I. GOALS AND OBJECTIVES

The Pediatric Pathology rotation provides an introduction to basic principles of pediatric anatomic and clinical pathology. Residents participate in diagnostic studies of pediatric autopsies, neuropathology, surgical pathology, cytogenetics, nephropathology and clinical pathology. Attached is a list of topics that residents should be familiar with by the end of the rotation. Any of the pathologists can help you retrieve cases that illustrate these diagnoses. See attached competency based objectives.

II. DURATION OF THE EXPERIENCE

The resident's required core rotation in Pediatric Pathology is three months in length and includes 2 weeks experience in cytogenetics. Electives of one to three months are also available.

III. DUTIES AND RESPONSIBILITIES

A. Residents are expected to gross in all unusual surgicals on a daily basis. The following day, they review surgical slides, write (or dictate) a microscopic description and diagnosis before reviewing cases with the attending pathologist. Sign out is usually from 2:00 to 4:00 p.m. every day.

B. Residents are expected to present their gross and microscopic findings of surgical and autopsy cases at clinical conferences including Tumor Board, Surgical, Cardiology, Orthopedics and Neonatology Conferences.

C. Residents should be able to perform a minimum of 5 pediatric autopsies. Review of the clinical history, gross dissection and blocking cases should be done by the resident under the pathologist’s supervision. The PAD should be completed after consulting with the attending pathologist. Residents should review dictation, slides and write a microscopic description for each organ and write the FAD prior to bringing the case for review with the attending. After review of the case and discussion of the findings, the resident will write a summary/discussion which will include a clinicopathologic correlation and discussion of each of the major anatomic findings. References should be included. Final anatomic diagnoses must be completed within 30 business days of the gross examination.

A. SURGICAL PATHOLOGY
The resident is expected to complete the gross and microscopic description and arrive at a
diagnosis for all surgical specimens received each day during the rotation. The resident
is expected to sign out cases with the staff pathologist on a daily basis. Study of complex
or interesting cases may include evaluation of Immunohistochemistry, Electron
Microscopy and literature research with the advice of the staff pathologist. Clinical
correlation is stressed and the resident is expected to review charts, see patients and
consult with clinicians on interesting cases.

During the weeks the resident is on the Anatomic Pathology Service, he/she can also
evaluate pediatric renal biopsies, including writing the description and interpretation of
the light and electron microscopy and the immunofluorescence studies. The resident can
also review muscle biopsies, including immunohistochemistry results, with the
pathologist on service.

At the end of the rotation, the resident should be familiar with the pathology of frequently
encountered pediatric specimens including placentas, tumors, gastrointestinal biopsies,
kidneys and lymph nodes.

Fourth year residents on electives should be able to handle at least 80% of their surgical
cases independently, ordering appropriate special stains, E.M., etc., writing reports and
consulting with clinicians.

B. AUTOPSY PATHOLOGY

While at Cardinal Glennon Hospital, the resident will do 5 to 10 autopsies under the
supervision of a staff pathologist. As many autopsies as possible will be done during the
first weeks of the resident rotation to allow adequate time for study of autopsies. The
resident's responsibilities include external examination, gross dissection, taking
photographs of appropriate gross pathology, taking sections for microscopic study,
writing a clinical summary, gross and microscopic description and provisional and final
anatomic diagnosis.

The provisional anatomic diagnosis and the clinical summary and gross description
should be completed within 24 hours of the post-mortem examination. The diagnosis is
reviewed by the staff pathologist prior to being typed. Brain cutting is
conducted every Tuesday morning; if a brain from one of the Glennon’s cases is to be
cut by the neuropathologist, he must be at the brain cutting and prepared to provide
details of the clinical history and gross dissection to the neuropathologist. Microscopic
slides (including the neuro-pathological material) are to be reviewed by the resident, and
microscopic description written. The slides will then be reviewed by the staff
pathologist. A final summary/discussion and final anatomic diagnosis will be written
with the guidance of the staff pathologist. Special stains and literature research may be
required on interesting or complex cases. The resident is expected to complete all of his
autopsies as promptly as possible, within 30 business days of the gross examination, and
all autopsies are to be completed optimally while the resident is at Cardinal Glennon.
Although every other weekend is normally free, the resident will need this time to read on interesting cases and complete post-mortems or other discussions. On the weekends that the resident is on call, they will be available at the hospital, at home, or by telephone or beeper.

