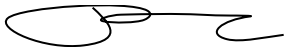
SIGN OFF SHEET

NAME	DATE	SIGNATURE
Pan Tran	2022-02-07	
Veronica Levin	2022-02-08	
Jamie Shi	2022-02-09	
Chris Lo	2022-02-10	C.L
Olga Nash	2022-02-11	
Elham Shahabi	2022-09-20	E.S.
2024	**2024**	**2024**
Reviewed and revised by Marlene McCarthy	August 12, 2024	
Dr. Peter Zia	August 19, 2024	
Dr. Phil Mok	August 19, 2024	

X-RAY ASSOCIATES

BMD MANUAL

The manual is reviewed and revised annually by Marlene McCarthy May 22, 2015

All manuals and protocols are reviewed and revised at least annually by the General Manager with input from department leads and final approval by the Quality Advisor.
It is the responsibility of all staff to notify the Lead or General Manager of any error or omissions in any manual. Staff must review all manuals and sign off annually. Staff are notified of updates as they occur, either via email, staff memos or in person.
It is expected that all policies and procedures are followed. They have been written to ensure patient and staff safety and support our Goals and Objectives.

Revised and/or Reviewed	Date	Name
Revised and Reviewed	May 22, 2015,	Marlene McCarthy
Revised and Reviewed	April 2016	Marlene McCarthy
Revised and Reviewed	October 2017	Marlene McCarthy
Revised and Reviewed	January & July 2019	Marlene McCarthy
Revised and Reviewed	January 2020	Marlene McCarthy
Revised and Reviewed	February 2021	Marlene McCarthy
Revised and Reviewed	January 2022	Marlene McCarthy
Revised and Reviewed	January 2023	Marlene McCarthy

GENERAL INFORMATION

All BMDs can be done as a walk in or booked every 20 minutes. Body Composition is 30 minutes.
No Barium, Calcium or CT dye injections before the exam.

Site Information	Equipment Information
X-Ray Associates **102-955 Major Mackenzie Dr.** **Vaughan, ON** **L6A 4P9** **Tel: 289 553-6336** **Fax: 289 553-6339**	**Manufacture: GE** **Model: Prodigy Advance** **SN: 75814-GA** **Year manufactured and acquired: 2010**
X-Ray Associates **125 Pedersen Dr., Units 3, 4, 5** **Aurora, ON** **L4G 0E3** **Tel: 905 751-1500** **Fax: 905 751-1505**	**Manufacture: GE** **Model: Prodigy Advance** **SN: 502665-MA** **Year manufactured: Dec 2017** **Year acquired: June 2018**

Service:

XTRON Imaging Inc.
#12- 1060
Britannia Rd. E.
Mississauga, On
L4W 4T1
Phone: 1 905 670-5051
Fax: 1 905 670-5053
Email: service@xtronimaging.com

Other Contacts:
QA: Dr. Philip Mok
RSO: Genti Cermjani
General Manager: Marlene McCarthy

Person Most Responsible for updating Manuals: Marlene McCarthy

If at anytime the machine fails and requires service, Contact XTRON and notify GM

Table of Contents

****It is important to always remember that we are a People Centered facility that includes patients families. We must respect the rights and responsibilities of patients and their essential care partners. When booking or upon arrival we must identify and ideally remove all barriers that may limit access to our services.**

Dress Code

This is a Professional Medical Office. It is important that you represent X-Ray Associates appropriately at all times.

The dress attire is a Uniform or **Business Casual with Lab coat**.

Lab coats are provided and must be worn at all times, if street clothes are worn. All clothes and lab coats should be clean, have no stains, and pressed. (not wrinkled).

Name tags will be provided for all staff and must be worn while on duty.

What is Business Casual Attire?

For women: A reasonable length skirt, mid-thigh or longer (no mini-skirt). Full-length trousers/slacks (not blue jeans) combined with a top (such as a dress shirt, polo, or sweater set) is considered acceptable. An informal dress with appropriate skirt mid- thigh length is acceptable. Yoga pants (leggings) are only acceptable if worn with a long top to mid-thigh or skirt to mid-thigh.

For men: A combination of a collared shirt (such as a dress shirt or polo shirt), cotton trousers (such as khakis or blue, green, brown, or black trousers) with a belt, and modest shoes (such as loafers) with socks is acceptable.

Unacceptable clothes for either Gender:

1. Gym clothes
2. Hooded tops/Sweat shirts
3. Blue jeans
4. Mini skirts
5. Rumpled or ripped clothing
6. Underwear as outerwear
7. Inappropriately revealing attire
8. Shorts
9. Sweat pants (Wind Pants)
10. No logos or graphics on tops or pants

Unacceptable for Admins: Yoga Pants

Unacceptable Foot Attire ALL staff:

1. Flip flops
2. Boots above the knee

Acceptable Foot Attire for either Gender Technologists:

1. Closed toe is mandatory
2. Running shoes
3. Must be rubber soles, non-slip
4. Heels must not be pointed nor greater than

MRT Duties and Responsibilities (see also separate Job Descriptions)

As self-regulated professionals and under the CMRITO's Standards of Practice, MRTs can practice only in those areas in which they have the education and experience, and only perform procedures for which they have the necessary knowledge, skills and judgement to perform effectively, safely and ethically. MRTs must comply with the CMRITO Standards of Practice (as described below) as well as facility policies/protocols.

