**General Description:**

- Autopsy is an important component of pathology training and it is critical for understanding the disease processes leading to death as well as pathophysiological events related to a given condition. The autopsy serves two primary purposes: 1) provide definitive information regarding a disease process which occurred during the life of the patient and lead to death to patient. The autopsy may reveal at the same time other significant contributory factors to death, as well as other conditions that are not directly to death; 2) provide important information that is beneficial and brings closure to the family.

- Autopsies are performed as a one-month rotation for at UMN during the first and third/fourth of AP residency. Autopsies are also performed at the V.A. Medical Center as part of the general pathology rotations. In addition, residents will have a one-month rotation at the Hennepin County Medical Examiner Office during either the third or the fourth year of residency.

- The number of autopsy cases performed each year at UMN ranges between 170-190 per year, the majority being adult complete and limited autopsies as well as pediatric cases (including fetal autopsies).

- The first step in performing the autopsy is verification of all case documents and to ensure that proper consent for the autopsy is obtained from the next of kin. Residents are responsible for verifying that a valid autopsy permit has been obtained BEFORE the autopsy procedure starts. Do not proceed until this critical step is accomplished. If you are not certain regarding this point, contact the autopsy rotation director or the attending staff pathologist and verify with him/her that you have a valid permit prior to starting the procedure.

- Training regarding autopsy document verification and performing autopsy procedure is performed by the Pathologist Assistant assigned to the case and/or the Decedent Care Specialist.

- In specific situations, consultation of the autopsy director is necessary to ensure that the autopsy documentation is in accordance to the institutional and state regulations.

- After communication with the Pathology Assistant/DCS the resident may begin to review the patient’s chart material, the autopsy consultation request, the authorization for postmortem examination, and the report of death checklist. The resident will review the patient’s medical record and will try to reach out to the clinical team to obtain additional information regarding patient’s clinical course, clinical suspected cause of death and specific clinical questions that need to be addressed during autopsy.

- Autopsy attendance of a member of the clinical team is always encouraged. The clinician should be asked whether s/he would like to be called when the autopsy is finished.

- Before autopsy is performed, the resident will discuss the case with the attending pathologist to determine the best approach to the case, the goals/techniques of the autopsy to be performed and the collection of appropriate specimens for ancillary testing.

- The resident then performs the autopsy with the aid of the DCS and the PA, using either en-block evisceration (Letulle method) or organ-by-organ approach (Virchow method).

- After the autopsy, the resident will review the gross findings with the attending pathologists and will be responsible to obtain the appropriate sections for microscopic examination.

- Taking photographs of important gross autopsy findings is critical. Autopsy photographs must be taken to include external (all cases will include photographs of the body as received and after removal of medical devices) and internal organs with major gross pathology.

- The resident is responsible to outline the preliminary autopsy diagnosis (PAD) that must be signed-out by the attending pathologist within 24 hours from the completion of autopsy.
In order to be considered a complete autopsy, the resident who performed the autopsy must also take part in the brain cutting, slide examination, report writing and neuropathology sign-out for their cases. Residents who have since switched onto a new rotation will be excused from their rotation to complete these tasks. Brain cutting conference takes place at 8:45AM on Tuesdays approximately 2 weeks after the autopsy. Alternate arrangements can be made with the attending neuropathologist to do the brain cutting at a different time if needed.

The resident will preview the glass slides once received and will write the final autopsy report before meeting with the attending pathologist to sign-out the case.

First-year residents will be under continuous guidance through the entire process by the PA/DCS and attending pathologist, however, it is generally expected that residents with six or more autopsy cases will demonstrate an increasing degree of independence regarding the entire procedure as well as writing the preliminary autopsy diagnosis and the final report.

The attending pathologist is always available for consultation through this process, regardless of the resident’s training level.

The more advanced residents are also expected to accurately outline the cause of death, significant contributory factors to death and the manner of death, in a format similar to the certificate of death. This section is included in the final autopsy report as part of the case diagnosis (see autopsy template).

Residents are expected to present autopsy results at clinical conferences, such as Internal medicine and Pediatrics M&M Conferences

Once every 4-6 weeks, the resident who completed the autopsy rotation the month before will be responsible to select and present the most interesting cases to the Autopsy Conference for peer residents, under supervision of the autopsy rotation director.

Residents are always involved in signing out the cases with the attending pathologist

It is expected that the resident reviews cases, requests ancillary studies in consultation with the attending pathologist, enters diagnoses in CoPath and sits with the attending pathologist for final sign out.