At the end of the rotation, the resident should be able to perform a complete pediatric autopsy. He should be familiar with and able to appropriately employ special techniques to evaluate infectious diseases, metabolic diseases, malignancies, congenital malformations including cardiac and CNS malformations, karyotypic abnormalities and myopathies.

Fourth year residents should be able to perform pediatric autopsies including complicated dissections independently.

C. PEDIATRIC CLINICAL PATHOLOGY

During the three-month rotation on pediatric pathology, the resident will, under the supervision of staff pathologists, investigate and make clinical correlations of unusual or unexpected laboratory findings.

Residents will have the opportunity to review clinical chemistry, microbiology, virology, hematology and blood banking during their rotation. Residents will review and offer diagnosis on bone marrow aspirates, under the supervision of the attending pathologists.

D. MOLECULAR-CYTOGENETICS

The resident will spend two weeks on molecular-cytogenetics in the Molecular-Cytogenetics Laboratory at Cardinal Glennon Hospital. (Residents have the option of taking four weeks of training in this area if they desire a longer experience in cytogenetics.) During this two week time period, the resident will become familiar with basic principles of clinical cytogenetics, including indications for chromosome analysis, techniques for culturing, harvesting, and banding of different specimens including bone marrow, blood, amniotic fluid, chorionic villi sampling and solid tumors. The resident will be exposed to special cases that require molecular studies such as fluorescent in-situ hybridization, southern blotting and polymerase chain reaction. The resident will learn the significance of chromosome study as far as diagnosis and prognosis by going through different abnormal cases of different applications; i.e., benign and malignant tumors, complex malformations, etc. Upon every detected abnormal case occurring during the rotation, a series of educational questions will be generated for the resident to answer covering some basic board exam questions. The resident will have hands-on techniques by setting up an actual patient with the help of a senior technologist or a supervisor. The resident will be asked to incorporate any pathological results with those of cytogenetic of any particular case set-up during the rotation period. The resident will be asked to discuss this data during cytogenetic meetings.
Method of objective assessment includes a serial of questions generated from actual 
abnormal cases. The resident is asked to answer these questions in writing followed by a 
verbal discussion with the director of the lab.

E. CALL

Residents are on Anatomic and Clinical Pathology Call at Cardinal Glennon Hospital 
approximately every third week. During call, residents are expected to answer problems 
and provide consultations as needed in the Clinical Pathology Laboratory. They are also 
On Call to perform autopsies and frozen sections, always under the direct supervision of 
an attending Pathologist.

Call responsibilities at Cardinal Glennon Children's Hospital should not conflict with 
University Hospital call. Holidays at the University Hospital and Medical School may 
not be holidays at Cardinal Glennon Children's Hospital. Residents are expected to be 
present on all Cardinal Glennon working days.

F. CONFERENCES

Residents are encouraged to attend conferences that include discussions of pediatric 
pathology. They are expected to attend and present when their cases are discussed. 
Conferences are as follows:

1. Check out rounds: Monday and Friday 8:00-8:15 AM, Pinkerton Conference Room, 4th 
Floor, University Hospital.

2. Resident Lecture Series: Monday 8:15-9:15 AM, weekly, Pinkerton Conference Room, 
4th Floor, University Hospital. Residents are free from responsibilities at CGCH during 
this time and are expected to attend the conference.

3. Chairman’s Rounds: Monday, Noon, biweekly, LRC Auditorium B.

4. Neuro Brain Cutting: Tuesday 9:30-10:30 AM, weekly, UH Morgue

5. Muscle Pathology: Friday 2-3 PM, 3rd week, CGCH Residents Room.

6. Cardiology Conference: Tuesday 3-4 PM, second week, CGCH Pathology Conf. Room.


8. Neonatal Pathology: Wednesday 4-5 PM, 4th week, CGCH Pathology Conference 
Room. The resident will present his autopsy cases.

