

2019

**MINOR REVISION - OCTOBER 2023
VERSION 1.1**

Effective for residents who enter training on or after July 1, 2019.

DEFINITION

Diagnostic and Molecular Pathology¹ is the branch of medicine concerned with the study of the morphologic and molecular aspects of disease. It includes the domains of surgical pathology, autopsy pathology, cytopathology, and molecular pathology, and it is essential to patient care because it provides a foundation on which clinical decisions are made.

DIAGNOSTIC AND MOLECULAR PATHOLOGY PRACTICE

Diagnostic and molecular pathologists are physicians responsible for examining tissues submitted to the laboratory for the purposes of investigating and diagnosing the mechanisms of disease. They gather information at the macroscopic, microscopic, immunohistochemical, and molecular levels that is used for clinical correlation. Diagnostic and molecular pathologists use their expertise and skills to inform and guide clinical decisions for patients of all ages. They study all organ systems, including breast, cardiovascular, dermal, endocrine, gastrointestinal, genitourinary, gynecological, head and neck, hematopoietic, musculoskeletal, neural and muscular, ophthalmic, renal, and respiratory. They use ancillary laboratory techniques, including immunohistochemistry, immunofluorescence, in situ hybridization, flow cytometry, molecular pathology, and electron microscopy. In addition to supporting patient care, diagnostic and molecular pathologists provide the definitive summary of penultimate clinical events, performing autopsies in complex medical cases and in cases of sudden and/or unexpected death.

Diagnostic and molecular pathologists are members of the clinical care team. Their practice may be community hospital-based, commercial laboratory-based, hospital-based, and/or university-based, and it is most often practised in group settings. The complexity of practice and the degree to which a physician focuses their practice can vary in all of these settings.

Because of its integral focus on understanding disease processes, Diagnostic and Molecular Pathology is a foundational discipline upon which a significant portion of modern medicine is built. The specialty continues to evolve due to advances in technological complexity, expanding medical knowledge, and emerging technologies—including an increased focus on personalized and precision medicine. Concentration of practice and an enhanced molecular focus have emerged within Diagnostic and Molecular Pathology as a response to ever-

¹ Formerly recognized by the Royal College as Anatomical Pathology. The discipline name change was officially approved in July 2023.

increasing sophistication in patient management and the need to stay at the cutting edge of knowledge, technology, and the best practice of medicine.

DIAGNOSTIC AND MOLECULAR PATHOLOGY COMPETENCIES

Medical Expert

Definition:

As *Medical Experts*, diagnostic and molecular pathologists integrate all of the CanMEDS Roles, applying medical knowledge, clinical skills, and professional values in their provision of high-quality and safe patient-centred care. Medical Expert is the central physician Role in the CanMEDS Framework and defines the physician's clinical scope of practice.

Key and Enabling Competencies: Diagnostic and molecular pathologists are able to...

1. Practise medicine within their defined scope of practice and expertise

- 1.1. Demonstrate a commitment to high-quality care of their patients
- 1.2. Integrate the CanMEDS Intrinsic Roles into their practice of Diagnostic and Molecular Pathology
- 1.3. Apply knowledge of the clinical and biomedical sciences relevant to Diagnostic and Molecular Pathology
 - 1.3.1. Normal anatomy and its common variants, as relevant to surgical and autopsy pathology
 - 1.3.2. Normal physiology and biochemistry
 - 1.3.3. Principles of embryologic development and common variations of normal development
 - 1.3.4. Principles of cell biology, immunology, genetics, and pathogenic mechanisms, and the changes that occur in disease states
 - 1.3.5. Normal gross, light microscopic, and ultrastructural appearance of tissues
 - 1.3.6. Appearance of normal cells in cytologic preparations
 - 1.3.7. Gross and microscopic appearance of inflammatory and neoplastic conditions, in both histological and cytological material, in all organ systems
 - 1.3.8. Natural history of cancers, including risk factors, incidence, prevalence, genetic predisposition, growth and dissemination patterns, and prognostic variables
 - 1.3.8.1. Staging and risk stratification of cancers using the tumour-node-metastasis (TNM) staging system, other relevant classification systems, and applicable predictive and prognostic indices
 - 1.3.8.2. Clinical sequelae of rendering diagnostic and prognostic information
 - 1.3.8.3. Indications and expected outcomes of systemic therapy, surgery, radiation therapy, and multimodality therapy for patients with cancer