MRTs are responsible for the day-to-day operation of the facility. These responsibilities include, but are not limited to the following:

1. Adhere to all relevant provincial and federal legislation and guidelines governing the practice of the profession, including the following:
   • CMRITO Standards of Practice • CMRITO Code of Ethics• CMRITO By-laws
   • CMRITO's sexual abuse prevention program • Medical Radiation Technology Act
   • Personal Health Information Protection Act • Health Care Consent Act

2. Adhere to the facility policies, procedure and protocols including:
   • Quality Control assessments
   • Cleaning of all equipment including ancillary equipment (e.g. patient tables, imaging machines lead protective equipment, computer keyboards,)
   • Maintain full records of incidents, unusual occurrences, reactions
   • Record and report any equipment faults or problems to the appropriate personnel
   • Use appropriate aseptic techniques and infection prevention and control practices in the course of the diagnostic or therapeutic procedure as per PIDAC/IPAC best practices (refer to 3.3.8 Infection Prevention and Control policies and procedures)

Patient Examination:

• Ensure appropriate delegations (when required), and appropriate knowledge, skills and judgement are in place for all examinations
• Follow facility policy regarding situations where the use of chaperones may be appropriate
• Ensure the room is prepared for the procedure specified in the order
• Select and set up the equipment and materials needed for the procedure specified in the order
• Ensure correct patient identification (e.g. confirmation of patient name, date of birth, examination to be performed, and physician/authorized health professional authorization is present)
• Confirm that the order is appropriate based on the patient history
• Inquire about and record any contraindications (e.g. pregnancy/ anaphylaxis) before starting the exam, as well as obtain and record the direction of the physician/authorized health professional to proceed, modify, or halt the exam as per facility policy
• Ensure that the worklist contains the correct patient information (if applicable)
• Obtain informed consent (oral or written as per facility policy) before each examination (after explaining the procedure and answering any questions)
• Ensure pertinent clinical history is available and supplement as necessary
• Instruct the patient to remove only the clothing and items that will interfere with the procedure, providing the patient with a gown or sheet to cover areas where clothing was removed and explaining to the patient when and where the MRT may touch them and why
• Follow facility protocols when unexpected findings are found that would require immediate attention (e.g. fracture)

Throughout the Examination:

• Assess the patient's condition before, during and after the procedure or course of treatment and make modifications to procedures based on the patient's physical, medical and/or emotional status and needs

• Maintain patient comfort, privacy and dignity at all times

• Stop procedure if at any time the patient withdraws consent and record withdrawal of consent and reason as per site protocol

• Ensure that the orientation of the body and other pertinent parameters are marked correctly on the image and data

• Ensure the processed image provides diagnostic image quality while using minimal radiation (ALARA – As Low As Reasonably Achievable). Take corrective action if necessary and record explanation of sub-optimal imaging

• Ensure the door to the examination room is self-closing and therefore closed during radiation exposures

• Ensure correct anatomy is displayed on image for accuracy of positioning

• Ensure that patient examination images and data contains patient name, ID number, date of examination and type of examination

• Ensure that each patient record has the MRT identifier to verify who performed the examination

• Comply with privacy and confidentiality legislation such as the Personal Health Information Protection Act (Ontario).

ALARA Principle

A. The potential benefits and risks of each examination should be considered. The ALARA principle (as low as reasonably achievable) principle must be applied when performing BMD examinations, the minimum number of views to produce the best examination is required. Verify that the patient is straight, has been given instructions not to move and that the beam has been aligned based on landmarks before you start your exam.

B. **Additional views** are to be taken only if the radiologist or referring physician is consulted. The reason and who was consulted must be recorded on the requisition.

X-RAY ASSOCIATES PATIENT CARE CONTACT POLICY AND PROCEDURE	ISSUING AUTHORITY Quality Advisor	EFFECTIVE DATE September 2020
LAST REVISED DATE: LAST REVIEWED DATE: Mar 23, 2024	REFERENCE	

PREAMBLE: *The term "patient" is derived from the Latin word pati—to suffer. A person becomes a patient/client because he or she seeks medical aid.*

Not all patients are suffering, but most are anxious. The anxiety may or may not be recognized by the patient. The patient may be anxious about the exam, the technologist, equipment, what might be discovered, etc. The technologist must attempt to reduce these anxieties. When a technologist greets the patient, the following is expected:

- Introduce yourself: SMILE Remember they are nervous and need to be reassured.
- Confirm that you have the correct patient, order and referring physician(s):
  You ***MUST place a √*** beside the following BEFORE starting your exam:
  - Confirm the patient's **name.**
  - Ask the patient's **DOB.**
  - Confirm that the **order is correct** and matches patient history.
  - Confirm that the correct **referring physician(s)** are getting the report.
- Explain/confirm the examination prior to starting the patient's exam. Verify the area/side requested from the requisition. (e.g. your doctor has requested an x-ray of your left hand)
- Patients privacy is a must, use a towel or paper sheet to cover exposed private areas. Provide a gown (or 2) to patients when necessary.
- Make the patient comfortable: Tell the patient how you are going to move them or how you want them to move.
- When attempting to locate a landmark, let the patient know where and why and that you will be touching them.
- Patient Contact in the sense of any procedure relates to the physical hands-on touching of a patient. Technologists are expected to follow all expectations as per their college in regards to patient contact.
- Whenever possible, a male technologist doing an examination on a female patient may request the assistance of either a relative or if necessary, a clerk. Above all, do no compromise yourself or the patient. (or female with a male patient)
- Confirm all female patients are not pregnant and record in PACS. (radiography)
- Look professional. Your appearance and attitude will bear significantly on how the patient responds.
- Always be cautious of the "at risk" patient and be prepared to respond appropriately
- Be calm and sympathetic. This is manifested in your communication techniques and body language.
- Beware of "cultural risk" areas and linguistic differences (comprehension) and be sensitive to them.

Listen to the patient. Give patients a chance to speak. Don't rush them

X-Ray Associates ***BMD Policy & Procedure Manual***	PROCEDURE: **BMD: Precision Scans**	EFFECTIVE DATE: September 2020
LAST REVISION DATE: LAST REVIEWED DATE: Sep 16, 2022, Mar 24, 2024	REFERENCE:	ISSUE AUTHORITY: Quality Advisor

Every MRT performing BMD must have completed or in the process to complete their precision scans as Data from the precision scanning will help the medical physicist determine the site's least significant change, LSC, which must be on the BMD reports.

1. Each technologist involved in BMD must carry out their own precision testing.
2. Scan repeats should be 15 patients, 3 times or 30 patients, 2 times making sure to re-position the patient by taking them on and off the table between each scan. These patients should be a good representation of the age of the population that is scanned at the site.
3. Keep track of all repeat scans for either 15 patients or 30 patients by creating a new folder within the patient directory.