9. Tumor Board: Thursday 8:15-9 AM, weekly, Conf. Room No. 2, Marian Hall.
10. **Pediatric Surgical Pathology**: Thursday 1-2 PM, 1st and 3rd week, CGCH Pathology-Radiology Conference Room. The resident presents gross and microscopic findings on any cases of interest to the surgeons.

11. **Surgical Pathology/Frozen Section Slide Conf.**: Friday 8-9 AM, weekly, Pinkerton Conference Room, UH, 4th Floor. Residents are expected to present a pediatric pathology case each week at Surgical Pathology Unknown conference.

G. **DAILY SCHEDULE**

   The resident is expected to be present in the Department of Pathology each day, Monday through Friday, from 7:45 A.M. through 5:15 P.M. at a minimum. Residents are expected to invest time as required to fulfill routine obligations (preparations for conferences, completion of service work, etc.) and, to read about cases seen.

IV. **TEACHING STAFF**

The teaching faculty at Cardinal Glennon includes:

Jacqueline Batanian, Ph.D., Director of Cytogenetics, CGCH Office 577-5393
David S. Brink, M.D., Director of Anatomic Pathology Laboratory, CGCH Office 268-4043
Linda Ellis, M.D., Associate Pathologist, CGCH Office 577-5624
Necat Havlioglu, M.D., Neuropathology, UH Office 577-8782
Beth Levy, M.D., Neuropathology, UH Office 577-8782
Cirilo Sotelo, M.D., Director of Pathology and Clinical Laboratories, CGCH Office 268-6424
Ella Swierkosz, Ph.D., Director of Microbiology and Virology, CGCH Office 577-5644
Carole Vogler, M.D., Director of Residency Training Program, CGCH Office 577-5348

V. **MANNER OF SUPERVISION AND EVALUATION**

The resident will receive an initial orientation by the Director of the Laboratories. Informal feedback while on this rotation and a final evaluation at the end of the rotation will also be provided. The rotation evaluation is based on a consensus drawn from individual evaluations of each of the pediatric pathologists who has worked with the resident on the rotation. If the resident is having difficulties during the rotation, this will be discussed with the resident in an informal manner approximately one-half of the way through the rotation.

VI. **OUTCOME ASSESSMENT METHODS**

At the end of three months, residents are evaluated by the Director. This is accompanied by examining 25 H&E slides randomly selected from the multiple teaching sets available in the Department. Results of the review and the evaluation, signed by both the resident taking the examination and the Director, are placed in the resident’s file.

Rev. 6/2006
Ped Path Objectives
Competency based objectives for pediatric pathology

Patient care
1. Understand specific roles of Pediatric Pathologist in the clinical pediatric and pediatric surgery practice
2. Learn to read and understand pediatric hospital charts for complicated, interesting surgical pathology and autopsy cases.
3. Appreciate the roles of the perinatal pathologist in the immediate diagnosis for care and treatment of mother and infant, determination of primary and secondary causes of perinatal morbidity and mortality, and genetic counseling and prediction of recurrence risk
4. Read and understand obstetric and neonatal intensive care unit hospital charts