- 1.3.9. Principles of tissue fixation, decalcification, processing, and routine histochemical staining
- 1.3.10. Principles of light microscopy, including polarization and dark field microscopy
- 1.3.11. Principles of ancillary diagnostic techniques and their application in diagnosis
 - 1.3.11.1. Special histochemical stains
 - 1.3.11.2. Immunohistochemistry and in situ hybridization (ISH), including fluorescent in situ hybridization (FISH)
 - 1.3.11.3. Immunofluorescence
 - 1.3.11.4. Molecular pathology, including cytogenetics
 - 1.3.11.5. Flow cytometry
 - 1.3.11.6. Electron microscopy
- 1.3.12. Correlation of biochemical, microbiological, and radiological studies with pathology findings
- 1.3.13. Principles of digital photography and slide scanning
- 1.3.14. Principles of autopsy, both hospital and medico-legal
 - 1.3.14.1. Characteristics of autopsies requiring referral to pathologists with forensic expertise
- 1.3.15. Principles of quality assurance pertinent to surgical, cytology, and autopsy pathology
- 1.4. Perform timely diagnostic assessments with recommendations that are presented in an organized manner
 - 1.4.1. Perform a pathology consultation, including the preparation of a complete report and recommendations, in response to a request from another physician or a medico-legal authority such as a coroner
 - 1.4.1.1. Complete pathology reports within appropriate turnaround times
 - 1.4.2. Synthesize cases for discussion at multidisciplinary rounds
- 1.5. Carry out professional duties in the face of multiple competing demands
- 1.6. Recognize and respond to the complexity, uncertainty, and ambiguity inherent in medical practice
 - 1.6.1. Demonstrate insight into their own limits of expertise
 - 1.6.2. Convey diagnostic uncertainty and recommend additional studies when needed

2. Perform a clinicopathologic assessment of a case

- 2.1. Prioritize issues to be addressed in a patient encounter or case
 - 2.1.1. Identify and address clinical and laboratory-based issues to be addressed in the pre-analytical, analytical, and post-analytical handling of a case
- 2.2. Gather information from the clinical assessment and the medical chart, select appropriate investigations, and interpret the results for the purpose of diagnosis and management, disease prevention, and health promotion
 - 2.2.1. Obtain a relevant clinical history
 - 2.2.2. Assess specimen adequacy in surgical and cytopathology specimens
 - 2.2.3. Perform a gross and microscopic pathological examination that is focused and relevant
 - 2.2.4. Formulate a differential diagnosis based on the pathological examination
 - 2.2.5. Select ancillary techniques judiciously in a resource-effective and ethical manner
 - 2.2.6. Establish a final diagnosis that takes into account clinical correlations
- 2.3. Provide diagnostic and prognostic information to help clinicians establish goals of care in collaboration with patients and their families², which may include slowing disease progression, treating symptoms, achieving cure, improving function, and palliation
- 2.4. Contribute to a patient-centred management plan
 - 2.4.1. Guide therapy with a complete and accurate pathology report

3. Plan and perform tests and procedures for the purposes of diagnosis and case management

- 3.1. Determine the most appropriate tests and procedures
- 3.2. Ensure appropriate consent has been obtained and documented for autopsies, genetic testing, research, or other tests
- 3.3. Prioritize a procedure or test, taking into account clinical urgency and available resources
 - 3.3.1. Prioritize ancillary investigations when specimen adequacy is limited
- 3.4. Perform a procedure in a skilful and safe manner, adapting to unanticipated findings or changing clinical circumstances

² Throughout this document, references to the patient's family are intended to include all those who are personally significant to the patient and are concerned with his or her care, including, according to the patient's circumstances, family members, partners, caregivers, legal guardians, and substitute decision-makers.

