Medical Biochemistry – Definition and Roles of Medical Biochemists

Medical Biochemistry is a specialty branch of medicine concerned with biochemistry and metabolism as related to human health and disease. It is a discipline recognized by the Royal College of Physicians and Surgeons of Canada as a subspecialty of Internal Medicine and Pediatrics.

Medical Biochemists are physicians who diagnose diseases, manage patients with disorders of biochemistry and metabolism, and provide consultation to other clinicians. Medical Biochemists apply their clinical knowledge when interpreting laboratory data and integrate this information into patient care. The Medical Biochemist is a part of the medical consultative team for direct and indirect patient care, and may admit patients as the most responsible physician. Medical Biochemists are registered members of provincial physician colleges. They work in the community or at acute care institutions, and are active medical staff members of health care organizations.

By nature, Medical Biochemistry has a broad base in medicine and operates in many phases of health care. Medical Biochemistry also provides a basis for health promotion and illness prevention, and thus Medical Biochemists play a key role in communicating with individuals and communities to improve individual and population health.

Medical Biochemists are at the interface between patient care and overarching stewardship for the production of biochemical information in laboratory and bedside settings. They are trained in the operation and management of clinical laboratories, supporting primarily biochemistry laboratories that test blood, urine, and other body fluid samples through various laboratory techniques. Medical Biochemists provide medical insight on clinical test selection and implementation, point-of-care tests, interpretation of test results, as well as supervising the chemistry laboratories to meet accreditation standards.

Medical biochemists advocate for effective patient-centred care through effective utilization management. They conduct translational research that helps bring biomarkers to clinical practice. They facilitate the application of biochemical data in the detection, confirmation, and/or monitoring of diseases, and play an important role in supporting disease surveillance and chronic disease management. This includes education and support of patients, individuals, and communities in health promotion, prevention and management of chronic diseases, emerging areas of digital technology, and patient self-care, etc.

Medical Biochemists support the professional and educational activities of medical students, residents, and fellows, and have a significant impact on health care.

The primary responsibilities of a Medical Biochemist include:

- Providing medical and laboratory assistance in the screening, diagnosis, management, monitoring and prognosis of disease in patients across all age ranges by:

    - Participating in patient access and flow, and care transitions
    - Providing consultation on the interpretation of laboratory tests, based on a patient's history, imaging and other clinical information from colleagues
    - Proactively consulting with and being available for consultation to clinical colleagues on the selection and interpretation of laboratory tests to ensure timely and appropriate patient care
    - Augmenting and modifying test requests in an appropriate and consultative manner, and helping other professionals to use laboratory services efficiently
    - Facilitating the development and implementation of practice guidelines provincially, nationally, and internationally
    - Promoting early risk identification and early prevention in chronic disease management

- Recommending, medically supervising, performing and interpreting endocrine dynamic testing on patients. Medical Biochemists may provide a consultative report based on these results and suggest follow up management as necessary
- Being involved in direct patient care for specific diseases such as lipid disorders, diabetes, nutrition-based disorders, endocrine disorders, bone diseases, as well as inherited metabolic diseases. Medical Biochemists provide individual biochemical consultation and follow-up both for hospital and community-based patients
- Providing medical oversight for newborn screening, prenatal screening, tumor markers, and toxicology laboratories. Medical Biochemists are key members of multidisciplinary care teams and have a significant role in population-based screening programs
- Taking responsibility for other activities as appropriate in the hospital, and at provincial and national levels

○ Supporting biochemistry testing laboratories by:

- Providing medical supervision and clinical patient care in the processes of sample acquisition and related procedures.
- Implementing and reviewing quality procedures in the laboratory
- Introducing new tests and withdrawing obsolete tests
- Assisting in the selection of test analyzers and assays
- Assisting in the establishment of appropriate reference intervals and clinical decision points
- Defining and establishing critical values and other parameters such as turnaround times to meet both the standards of clinical practice and regulatory requirements
- Overseeing and implementing point-of-care testing and its integration into the laboratory information system, and its interpretation along with laboratory test results
- Reviewing test order frequencies and test utilization by establishing appropriate testing algorithms
- Taking responsibility for other activities as appropriate and required

○ Education and research

- Medical Biochemists are actively involved in medical residency training and are the primary contacts to communicate with the Royal College of Physicians and Surgeons of Canada.
- Actively promote education and knowledge translation to colleagues and communities through interpretation of results, communication with patients, and education of clinical colleagues via formal and informal presentations
- Educate technical and administrative laboratory staff on the clinical implications of testing and reporting of results
- Conduct quality improvement projects which are patient-centred and family-focused
- Conduct basic, translational, and clinical research to engage and collaborate with clinical colleagues to close gaps in patient care
- Taking responsibility for other activities as appropriate and required

In summary, Medical Biochemists are medical experts in biochemical medicine who work in academic health centres, regional hospitals, reference and community laboratories, private offices, industry, government agencies and other settings. This work is done as part of an interdisciplinary team alongside clinical chemists, laboratory scientists, medical technologists, information analysts, administrators, and other health professionals.