Medical Knowledge
Have a working familiarity with the etiology, diagnosis, and treatment of all cases included on the attached list of cases. These include
1. Pediatric tumors:
   a. "Small, round blue cell tumors" - neuroblastoma, primitive neuroectodermal tumor, intraabdominal desmoplastic round cell tumor;
   b. Renal tumors- Wilms' tumor, mesoblastic nephroma,
   c. Pediatric bone and soft tissue tumors- rhabdomyosarcoma, osteosarcoma,
   d. Germ cell tumors- yolk sac carcinoma, teratoma,
   e. Liver tumors- hepatoblastoma, hepatocellular carcinoma
   f. Lymphomas including Hodgkin's disease
   g. Childhood leukemias
   h. Pediatric brain tumors,
      i. Histiocytic disorders-Langerhans cell histiocytosis, Rosai-Dorfman disease
2. Gastrointestinal diseases: including reflex esophagitis, Hirschsprung's disease, neonatal necrotizing enterocolitis, malabsorption syndromes, inflammatory bowel disease, infectious colitis, allergic disorders.
3. Genitourinary diseases: reflux uropathy, undescended testes, herniorrhaphies
4. Hepatobiliary tract diseases: infantile cholestasis, autoimmune and drug induced hepatitis, others
5. Diseases of Placenta and Fetus: spontaneous abortion, ectopic pregnancy, intrauterine fetal death, preterm birth, fetal growth restriction, preeclampsia, acute and chronic abruption, perinatal asphyxia, congenital infections (toxoplasmosis, rubella, cytomegalovirus, herpes, syphilis), chorioamnionitis, villitis
6. Chromosomal Abnormalities: trisomies 13, 18, 21, monosomy X, triploidy
7. Major Congenital Malformations hypoplastic left heart; ventricular septal defect, atrial septal defect, tetralogy of Fallot, truncus arteriosus, anomalous pulmonary venous return, endocardial cushion defects, patent ductus arteriosus, coarctation of aorta, Eisenmenger's syndrome, neural tube defects, hydrocephalus, Potter's syndrome, osteochondrodysplasias
9. Metabolic diseases: glycogen storage diseases, Wilson's disease, Niemann Pick, Gaucher, tyrosinemia, galactosemia, urea cycle enzyme deficiencies, fatty acid oxidation defects
10. Infections: pediatric AIDS, lymphadenitis, osteomyelitis, H. Pylori, infections of immunocompromised host
11. Immunologic disorders: AIDS, congenital immunodeficiency, autoimmune disease, asthma and allergy
12. Transplant Pathology (liver, bone marrow, skin, kidney): rejection, vascular problems, associated conditions
14. Endocrine conditions: congenital adrenal hyperplasia, hyperinsulinemia, thyroid disease, calcium and bone disorders, intersex disorders

**Practice Based Learning and Improvement**

Acquire and master the following skills:

1. Admit, rectify, and learn from errors
2. Surgical gross room techniques for evaluation of tumor resections, explant organs, organs removed for non-neoplastic disease, skin specimens, bone specimens, open lung biopsies, endomyocardial biopsies, rectal suction biopsies
3. Autopsy techniques for older child with particular reference to congenital heart disease, malignancy, metabolic disease, infection
4. Autopsy techniques for fetuses (fragmented or intact), stillbirths, and neonatal deaths with or without congenital anomalies
5. Normal Histology: fetal, neonatal
6. Interpretation of pediatric clinical pathology tests including, metabolic disease screens, hemoglobin electrophoresis, flow cytometry of leukemia-lymphoma, cytogenetics of congenital anomalies and pediatric tumors, granulocyte function studies, pediatric blood transfusion
7. Interpretation of perinatal clinical pathology tests: Kleihauer-Betke test, maternal-fetal antibody testing, serology of infection and autoimmune disorders, blood gas interpretation
8. Gross and microscopic examination: spontaneous abortion, fetuses and newborns third trimester placenta
9. Research: Identify areas of potential investigation, Formulate methods appropriate to carry out a potential research project

**Interpersonal and communication skills**
1. Acquire a clinically relevant patient history from the chart and treating physician

2. Compose a pertinent autopsy discussion clearly stating the primary and underlying causes of death

3. Render and communicate diagnoses in a precise, unambiguous, and clinically responsive manner

4. Present pediatric tumors and other cases at clinical and pathology conferences

5. Discuss the diagnosis and interpretation of perinatal and pediatric surgical pathology, autopsy, and frozen section cases with the treating physician

**Professionalism**

1. Appreciate the role of and interact appropriately with ancillary staff: pathology assistants, histology, transcription

2. Respond in a timely manner to all clinical questions and calls. Complete surgical cases and autopsy cases within established timeline guidelines

3. Triage and prioritize surgical and autopsy cases

4. Understand and keep appropriate patient confidentiality following HIPPA guidelines

**System Based Practice**

1. Use hospital information system to gather patient data.

2. Master all aspects of the HBOC LIS

3. Use computers to access information from online databases

4. Follow CAP and OSHA guidelines for writing reports, working with potentially infectious specimens