- 3.4.1. Perform appropriate dissection, description, and sampling of routine and complex surgical specimens for routine and ancillary procedures
- 3.4.2. Prepare frozen sections, including imprint cytology specimens when relevant, and review for diagnosis
- 3.4.3. Take high quality photographs of gross and microscopic specimens
- 3.4.4. Perform complete autopsies across the spectrum of age, with appropriate full description and diagnosis at gross and microscopic levels
- 3.4.5. Perform complete forensic autopsies, including obtaining samples for toxicology and the submission of specimens to the forensic sciences laboratory
- 3.4.6. Interpret the findings of autopsies in the context of the relevant clinical history
- 3.4.7. Use interventions appropriately for diagnostic and preventative purposes
 - 3.4.7.1. Utilize appropriate ancillary techniques, including molecular tests and cytogenetics, for family counselling and screening
 - 3.4.7.2. Recognize patterns of familial cancer syndromes, using or suggesting appropriate ancillary tests to guide genetic counselling
 - 3.4.7.3. Utilize other areas of laboratory medicine, including microbiology, for diagnostic and preventative interventions
 - 3.4.7.4. Recognize communicable diseases
- 3.4.8. Use digital microscopy and interpret gross and microscopic digital images, including digitized and scanned slides

4. Establish plans for ongoing case management and, when appropriate, timely consultation

- 4.1. Implement an action plan that supports ongoing case management, including follow-up on additional investigations, supplemental reporting, and further consultation as needed
 - 4.1.1. Ensure adequate follow-up is arranged when a pathologist performs a diagnostic procedure or orders a test
 - 4.1.2. Determine the need and timing of referral to another specialist and/or second opinion

5. Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety

- 5.1. Recognize and respond to harm from health care delivery, including patient safety incidents
 - 5.1.1. Resolve issues related to specimen misidentification and diagnostic errors

- 5.2. Adopt strategies that promote patient safety and address human and system factors
 - 5.2.1. Adhere to quality management processes throughout the pre-analytic, analytic, and post-analytic phase
 - 5.2.2. Apply safe practices in the laboratory, intraoperative consultation suite, and autopsy suite to minimize occupational risk

Communicator

Definition:

As *Communicators*, diagnostic and molecular pathologists interact with patients and their families to facilitate the gathering and sharing of essential information for effective health care.

Key and Enabling Competencies: Diagnostic and molecular pathologists are able to...

1. Establish professional relationships with patients and their families

- 1.1. Communicate using a patient-centred approach that encourages patient trust and autonomy and is characterized by empathy, respect, and compassion
- 1.2. Optimize the physical environment for the dignity and privacy of human tissue and deceased persons
- 1.3. Recognize when the perspectives, values, or biases of patients, physicians, or other health care professionals may have an impact on the quality of care, and modify the approach to the patient accordingly
 - 1.3.1. Ensure appropriate communication with patients and/or family members with respect to the handling of surgical and autopsy procedures in the context of a multicultural society
- 1.4. Respond to a patient's non-verbal behaviours to enhance communication
- 1.5. Manage disagreements and emotionally charged conversations
- 1.6. Adapt to the unique needs and preferences of each patient and to his or her clinical condition and circumstances

2. Elicit and synthesize accurate and relevant information, incorporating the perspectives of patients and their families

- 2.1. Use patient-centred interviewing skills to effectively gather relevant biomedical and psychosocial information
- 2.2. Provide a clear structure for and manage the flow of an entire patient encounter

- 2.3. Seek and integrate relevant information from other sources, including the patient's family, with the patient's consent

3. Share health care information and plans with patients and their families

- 3.1. Share information and explanations that are clear, accurate, and timely, while checking for patient and family understanding
 - 3.1.1. Convey surgical pathology and autopsy findings to patients and families clearly and compassionately
 - 3.1.1.1. Demonstrate awareness of the most responsible physician-patient relationship and the boundaries applicable to the diagnostic and molecular pathologist's role
- 3.2. Disclose harmful patient safety incidents to patients and their families accurately and appropriately
 - 3.2.1. Communicate and document issues arising from a breach in quality or safety of laboratory practices

