SKILLS AT CONCLUSION OF TRAINING

By the end of the fellowship program, the Pediatric Pathology Fellow should have mastery in the following skills and competencies:

Surgical Pathology:

1. Properly grosses, photographs, samples and selects tissue for frozen and permanent sections.
2. Appropriately handles tumors for National Protocols (i.e.: Children's Oncology Group, National Wilms Tumor Study, Intergroup Rhabdomyosarcoma Study, American Joint Committee on Cancer, College of American Pathology)
3. Accurately diagnoses common and significant pediatric lesions employing algorithms and ancillary studies to resolve a meaningful differential diagnosis (i.e.: pediatric tumors, common malformations, inflammatory conditions, maldevelopment, allograft rejections, common GI disorders), consulting literature, as appropriate, for cost effective utilization.
4. Identifies genetic translocation, features of common diseases and syndromes, cytogenetic abnormalities, molecular genetic abnormalities associated with common pediatric tumors.
5. Maintains proper professional working environment in surgical pathology laboratory, coordinating activities of technical and clerical staff and other professionals and employs good communication skills with clinicians and staff.
6. Composes complete and accurate reports using synoptic formats as required.
7. Reports diagnostic information back to clinical staff in frozen section, tumor boards and for case presentations including conveying unexpected or unwelcome information.
8. Participates in laboratory inspection following CAP checklist.
9. Participates in employee interviews and evaluations.
10. Participates in a quality improvement project.

Fetal-Maternal Pathology:

1. Proper grossing of single and multiple placentas (appropriately documents and samples).
2. Recognizes common gross developmental abnormalities.
3. Performs fetal examinations without assistance (both intact and fragmented fetal specimens).
4. Identifies genetic translocation, features of common inherited disorders and syndromes, including the cytogenetic abnormalities, molecular genetic abnormalities associated with these.

Autopsy Pathology:

1. Performs complete pediatric autopsy or fetopsy unassisted, collects appropriate data, handles specimens for different types of cases including congenital malformations, disruptions and deformations, syndromes, suspected accidental and non-accidental trauma, sexual abuse, toxic death, infections in immunosuppressed hosts, recognizes common malformations and complexes as related to chromosomal abnormalities or gestational abnormalities, recognizes common deformations caused by trauma, caused by intrauterine or extrauterine injuries.
2. Understands medical/legal responsibility for reporting deaths to civil authority under TN code.
3. Able to complete fetopsy/autopsy reports in an accurate and timely fashion.

Hematopathology:

1. Demonstrates working knowledge of pediatric hematologic malignancies and blood disorders.

2. Demonstrate knowledge of diagnostic algorithms for hematologic malignancies incorporating light microscopy, molecular genetics, cytogenetics, and flow cytometry in clinical lab results.

Neuropathology:

1. Perform consultation for operative specimens of common pediatric brain tumors
2. Demonstrates knowledge of normal and abnormal brain development in fetus neonate and older children.
3. Accurately diagnose common pediatric brain tumors using appropriate ancillary studies, immunohistochemistry and cytogenetics.
4. Process pediatric malignancies according to standard research and treatment protocols.
5. Accurately diagnose pediatric myopathies.

Cytology:

1. Able to diagnose fine needle aspiration (FNA) specimens from common pediatric sources including lymph nodes, thyroids, and superficial tumors.