

**Enhanced Practice**

**Bone Mineral Densitometry**

**COMPETENCY PROFILE**



Prepared by  
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## Ontario Association of Medical Radiation Technologists

# Enhanced Practice Competency Profile For Bone Mineral Densitometry

### Assumptions

Assumed prerequisite knowledge, skills and professional attributes:

The Technologist

1. Has completed an accredited Medical Radiation Technology program and is certified to practice in Canada
2. Is employed in a Diagnostic Imaging, Radiation Therapy or Nuclear Medicine department (or clinic)
3. Fosters inter-professional collaboration with other allied healthcare professionals in providing clinical services
4. Carries personal Professional Liability Insurance (PLI)
5. Has performed a minimum of 100 BMD exams with a corroborating letter from a reporting Radiologist
6. Is a member of a Regulatory College or Professional Association with Regulatory Authority (where applicable)

## Required Competencies

The following competencies must be met to qualify for the Enhanced Practice Certificate in Bone Mineral Densitometry.

A1 Apply principles of Professional Practice and Quality Assurance	
A1.1	Recognize cultural diversity of the patient population
A1.2	Practice established principles of infection control
A1.3	Apply provincial, territorial or state privacy legislation and regulations in practice
A1.4	Recognize the mechanics of falls and advocate for their prevention
A1.5	Identify standard operating procedures of the facility
A1.6	Recognize potential errors and demonstrate the ability to modify parameters to improve outcomes for the scan
A1.7	Participate in Quality Assurance (QA) activities to achieve Continuous Quality Improvement (CQI)
A1.8	Practice according to the Code of Ethics of the provincial, territorial or state jurisdiction

B1 Demonstrate knowledge of Anatomy	
B1.1	Outline the basic formation of bone and its composition
B1.2	Outline the structure and function of bone
B1.3	Identify the factors regulating bone growth
B1.4	Identify the process of maintaining, repairing and remodeling bone
B1.5	Identify anatomy specific to BMD
B1.6	Identify the anatomy of the spine; normal and abnormal curvatures
B1.7	Identify the anatomy of the pelvis, hip and femur

B1.8	Identify the anatomy of the forearm
B1.9	Recognize normal anatomy and normal variants
B1.10	Recognize abnormal anatomy

## C1 Demonstrate knowledge of Pathology

C1.1	Define osteoporosis and explain its etiology
C1.2	Identify the factors necessary to achieve peak bone mass
C1.3	Identify the risk factors that contribute to peak bone mass
C1.4	Identify primary and secondary factors that can contribute to bone loss
C1.5	Identify disorders that may cause low bone mass and/or osteoporosis
C1.6	Distinguish between primary and secondary osteoporosis types
C1.7	Identify clinical tests used to determine low bone mass
C1.8	Describe the micro architecture of bone and outline it's deterioration process
C1.9	Identify the consequences of low bone mass and osteoporosis
C1.10	Identify pathologies that cause reduced bone density

## D1 Demonstrate knowledge of Pharmacology and Treatment Options

D1.1	Identify major and minor risk factors that increase susceptibility to osteoporosis
D1.2	Identify pharmacological interventions used for prevention and treatment of osteoporosis
D1.3	Distinguish between the various lifestyle interventions that can help to prevent or slow down the onset of osteoporosis
D1.4	Identify pharmaceuticals that can reduce bone density

D1.5	Identify pharmaceuticals commonly prescribed for patients at high risk for fracture
D1.6	Differentiate clinical rationales necessitating BMD testing
D1.7	Outline the relevance of the history questionnaire

<b>E1 Demonstrate knowledge of X-Ray Production and Quality Control</b>	
E1.1	Relate the basic principles of x-ray production including beam filtration to absorbed radiation dose
E1.2	Outline the construction and operation of BMD equipment
E1.3	Relate the principles of BMD to the use of filters, type and absorbed radiation dose
E1.4	Apply computational methodology to acquire and analyze scan results
E1.5	Recognize the provincial, territorial or state regulations concerning the installation of a BMD unit
E1.6	Conceptualize the value of a comprehensive Quality Control (QC) procedure
E1.7	Outline the statistical terms and Shewhart rules used in QC and precision testing
E1.8	Perform QC activities and compile accurate results
E1.9	Evaluate QC data and generate the required course of action
E1.10	Provide an accurate explanation to patients concerning radiation exposure associated with BMD testing
E1.11	Apply established radiation safety measures following the ALARA principle
E1.12	Outline safety features of the equipment
E1.13	Recognize the need to plan regular preventative maintenance for the equipment
E1.14	Conform to provincial, territorial or state legislation and regulations pertaining to operation and safe use of ionizing radiation emitting devices