4. Document and share written and electronic information about the pathology encounter to optimize clinical decision-making, and patient safety, confidentiality, and privacy

- 4.1. Document the pathology encounter in an accurate, complete, timely, and accessible manner, in compliance with regulatory and legal requirements
 - 4.1.1. Prepare clear, concise, comprehensive, and timely written reports for surgical pathology, cytopathology, and autopsy consultations
 - 4.1.1.1. Use synoptic reports and other standard report formats, as appropriate
 - 4.1.1.2. Integrate information from ancillary studies and other diagnostic sources into the pathology report
 - 4.1.2. Communicate findings in a timely fashion, with appropriate documentation
 - 4.1.3. Communicate critical values or unexpected results in a timely manner
- 4.2. Communicate effectively using a written health record, electronic medical record, or other digital technology
- 4.3. Share information with patients and others in a manner that enhances understanding and that respects patient privacy and confidentiality

Collaborator

Definition:

As *Collaborators*, diagnostic and molecular pathologists work effectively with other health care professionals to provide safe, high-quality, patient-centred care.

Key and Enabling Competencies: Diagnostic and molecular pathologists are able to...

1. Work effectively with physicians and other colleagues in the health care professions

- 1.1. Establish and maintain positive relationships with physicians and other colleagues in the health care professions to support relationship-centred collaborative care
- 1.2. Negotiate overlapping and shared responsibilities with physicians and other colleagues in the health care professions in episodic and ongoing care
 - 1.2.1. Recognize and respect the diversity of roles, responsibilities, and competencies of other professionals in relation to their own
 - 1.2.2. Work effectively with laboratory technologists and pathology assistants, directing their assistance during specimen handling and autopsy procedures
 - 1.2.3. Work effectively with managers of technical staff
 - 1.2.4. Interact effectively with surgeons during intraoperative consultations
 - 1.2.4.1. Convey diagnostic uncertainty and discuss deferral of diagnosis when needed
- 1.3. Engage in respectful shared decision-making with physicians and other colleagues in the health care professions
 - 1.3.1. Provide advice to clinical colleagues regarding procurement and handling of histologic and cytologic specimens
 - 1.3.2. Discuss indications for appropriate use of intra-operative and urgent consultations
 - 1.3.3. Convey information from the pathology assessment to clinicians in a manner that enhances patient management
 - 1.3.3.1. Encourage discussion, questions, and interaction relevant to the case
 - 1.3.4. Contribute effectively at multidisciplinary rounds, presenting and discussing pathology findings
 - 1.3.5. Support clinical colleagues in the development and implementation of a management plan, when appropriate

2. Work with physicians and other colleagues in the health care professions to promote understanding, manage differences, and resolve conflicts

- 2.1. Show respect toward collaborators
- 2.2. Implement strategies to promote understanding, manage differences, and resolve conflict in a manner that supports a collaborative culture

3. Work with physicians and other colleagues in the health care professions to effectively enable continuity of case management

- 3.1. Determine when a case should be transferred to another pathologist with differing expertise
- 3.2. Demonstrate safe handover of case management, using both oral and written communication as needed

Leader

Definition:

As *Leaders*, diagnostic and molecular pathologists engage with others to contribute to a vision of a high-quality health care system and take responsibility for the delivery of excellent patient care through their activities as clinicians, administrators, scholars, or teachers.

Key and Enabling Competencies: Diagnostic and molecular pathologists are able to...