4. Once all precision scanning is complete, input data into the precision calculator found on desktop.

Instructions for GE Prodigy Machine

Acquire Scan 1 for the patient -- once you are done, send the case to PACS

Close the case

Click "Directory" and double click the patient's name to open the case again

Perform Scan 2 – but do not send this case to PACS, can just close the case

Put in your BMD values for the precision study file

Scroll down the file and put in your Area values

Press "CTRL+S" to save your work

Go back to BMD program and Right Click the exam folder icon for Scan 1 and click "Send exam file to..." > "Disk"

Click "OK" twice

Repeat this for the second scan

Delete Scan 2 from database by Right clicking the exam folder icon and click "Delete"

Click "OK"

9.6 Technologist Precision – Number of Scans Required

Ideally, the scans are performed within a 30-day period and measurements must be obtained for both the PA spine and femur. The medical physicist will work with the technologist(s) to achieve accurate precision testing. Using the data obtained with these scans, the medical physicist will determine the site's least significant change.

1. Each technologist involved in BMD must carry out their own precision testing and not rely on manufacturers' precision data.

2. Scan repeats should be 15 patients, 3 times or 30 patients, 2 times making sure to ***re-position the patient by taking them on and off the table between each scan.*** These patients should be a ***good representation of the age of the population that is scanned at the applicant's site.***

Ref.: "Canadian Association of Radiologists Technical Standards for Bone Mineral Densitometry Reporting", Siminoski et al, CARJ 64 (2013) 281-294.

Note: the OAR provides a precision calculator in the resource section of the online CBMD Facility Accreditation Application.

X-Ray Associates Pediatric BMD	*PROCEDURE* ***Bone Mineral Density (BMD)***	EFFECTIVE DATE *September 2020*
LAST REVISION DATE: Mar 23, 2024 LAST REVIEWED DATE: Sep 16, 2022, Mar 23, 2024	REFERENCE	ISSUING AUTHORITY Quality Advisor

Prep: No barium studies in the last 72 hours. No Calcium tablet in the last 24 hours.

Pediatric BMD

1. Review requisition
-check patient name, DOB, name of referring doctor
-if patient is in child-bearing age, check for pregnancy

2. Complete BMD questionnaire
-If patient has history of fall, indicate how it occurred (i.e. fall on ice, fall from horse)
-Document any medication affecting bone mineral content (i.e. anti-inflammatory, hormone treatment, digestive medication-PPI)

3. Measure weight in kg

4. Measure height in cm
-Measure three times and calculate average
-If average height loss is more than 2 cm compared with previous, must indicate in comments section of BMD printout

5. Complete scan of left hip and lumbar spine by following the onscreen prompt and send results to PACS

***This exam is only completed in the Aurora location. Vaughan does not have a pediatric database.

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X-Ray Associates Routine Views	*PROCEDURE* ***Bone Mineral Density (BMD)***	EFFECTIVE DATE *September 2020*
LAST REVISION DATE: LAST REVIEWED DATE: Mar 23, 2024	REFERENCE GE Lunar BMD user manual	ISSUING AUTHORITY Quality Advisor

PREP: No barium study in last 72 hours. No Calcium pill in last 24 hours.

1. Review and complete BMD questionnaire
- If patient had history of fall, please indicate how it occurred (i.e. fall on ice, fall from horse)
- If patient had hip, forearm or L-spine replacement, please indicate why (i.e. fracture from fall or MVA)

2. Measure weight in kg

3. Measure height in cm
- Measure three times and calculate average
- If average height loss is more than 2 cm compared with previous, must indicate in comments section of the BMD printout

4. Complete appropriate scan according to the following protocol

- If no hip or L-spine replacements
  - Please scan left hip and lumbar spine
- If left hip has been replaced
  - Please scan right hip and lumbar spine
- If L-spine has been replaced
  - Please scan bilateral hips
- If L-spine and one hip have been replaced
  - Please scan nondominant forearm + non replaced hip
- If L-spine, one hip and nondominant forearm have been replaced
  - Please scan dominant forearm + non replaced hip
- If L-spine, one hip and both forearms have been replaced
  - Please scan non replaced hip + total body BMD (with skull over 20 years old)
- If L-spine and both hips have been replaced
  - Please scan 1 forearm (nondominant preferred 1st) + total body BMD (with skull over 20 years old)
- If patient exceeds table weight limit, scan both forearms

*Please do not exclude any vertebrae for the spine scan (even if standard deviation is greater than +/-1). **Always analyze the spine study from L1-L4**. This is important for consistency and precision. Only exception is if the previous report has excluded certain vertebrae, then following the same exclusion factor. (i.e if previous excluded L3, follow up scan will also exclude L3)

FEMUR ANALYSIS

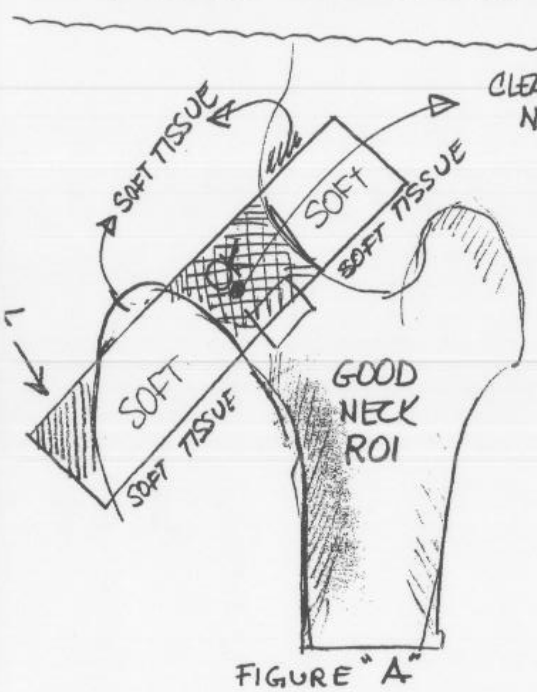


FIGURE "A"