Before case sign-out, it is expected that the resident understands the pertinent clinical history, the gross examination findings, the microscopic examination and has already updated the final autopsy report prior to sitting at the microscope with the attending pathologist

The report entered by the resident should include:

- Final Diagnoses, entered in a standard format for each specimen, using provided templates
- Establishing the anatomic cause of death, significant contributory factors to death and the manner of death
- Clear and pertinent clinical summary in lay terminology, easy to understand by nonmedical individuals (keep in mind that copies of the final autopsy report are provided to the next of keen who consented for the autopsy to be performed; therefore, try to avoid complex medical terms and simplify the information as much as possible)
- Clinico-pathologic correlation specific to the autopsy case as well as supporting literature where appropriate
- Gross description, in a clear and complete form, following provided autopsy templates for adult and pediatric cases, as appropriate
- Outline and interpret the microscopic examination findings
- Outline the additional tests, as appropriate

Residents are encouraged to work on research projects involving series or interesting case reports. Support and mentoring by the attending pathologist is provided.

Goals and Objectives of the Autopsy Rotation:
- Upon completion of all four rotations in autopsy, each resident is required to have participated in all aspects of autopsy for a total of 50 combined limited and complete autopsy cases (including
not more than 5 fetal autopsies); this represents a critical requirement for being able to take the pathology board examinations (ABP) at the completion of AP/CP or AP only residency training

- Timely update the ACGME autopsy log form within not more than two weeks from completion and sign-out of each autopsy case (verification of completion of the ACGME autopsy log form is periodically performed by the GME staff)
- Become familiar with the Minnesota state medicolegal system and autopsy legal requirements in United States
- Understand the difference between a clinical/hospital autopsy and a forensic case, the purpose of consultation of the medical examiner office and when an autopsy represents a medicolegal case
- Obtain/verify proper documentation for each case and ensure proper consent for autopsy and type (complete vs. limited) signed by the next-of-kin is in the case file before starting autopsy
- Understand the use of clinical information and the health record in autopsy examination and identify the clinical issues to be addressed and resolved by the gross/microscopic autopsy examination
- Use proper biosafety measures/protection to minimize/eliminate risk of injury and/or contamination with body fluids during autopsy
- Demonstrate awareness of biosafety considerations and risk minimization prior to performing the postmortem examination in infectious cases (HBV/HCV, tuberculosis, HIV etc.)
- Confirm identity of the body prior to autopsy
- Learn about special needs of certain religions
- Demonstrate and apply strong knowledge of human anatomy, physiology and biochemistry
- Procure body fluid samples in a manner that avoids contamination of the biospecimen at the start of the post mortem examination (these include peripheral blood, vitreous fluid, urine, ascites, pleural fluid as appropriate to each case)
- Demonstrate the ability to perform autopsy procedure using both enblock and organ-by-organ evisceration techniques and properly document autopsy findings (case notes, photographs)
- Learn how to classify, describe and document injuries on external and internal examination, if present
- Become proficient in performing a thorough and systematic dissection of the organs and record the autopsy findings (descriptions, diagrams and photographs)
- Learn the technique for removing the brain and the spinal cord
- Learn how to identify and recognize the anatomical findings specific to disease processes
- Demonstrate a superior and detailed knowledge of the normal gross and light microscopic appearance of tissues and recognize the gross and microscopic appearance of diseased tissues
- Understand the principles of cell biology, immunology and pathophysiologic mechanisms that lead to observed changes due to specific conditions
- Anticipate and discuss with the attending pathologist the need for and appropriate retention of whole organs that require fixation/decalcification before further dissection and examination case-specific scenarios (e.g. retention of the heart in negative autopsies or fixation and decalcification before sectioning coronary arteries with advanced/severe calcific atherosclerosis
- Demonstrate the ability to order appropriate ancillary testing (biochemistry, microbiology, special histologic stains, immunohistochemistry and/or toxicology, as appropriate to the case)
- Identify post mortem changes and artifacts due to decomposition and differentiate from disease processes
- Demonstrate the ability to interpret postmortem findings, appropriately search for literature supporting clinicopathologic correlation for the cause of death/significant contributory factors to death and clinical course of disease
• Understand and apply the difference between cause and manner of death
• Seek appropriate case-specific consultations (e.g. lung and cardiac pathology, medical renal pathology, neuropathology etc.)
• Discuss the results of the autopsy examination with the clinical team at the end of the post mortem examination and demonstrate sufficient experience in clinical medicine to advise on the significance of pathological findings
• Following preliminary findings at autopsy, demonstrate the ability to select appropriate further investigations, if necessary (e.g. use of collected body fluids for laboratory culture or toxicology examination, if appropriate to the case)
• Seek advice of the attending pathologist or the autopsy service director before ordering toxicology studies in the rare cases where these studies may be necessary; learn how to properly complete the toxicology submission form and what is the most appropriate specimen to be sent for testing for that specific case
• Demonstrate ability to complete of the biochemistry analysis and/or microbiology submission forms, as appropriate to the specific autopsy case
• Demonstrate the ability to correctly order in CoPath the relevant ancillary investigation, as appropriate/necessary to that specific autopsy case
• Prepare the draft of the preliminary autopsy diagnosis (PAD) and final autopsy report (FAD) in a clear, concise, free of typographical or interpretation mistakes/omissions
• Perform highest quality work with integrity and compassion
• Exhibit appropriate personal and interpersonal professional behavior
• Demonstrate respect for all genders, cultures and ethnic groups in autopsy practice
• For senior residents: act as appropriate role model when mentoring first year residents
• Demonstrate a professional attitude and courtesy to the other members of the autopsy team, including pathologist assistants and decedent care specialist