1. Contribute to the improvement of health care delivery in teams, organizations, and systems

- 1.1. Apply the science of quality improvement to contribute to improving systems of patient care
 - 1.1.1. Participate in quality assurance and quality control in the pathology laboratory and in the broader health care system, as appropriate
 - 1.1.2. Demonstrate knowledge of metrics and measurement systems used to track quality management and safety activities
 - 1.1.3. Demonstrate knowledge of process improvement methodologies
 - 1.1.4. Contribute to the identification of quality management or safety problems in the pathology laboratory, the formulation and execution of a plan of action, and the assessment of that plan
 - 1.1.5. Participate in multidisciplinary morbidity and mortality rounds
- 1.2. Contribute to a culture that promotes patient safety
- 1.3. Analyze patient safety incidents to enhance systems of care
- 1.4. Use health informatics to improve the quality of patient care and optimize patient safety

2. Engage in the stewardship of health care resources

- 2.1. Allocate health care resources for optimal patient care
- 2.2. Apply evidence and management processes to achieve cost-appropriate care

3. Demonstrate leadership in health care systems

- 3.1. Demonstrate leadership skills to enhance health care
 - 3.1.1. Describe the structure and function of the health care system as it relates to Diagnostic and Molecular Pathology, including the roles of pathologists and other physicians
 - 3.1.2. Demonstrate knowledge of the principles of laboratory management, including resource allocation, collaboration with technical managers, and hospital and laboratory administration
- 3.2. Facilitate change in health care to enhance services and outcomes
 - 3.2.1. Reinforce to the public and health care professionals the essential contribution of laboratory medicine to clinical care and patient health

4. Manage career planning, finances, and health human resources in personal practice(s)

- 4.1. Set priorities and manage time to integrate practice and personal life
- 4.2. Manage personal professional practice(s) and career
 - 4.2.1. Describe the principles of workload measurement within the laboratory
- 4.3. Implement processes to ensure personal practice improvement

Health Advocate

Definition:

As Health Advocates, diagnostic and molecular pathologists contribute their expertise and influence as they work with communities or patient populations to improve health. They work with those they serve to determine and understand needs, speak on behalf of others when required, and support the mobilization of resources to effect change.

Key and Enabling Competencies: Diagnostic and molecular pathologists are able to...

- 1. Respond to an individual patient's health needs by advocating with the patient within and beyond the clinical environment**
 - 1.1. Work with patients to address determinants of health that affect them and their access to needed health services or resources
 - 1.1.1. Respond to individual patient diagnostic needs and issues as part of case management

- 1.2. Incorporate disease prevention, health promotion, and health surveillance into individual pathology encounters
 - 1.2.1. Describe the importance of screening in the early detection and treatment of certain cancers
 - 1.2.2. Describe the role of molecular methods used to screen for familial cancer syndromes
 - 1.2.3. Alert treating physicians when potentially detectable inherited conditions are encountered

2. Respond to the needs of the communities or populations they serve by advocating with them for system-level change in a socially accountable manner

- 2.1. Work with a community or population to identify the determinants of health that affect them
- 2.2. Improve community or population health by applying a process of continuous quality improvement to disease prevention, health promotion, and health surveillance activities
 - 2.2.1. Evaluate laboratory practices and test selection regularly to ensure they meet community needs
- 2.3. Contribute to a process to improve health in the community or population they serve

Scholar

Definition:

As *Scholars*, diagnostic and molecular pathologists demonstrate a lifelong commitment to excellence in practice through continuous learning, and by teaching others, evaluating evidence, and contributing to scholarship.

Key and Enabling Competencies: Diagnostic and molecular pathologists are able to...

1. Engage in the continuous enhancement of their professional activities through ongoing learning

- 1.1. Develop, implement, monitor, and revise a personal learning plan to enhance professional practice
- 1.2. Identify opportunities for learning and improvement by regularly reflecting on and assessing their performance using various internal and external data sources
- 1.3. Engage in collaborative learning to continuously improve personal practice and contribute to collective improvements in practice

2. Teach students, residents, the public, and other health care professionals

- 2.1. Recognize the influence of role-modelling and the impact of the formal, informal, and hidden curriculum on learners
- 2.2. Promote a safe and respectful learning environment
- 2.3. Ensure patient safety is maintained when learners are involved
- 2.4. Plan and deliver a learning activity
- 2.5. Provide feedback to enhance learning and performance
- 2.6. Assess and evaluate learners, teachers, and programs in an educationally appropriate manner