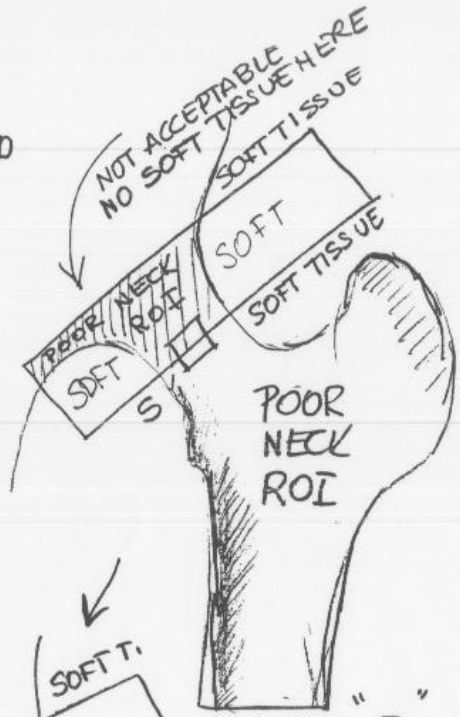


FIGURE "B"

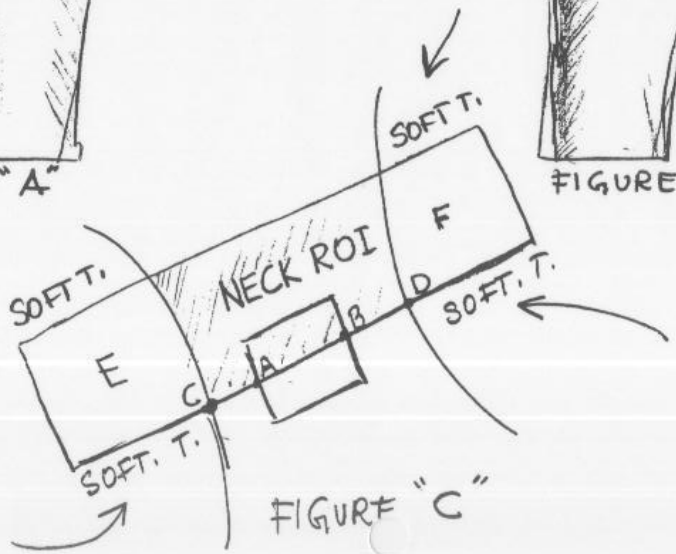


FIGURE "C"

SOME (EVEN A LITTLE) SOFT TISSUE MUST BE PRESENT IN EVERY CORNER.

IF THE AUTO ANALYSIS FAILS AND....

IF YOU DO MODIFY YOUR FEMUR..... DON'T FORGET TO PRESS F-9 AT THE END OF YOUR ANALYSIS

X-Ray Associates ***Bone Mineral Density (BMD)*** ***Policy and Procedure Manual***	*PROCEDURE* ***Bone Mineral Density*** ***MALE >50***	EFFECTIVE DATE *September 2020*
LAST REVISION DATE: LAST REVIEWED DATE: Mar 23, 2024	REFERENCE GE Lunar BMD user manual	ISSUING AUTHORITY Quality Advisor

PREP: No barium study in last 72 hours. No Calcium tablet in last 24 hours.

Fracture risk determination for Male>50 years

Policy:

When analyzing **femur for male >50 years** in age, the NHANES III white female database must be used in order to accurately determine **10-year absolute fracture risk**. **Osteoporosis category** will continue to be determined by white male database.

Procedure:

1. For each femoral measurement of male age >50 years, there will be 2 reports printed from the prodigy software.

2. First print/send to PACS femoral measurement as usual using default white male database.

3. To switch analysis to NHANES III white female database:

    i) exit out to patient directory.
    ii) Select male patient and right click with mouse. Then move cursor over to "Edit Patient"
    iii) On the patient edit screen, change gender from male to female and save/close
    iv) Open patient again for analysis. You will notice that patient gender is female now which means NHANES III white female database is being used. Print/send to PACS the analysis.

4. When complete, remember to switch patient gender back to male using the steps above.

Patient Name:
Patient Identity and Referring Physician Confirmed☐

Bone Mineral Density Patient History

Is there any chance you may be pregnant? ☐NO ☐YES ☐N/A Date of Last Menstrual Cycle: None
Have you had any X-Ray test(s) in the past five days?
☐NO ☐YES details
Have you had any previous back or hip surgery?
☐NO ☐YES details
Are you currently (within the last 6 months) taking steroid pills?
☐NO ☐YES How Long Dosage
Have you broken any bones since you turned 40?
☐NO ☐YES Which bone? What caused the fracture?
Do you take medications specifically for osteoporosis?
☐NO ☐YES describe

For Technologist Use Only:
Complete For Patients Returning for High Risk 12 Month Follow Up Exams (High Risk)
☐Prior T score less than -1 L1-L4: Total Hip:
☐Bone Loss greater than 1% per year
☐Pharmacologic drug treatment for osteoporosis (excluding calcium/vitamin D)
☐Any of the baseline high risk factors except age greater than 65 years

High Risk for Fracture or Osteoporosis:
☐Vertebral compression fracture
☐Fragility fracture after age 40
☐Family history of osteoporosis (first degree relative)
☐Systemic steroid therapy greater than 3 months duration
☐Propensity to fall
☐Malabsorption
☐Early menopause less than age 45
☐Hysterectomy ☐Full ☐Partial What age?
☐Anticovulsant therapy
☐Chemotherapy
☐Other (Indicated by referring physician)

Additional Notes:

OR 2 MINOR RISK FACTORS (required)
☐Weight less than 57 kg (126 lbs)
☐Smoking
☐Caffeine greater than 4 cups per day
☐Excessive alcohol
☐Rheumatoid arthritis
☐Low dietary calcium

Weight (kg):	Previous Height (cm): Current Height (cm): 1st) 2nd) 3rd) **Average)**
Technologist Name:	

X-Ray Associates ***Bone Mineral Density (BMD)*** ***Policy and Procedure Manual***	*PROCEDURE* TOTAL BODY COMPOSITION (Self Paid)	EFFECTIVE DATE *September 2020*
LAST REVISION DATE: Nov 14, 2020 LAST REVIEWED DATE: Mar 23, 2024	REFERENCE GE Lunar BMD user manual	ISSUING AUTHORITY Quality Advisor

PREP: No barium study in the last 72 hours or calcium tablet in the last 24 hours.