ACGME core competencies:
The learning objectives below reference the corresponding ACGME core competencies: Patient Care (PC), Medical Knowledge (MK), Professionalism (Prof), Communication Skills (CS), Practice Based Learning and Improvement (PBLI), and Systems-Based Practice (SBP):

• Ensure proper autopsy documentation/consent before starting the autopsy (Prof, SBP)
• Efficient communication with the clinical team (PC, Prof, CS)
• Accurately update and timely complete the ACGME autopsy log form after each autopsy case sign-out (Prof, SBP)
• Identify the important aspects and clinical questions for the autopsy case (PC, MK)
• Gross examination of internal organs with subsequent microscopic examination, correlate gross and microscopic findings (PC, MK, SBP)
• Participation in the daily consensus meetings (CS, Prof, PBLI)
• Assuming responsibility in the sign-out commensurate to the level of training (PC, MK)
• Engagement in autopsy conferences and M&M meetings (Prof, CS, PBLI, MK)
• Involvement in research projects in clinical autopsy cases (MK, PBLI)
• Engagement in intradepartmental discussions with colleagues, supporting staff and faculty (Prof, MK)
• Understanding of the role of ancillary testing in the diagnosis of important autopsy findings (MK, PBLI, SBP)

Assigned Reading:
• Manual of Surgical Pathology, by Susan C. Lester or Surgical Pathology Dissection, by William H. Westra, et al (residents should be acquainted with pertinent sections from major internal organs)
Residents are expected to do literature searches, as appropriate, that will support the interpretation of the autopsy findings, cause of death and the clinic-pathologic correlation for each autopsy case.

Optional Reading:
- Additional articles pertaining to discussed pathologic entities

Call Duties - Weekends and holidays: The resident must check the Specimen Receiving pager (which they will carry) for pending autopsy pages. If the resident is paged, they must call the Specimen Receiving voice mail (directions are on the pager) to get the information concerning pending autopsies. It is the resident’s responsibility to call the staff pathologist and the autopsy staff on-call to notify them of the pending autopsy.

During the rotation, the trainee is expected to join the following Conferences:
- Daily consensus conference (Benson, 2:00 PM)
- Brain cutting conference (Morgue, 8:45 AM)
- Wednesday unknown slide conference (Bell, 7:00 AM)
- Weekly Grand Rounds (MCRB 450, Wednesdays at 8:00 AM)
- Wednesday didactic lecture (Bell, 9:15 AM)
- Thursday cytopathology conference/journal club (Bell, 12:00 PM)
- Thursday morning gross conference (Bell, 7:00 AM)
- Autopsy gross and microscopic conference (Thursday morning, Bell, 7:00 AM)

Other Requirements:
- Maintain personal and accurate autopsy log that is concordant to the ACGME autopsy log form

Assessment Method:
Resident performance on this rotation will be assessed by:
- Performance evaluation will be completed by attending pathologists and/or the autopsy director at the end of the rotation. All residents will be evaluated based on each core competency described above.