F1 Provide Exemplary Patient Care (Pre-scan)	
F1.1	Accurately evaluate the patient questionnaire and record required information
F1.2	Obtain information from the patient and recognize if there are any contraindications to the procedure
F1.3	Assess the patient's physical and emotional compliance for the procedure
F1.4	Assess the patient for evidence of internal or external objects in the region of interest
F1.5	Plan scan parameters and body positioning (according to the patient's physical and emotional condition) to maximize established quality standards
F1.6	Respond supportively to questions and obtain consent for the procedure
F1.7	Evaluate and respond to the patient's emotional and physical needs prior to, during and after the procedure with appropriate verbal and non-verbal actions

G1 Perform Scanning and Analysis	
G1.1	Accurately interpret and enter patient demographics into the computer (BMD) database
G1.2	Demonstrate knowledge of the BMD unit being utilized
G 1.3	Identify pinch points, clearances, emergency stop buttons and weight limits
G1.4	Accurately perform routine positioning for scanning
G1.5	Perform BMD scan to acquire accurate diagnostic information
G1.6	Adapt scan parameters and body positioning appropriately for complex scans
G1.7	Document any deviations from Standard Operating Procedure (SOP)
G1.8	Recognize substandard quality positioning and scanning
G1.9	Accurately analyze all scans

H1 Perform Follow-Up Scanning and Analysis	
H1.1	Perform scan to established standards for reproducibility and accuracy (perform a technologist precision assessment)
H1.2	Relate the concept of accuracy and precision to follow-up scanning and analysis
H1.3	Evaluate previous studies
H1.4	Accurately perform a follow-up scan with regard to previous scan(s)
H1.5	Accurately analyze a follow-up scan with regard to previous scan(s)
H1.6	Recognize unexpected changes from previous scan(s)

I1 Apply Data Management Protocols	
I1.1	Send scan results and patient documentation for reporting
I1.2	Apply Best Practice Guidelines and adhere to provincial, territorial or state privacy legislation and regulations
I1.3	Apply Best Practice Guidelines pertaining to storage of patient data
I1.4	Maintain optimal performance of the scanner computer system

## Recommended Guidelines

***Please note that some of these recommendations and guidelines may not be feasible to follow in your facility.***

1. The practitioner is accountable to exercise the appropriate knowledge, skills and judgment as required by their regulatory body
2. An annual competency assessment for practitioners is completed by the facility
3. The practitioner should have current CPR training
4. The practitioner should participate in 35 hours of Continuous Professional Development (CPD) activities in the fields of bone densitometry, osteoporosis or metabolic bone disease every five years

## Glossary of Terms

The following terminology, as cited in this document is listed below. The terminology was derived and used specifically for the intentions of this Competency Profile and therefore may not be exactly representative of other generic definitions.

### **Inter-professional Collaboration**

Provision of healthcare services to patients by multiple health caregivers (from different disciplines) who work collaboratively to deliver quality care within and across different practice settings (team based approach) maximizing contributions of many healthcare professionals.

### **Continuous Quality Improvement (CQI)**

Improving and maintaining quality that involves ongoing assessment of services, followed by actions directed at improving the quality of services offered and maintaining quality standards as time evolves.

### **Quality Assurance (QA)**

Monitoring and evaluation of elements (of a service) following the implementation of Quality Control (QC) procedures. QA Reviews verify that quality outcomes (based on QC data) were met; target estimations were accurate and support the effectiveness of the QC program.

### **Quality Control (QC)**

A program to establish a system of routine technical activities to measure and control the quality of desired outcomes (data collection) that is used as part of a QA program.

**Professional Liability Insurance (PLI)**

Personal Professional Liability insurance for Medical Radiation Technologists that includes coverage for malpractice, criminal code charges, coroner's inquests and regulatory body hearings.