1. Review requisition. This is a self-paid exam. If a patient does not have a requisition from a physician, an X-Ray Associates requisition signed by Dr. Yeung can be used.
-check patient name, DOB, name of referring doctor
-if patient is in child-bearing age, check for pregnancy

2. If X-Ray Associates requisition is used, ensure that the Quality Advisor has signed it.

3. Change the patient into a full gown while keeping underwear on. Have the patient remove all metal and jewelry.

4. Patient Consent is required. (Use total body composition consent from next page)

5. Patients under the age of 18, require parental consent.

6. Measure height in cm and weight in kg

7. Change database to DexaMe. Start the test by going to Measure and selecting the appropriate patient from the list. Ensure the patient is centered on the table with arms positioned by the waist, but not touching any part of the body. The hands should be turned so that the thumbs are pointing to the ceiling. Follow the onscreen instruction to start the scan. Complete total body composition scan according to the enCORE scan procedure. Send results to PACS.

8. Print a copy of the results and give the patient access to their exam via the patient portal.

X-RAY ASSOCIATES Body Composition Consent Form

Patient: _ _ _ __ _ _ __ _ __ _ _ __ _ _ Date: __ _ _ __ _ _ _ _ _

Body composition measurement with Dual-energy X- ray Absorptiometry (DXA) is used increasingly for a variety of clinical and research applications. Nutrition, exercise, and aging have profound effects on fat and lean tissue. Body composition measurements in general are used for a variety of health and human performance applications.

The total body scan is fast and is completed in less than 10 minutes. The test is simple and noninvasive. You will need to simply lie still and breathe normally during the exam.

I understand that this is a non OHIP exam and that I am responsible for the fee to be paid in full before the exam.

The low dose x-ray for a total body scan is equivalent to less than one day of background radiation.

To confirm your consent, please initial the following:

___ I understand a DXA test uses low dose x-rays and I give my permission to perform such tests.

_____ I have not had a barium or nuclear medicine test in the last week.

Consent to x-ray a minor:

I am the parent or legal guardian of _ __ _ _ _ _ _ _____ _ ___ _, who is a minor,___years of age. I hereby authorize the performance of a DXA exam using low dose x-rays of the minor named above using the DXA scanner.

For females only - Regarding possibility of pregnancy:

This is to certify that, to the best of my knowledge, I am NOT pregnant. The certified staff of X-RAY ASSOCIATES have permission to perform diagnostic x-rays. I am aware that taking x-rays can be hazardous to an unborn child.

Any chance of pregnancy? Circle answer YES NO DON'T KNOW

Date of the last menstrual period?_____

Technologist:_____

Print Name:_____ Signature:_____

X-Ray Associates **Bone Mineral Density (BMD)** **Policy and Procedure Manual**	PROCEDURE DexaME	CODE/NUMBER
	ISSUING AUTHORITY Quality Advisor	PAGE
LAST REVISION DATE: Feb 05, 2019, Nov 14, 2020 LAST REVIEW DATE: Feb 05, 2019, Nov 14, 2020, Mar 23, 2024	SIGNATURE	EFFECTIVE DATE Feb 05, 2019
	REFERENCE GE Lunar BMD user manual	

DexaME Scans

1. Review requisition. It should be a requisition from the company DexaME. Please note that this is not a self-paid exam, it is paid by the company DexaME.
-check patient name, DOB, name of referring doctor
-if patient is in child-bearing age, check for pregnancy

2. Have patient sign DexaME consent form (please refer to the following page)

3. Change the patient into a full gown while keeping underwear on. Have the patient remove all metal and jewelry.

4. Measure height in cm and weight in kg

5. Change database to DexaMe. Start the test by going to Measure and selecting the appropriate patient from the list. Ensure the patient is centered on the table with arms positioned by the waist, but not touching any part of the body. The hands should be turned so that the thumbs are pointing to the ceiling. Follow the onscreen instruction to start the scan. Complete total body composition scan according to the enCORE scan procedure. Send results to PACS.

6. Upload raw image file and patient consent form using the saved link on google chrome to DEXA-Me. Password is: cxacxa2018MAY

15503-265 Port Union Road, West Hill, ON M1C 4Z7

647-499-7779 1-888-4-DEXAME fit@dexa.me www.dexa.me

DEXA Total Body Composition Consent Form

Patient Name: _____ Date: _____

Body composition measurement with Dual-energy X-ray Absorptiometry (DEXA) is used increasingly for a variety of clinical and research applications. Nutrition, exercise, and aging have profound effects on fat and lean tissue. Body composition measurements in general are used for a variety of health and human performance applications. All personal information will be kept confidential. Data will become property of DexaME and may be used for promotional purposes and quality improvement.

The total body scan is fast and is completed in less than 10 minutes. The test is simple and non-invasive.

The low dose x-ray for a total body scan is equivalent to less than THREE HOURS of background radiation. (More than 100 times less than from a Chest X-ray)

To confirm your consent, please initial the following:

___ I understand a DEXA test uses low dose x-rays and I give my permission to perform this test.

___ I have not had a barium or nuclear medicine test in the last week.

Consent to x-ray a minor:
I am the parent or legal guardian of _____, who is a minor, ____years of age. I hereby authorize the performance of a DEXA exam using low dose x-rays of the minor named above using the DEXA scanner.

For females only - Regarding possibility of pregnancy:
This is to certify that, to the best of my knowledge, I am **NOT** pregnant. The certified staff of the imaging clinic has permission to perform diagnostic x-rays.

	YES	NO	DON'T KNOW
I am pregnant			

Signed: _____ Date: _____

Measurement Procedures

Chapter 3 contents

Revised: 7/00

Obey the patient considerations that follow before you start a patient measurement:

- Clothing restrictions: Make sure the patient removes items that can attenuate the x-ray beam; such as clothing with zippers, snaps, buckles, and buttons. Ask patients to wear a jogging suit to the exam or give them an examination gown when they arrive.