3. Integrate best available evidence into practice

- 3.1. Recognize practice uncertainty and knowledge gaps in clinical and other professional encounters and generate focused questions that can address them
- 3.2. Identify, select, and navigate pre-appraised resources
- 3.3. Critically evaluate the integrity, reliability, and applicability of health-related research and literature
- 3.4. Integrate evidence into decision-making in their practice

4. Contribute to the creation and dissemination of knowledge and practices applicable to health

- 4.1. Demonstrate an understanding of the scientific principles of research and scholarly inquiry and the role of research evidence in health care
- 4.2. Identify ethical principles for research and incorporate them into obtaining informed consent, considering potential harms and benefits, and considering vulnerable populations
- 4.3. Contribute to the work of a research program
- 4.4. Pose questions amenable to scholarly investigation and select appropriate methods to address them
- 4.5. Summarize and communicate to professional and lay audiences, including patients and their families, the findings of relevant research and scholarly inquiry

Professional

Definition:

As *Professionals*, diagnostic and molecular pathologists are committed to the health and well-being of individual patients and society through ethical practice, high personal standards of behaviour, accountability to the profession and society, physician-led regulation, and maintenance of personal health.

Key and Enabling Competencies: Diagnostic and molecular pathologists are able

to...

1. Demonstrate a commitment to patients by applying best practices and adhering to high ethical standards

- 1.1. Exhibit appropriate professional behaviours and relationships in all aspects of practice, demonstrating honesty, integrity, humility, commitment, compassion, respect, altruism, respect for diversity, and maintenance of confidentiality
- 1.2. Demonstrate a commitment to excellence in all aspects of practice
- 1.3. Recognize and respond to ethical issues encountered in practice
 - 1.3.1. Describe the role and apply knowledge of the ethics of genetic screening in family planning and for hereditary cancers
- 1.4. Recognize and manage conflicts of interest
- 1.5. Exhibit professional behaviours in the use of technology-enabled communication

2. Demonstrate a commitment to society by recognizing and responding to societal expectations in health care

- 2.1. Demonstrate accountability to patients, society, and the profession by responding to societal expectations of physicians
- 2.2. Demonstrate a commitment to patient safety and quality improvement

3. Demonstrate a commitment to the profession by adhering to standards and participating in physician-led regulation

- 3.1. Fulfil and adhere to the professional and ethical codes, standards of practice, and laws governing practice
 - 3.1.1. Adhere to local regulations regarding autopsy consent and the reporting of deaths to the medical examiner or coroner
 - 3.1.2. Apply knowledge regarding regulations for tissue submission to a laboratory and retention of tissue for research and education purposes
 - 3.1.3. Describe the principles and practice of presenting pathological evidence in a court of law
 - 3.1.4. Fulfil the requirements of the physician's duty to report, including communicable disease, and suspected child, domestic, or elder abuse
- 3.2. Recognize and respond to unprofessional and unethical behaviours in physicians and other colleagues in the health care professions
- 3.3. Participate in peer assessment and standard setting
 - 3.3.1. Explain the roles of intra- and extradepartmental reviews of diagnostic pathology material
 - 3.3.2. Demonstrate a commitment to excellence in the discipline by participating in regular peer review

4. Demonstrate a commitment to physician health and well-being to foster optimal patient care

- 4.1. Exhibit self-awareness and manage influences on personal well-being and professional performance
 - 4.1.1. Demonstrate a commitment to safe practices in Diagnostic and Molecular Pathology to minimize occupational risk
- 4.2. Manage personal and professional demands for a sustainable career as a diagnostic and molecular pathologist
- 4.3. Promote a culture that recognizes, supports, and responds effectively to colleagues in need

This document is to be reviewed by the Specialty Committee in Diagnostic and Molecular Pathology by December 31, 2026.

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Approved – Specialty Standards Review Committee – September 2018

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