- Radionuclides and radiopaque agents: Make sure the patient has not ingested or been injected with radionuclides or radiopaque agents in the past 3-5 days. If the patient has taken tests that use such agents, postpone the measurement until all traces of the element have left the patient's body. A 72-hour waiting period is usually long enough for most agents to leave the patient's body. However, consult your radiation safety officer (RSO).

- Pregnancy restrictions: If it is necessary to measure a pregnant patient, the fetus could be exposed to small amounts of radiation. Postpone the measurement until the end of pregnancy if clinical management is not affected. The decision to subject a fetus to radiation exposure must be made by the referring physician, noting that 1) bone quality for most patients does not significantly change during pregnancy and 2) in the advanced stages of pregnancy, the fetus' mineralized bone can interfere with measurements of the mother's spine and femur.

3.1 Measurement overview

There are five basic steps necessary to complete a patient measurement. These steps must be completed in the order given. Review the five steps before you start a patient measurement. Refer to section 3.2 for a step by step procedure.

3.1.1 Step 1: Record or select patient

To start a patient measurement, you must record information for a new patient or select a patient record from the database.

Record new patient information

1. Select **Measure** from the Main screen or New from the Directory tool bar. The Patient information dialog box is shown.

2. Record the necessary patient information in the three tabs that are shown on the Patient Information dialog box:

   - **Primary tab**–You must record the patient's name, birth date, height, and weight in the Primary tab to complete a measurement. The default for gender is female and the default for ethnicity is white.

   - **Secondary tab**–The Secondary tab lets you enter comments and administrative information that is not required to complete a patient measurement.

   - **Additional tab**–The Additional tab lets you record fracture, disease, and treatment information for the patient. In addition, you can also enter the patient's insurance information. This information is not required to complete a measurement.

3. Select **OK** when you have finished recording the patient information. The New Measurement screen is shown.

Select existing patient record

Select a patient for a new measurement from either the Main screen or the Directory screen. Use the Search option (section 1.4.2) to find the patient, if necessary.

Main screen

1. Select **Measure**. The Patient Information dialog box is shown.

2. Select **Find**. The Patient and Image lists are shown.

3. Double-click on the patient in the Patient list. The Patient Information dialog box is shown.

4. Make sure the patient information is correct, then select **OK**. The New Measurement screen is shown.

Instructions for BMD scan

Password: PRODIGY

- Turn on computer
- Lunar DICOM + DICOM Queue should show at the bottom
- double click prodigy
- single click quality assurance + proceed
- return to main manue, click measure + worklist appears
- patient's name once registered should appear on list
- if not click new patient type in, in capital letters
  - primary page: first name
    - last name
    - patient ID (it is the patient's ID # from requisition . i.e 000RS)
    - physician
    - DOB
    - height
    - weight
    - male or female
  - Secondary in address
    - put in height of sponge (small, medium or high)
    - in facility ID, put in initials of scanner
    - exam ID, put in RS000-accession #
    - click okay
- measure screen shows up, pick body art, it will be highlighted in black
- click position
- click start
- when scan is completed save and close
- returns to patient list, double click patient name + pick hip scan
- when scan is complete save and close
- returns to patient list screen, at bottom of screen, click on top scan and drag down to second warning appears click okay
- are you sure question appears, click okay
- Now both scans are in one folder
- double click on folder and scan appears, click reposit
- make sure AP spine (L1-L4), Left femur, printer + DICOM are all click on
- hit okay
- images will print and go to pacs

Directory screen

Double-click on the patient in the Patient list, or highlight the patient and select **Measure** from the Common tool bar. The New Measurement screen is shown.

3.1.2 Step 2: Select measurement site

The New Measurement screen shows a skeletal image that gives the sites you can select to measure. Use the mouse to click on the site you want to measure. The site you select is highlighted in the Site(s) list and the applicable mode for the site is highlighted in the Mode(s) list.

Information about the measurement modes is located in the *Safety Information and Technical Specifications* manual you received with your system.

3.1.3 Step 3: Position patient

AP Spine, Femur, DualFemur, and Total Body position

1. Make sure all attenuating materials (belts, metal buttons, etc.) are removed from the measurement region. For Total Body scans, all materials that may cause significant attenuation must be removed.

2. Help the patient onto the scanner table, and position the patient as follows (figure 3-1):

   1 the patient's hands are flat with the palms down on the scanner table and arms are alongside the patient's body.

   2 the patient's body is in the center of the scanner table—use the centerline on the table as a reference to align the patient.

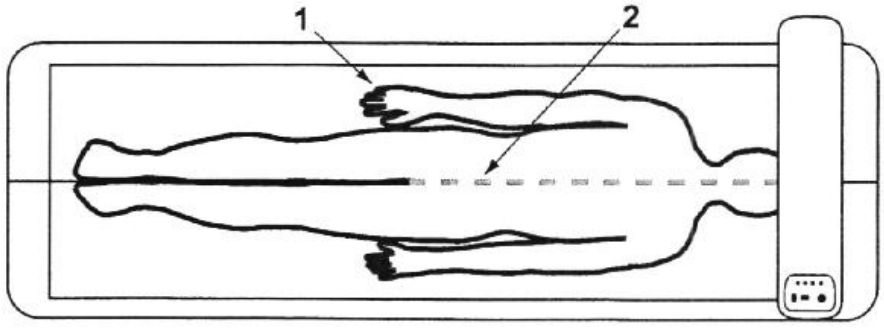


Figure 3-1. Basic patient position

3. Select **Position** from the New Measurement tool bar. The scanner arm moves to the approximate start position.

4. A graphic is shown which gives the correct patient position, and measurement start position, for the site you are measuring. Use the graphics and the basic techniques that follow to position the patient for a specific measurement site:

   - **AP Spine**–Use the support block to elevate the patient's legs. Make sure the patient's thighs form a 60°–90° angle with the table top. This step helps separate vertebrae and flatten the lower back.

   - **Femur and DualFemur**–Use the centerline on the scanner table as a reference to make sure the foot brace is centered. A clear plastic strip on the bottom of the foot brace lets you view the centerline. Internally rotate the patient's legs and secure the patient's feet to the foot brace (do not remove the patient's shoes).

   - **Total Body**–Remove the patient's shoes. Make sure the patient's head is approximately 3 cm below the horizontal line on the table pad. Use the velcro straps to secure the patient's knees and feet to prevent movement during the measurement.

Forearm position

1. Put the forearm positioner (figure 3-3) on top of the pad against the front edge of the scanner table. The LUNAR logo should be located near the patient's fingers.

2. Seat the patient in a chair next to the scan table (figure 3-2).

   NOTE: Use a chair without arms or wheels. Use the same chair for all forearm measurements to get optimal precision.

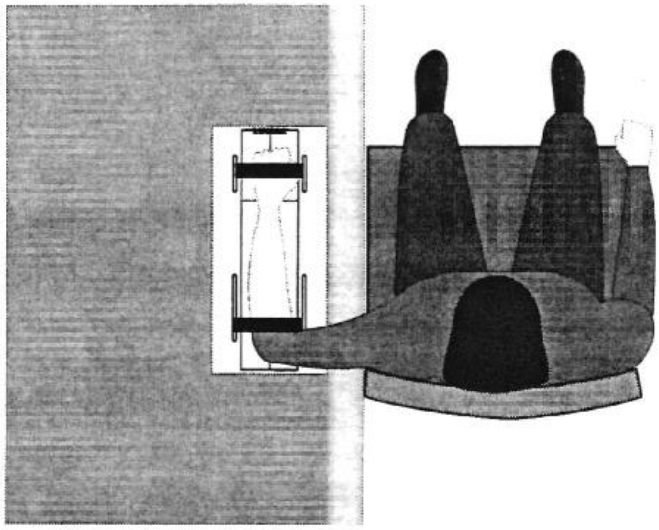


Figure 3-2. Forearm position

3. Tell the patient to make a loose fist, and position the forearm so that it is centered between the black lines on the positioner. Align the distal end of the ulna with the blue line on the positioner.

4. Attach the velcro straps over the fist and over the arm immediately below the elbow. The straps must be outside the measurement region.

5. Slide the positioner and the patient's forearm along the edge of the table until the patient's elbow makes a 90-degree angle.

6. Select **Position** from the New Measurement tool bar.

Forearm positioner

The forearm positioner keeps the patient's forearm from moving during a measurement.

1 Put the positioner on top of the pad on the table so that the LUNAR logo is located near the patient's fingers.

2 The red line shows the center of the measurement area. Center the patient's forearm along this line.

3 The black lines show the boundary of the measurement area. Position the patient's forearm so that both the radius and ulna are between these lines.

4 The blue line shows the starting point of the measurement. Position the patient's forearm so the distal end of the ulna is at this line. Also, position the laser light at this line when you start a measurement.

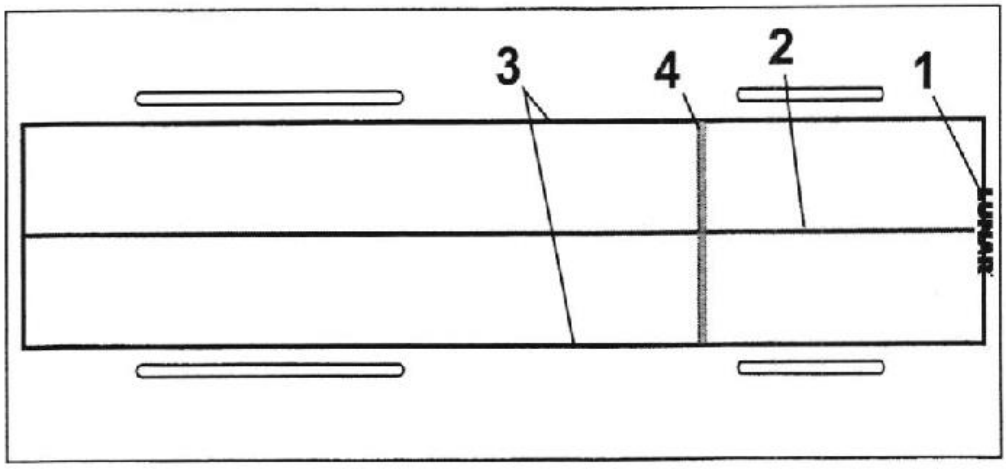


Figure 3-3. Forearm positioner

- **Forearm**–position the laser light at the blue line on the forearm positioner and in the center of the patient's arm.
- **LVA/Lateral spine**–position the laser light at the top of the patient's iliac crest.

NOTE: You are not required to adjust the laser light for Total Body measurements.

WARNING: Each Lunar scanner is equipped with a Class II Laser that is less than 1 milliwatt in strength. **DO NOT STARE INTO THE BEAM.**

3.1.5 Step 5: Start measurement

After you have completed steps 1 through 4 above, select **Start** from the New Measurement tool bar to start the measurement. Monitor the image to make sure it is correct.

Monitor AP Spine image

Make sure the spine is in the center of the image. The image must start in L5 (**1**) and end in T12 (**2**) (figure 3-7).

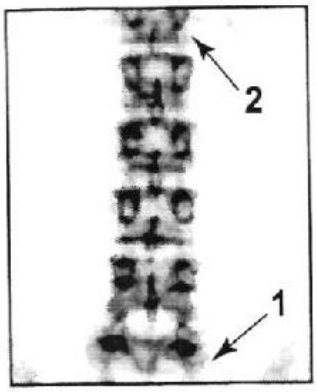


Figure 3-7. Correct AP Spine image

Monitor Femur image

A correct Femur image shows the greater trochanter (**1**), femoral neck (**2**), and ischium (**3**) (figure 3-8). A minimum of three centimeters of tissue should be show above the greater trochanter and below the ischium.

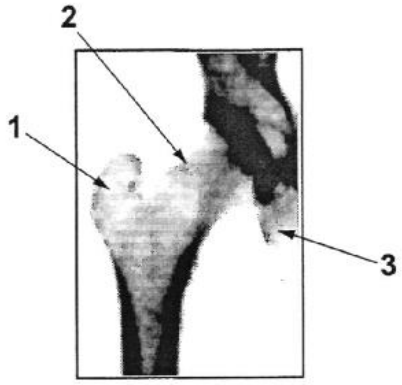


Figure 3-8. Correct Femur image

DualFemur

After the program has measured the left femur, the scan arm moves to the approximate start position for the right femur. Check the start position and, if necessary, adjust the measurement start position for the right femur.

Monitor Total Body image

A correct Total Body image shows the patient's entire body. Make sure the head, fe and the patient's arms are shown in the image (figure 3-9).

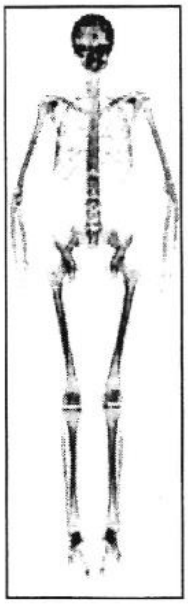


Figure 3-9. Correct Total Body image

Monitor Forearm image

Make sure the forearm is in the center of the image and the distal end of the ulna is shown near the top of the image (1 in figure 3-10).

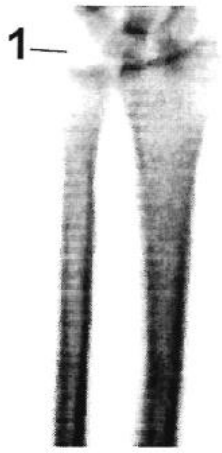


Figure 3-10. Correct forearm image

Monitor LVA/Lateral spine image

Make sure the image is correct (figure 3-11).

1 The image starts near the top of the iliac crest.

2 At least 2.5 cm of soft tissue is shown on the anterior side of the vertebrae.

3 The image ends in L1 for a Lumbar measurement or near T4 for an LVA measurement.

4 All of the posterior elements appear in the image.

5 The edge of the positioner may appear in the image. This is not a problem.

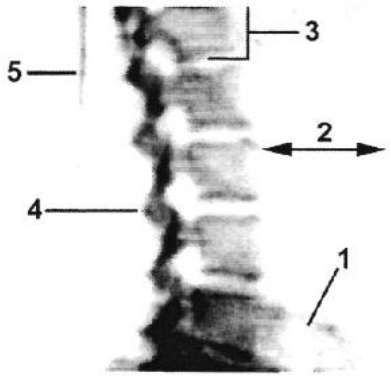


Figure 3-11. Correct lateral spine image

Total body analysis

This section gives information to complete a standard analysis of a Total Body image. **AT ALL TIMES,** let the program perform the analysis unless the scan image obviously must be corrected.

4.5.1 Total body analysis tools

Table 4-4. Total body analysis tools.

Icon	Tool	Description
	**Move Vertex**	This tool is shown when you select **ROIs**. Select the Move Vertex tool if it is necessary to position ROI vertices. Refer to section 4.5.2.

4.5.2 Total body analysis procedure

Both the bone and soft tissue images are shown when you open a total body image for analysis. Changes you make to the cut positions on one image are also made on the other image. You can turn off the dual image option in the User Options **Image** tab.

1. Select an image file for analysis (refer to section 4.1.1).
2. Select **Imaging** and adjust the image if necessary (refer to section 4.1.2).
3. Make sure the cuts are positioned as follows (figure 4-8):

    1 **Head**–The Head cut is located immediately below the chin.

    2 **Left and right arm**–Both arm cuts pass through the arm sockets and are as close to the body as possible. Ensure the cuts separate the hands and arms from the body.

    3 **Left and right forearm**–Both forearm cuts are as close to the body as possible and separate the elbows and forearms from the body.

    4 **Left and right spine**–Both spine cuts are as close to the spine as possible without including the rib cage.

    5 **Left and right pelvis**–Both pelvis cuts pass through the femoral necks and do not touch the pelvis.

    6 **Pelvis top**–The Pelvis Top cut is immediately above the top of the pelvis.

    7 **Left and right leg**–Both leg cuts separate the hands and forearms from the legs.

    8 **Center leg**–The Center Leg cut separates the right and left leg.

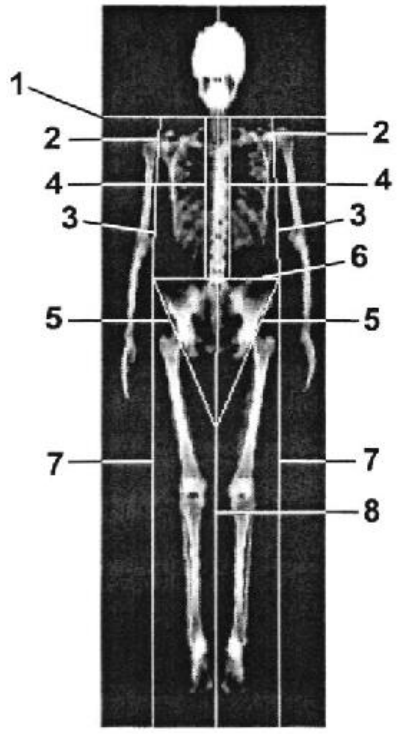


Figure 4-8. Locations of cuts

4. Is it necessary to adjust cut positions?

   - *If yes,* select **ROIs** and continue to step 5.
   - *If no,* continue to step 6.

5. Select the Move Vertex tool. Adjust the cut itself or select a vertex to adjust the cut position:

   - **Vertex**–Use the left mouse button to click on a vertex, then drag the cursor (the cursor is shown as a circle to indicate the vertex is selected).
   - **Cut**–Use the left mouse button to click on a cut (not a vertex), then drag the cursor.

6. Select **Results** to view the analysis results.

7. Select **Save** to save your changes or select **Close** then **No** if you do not want to save your changes.

   NOTE: Refer to section 4.10 to create Reference results or Trending results.

FEMUR ANALYSIS

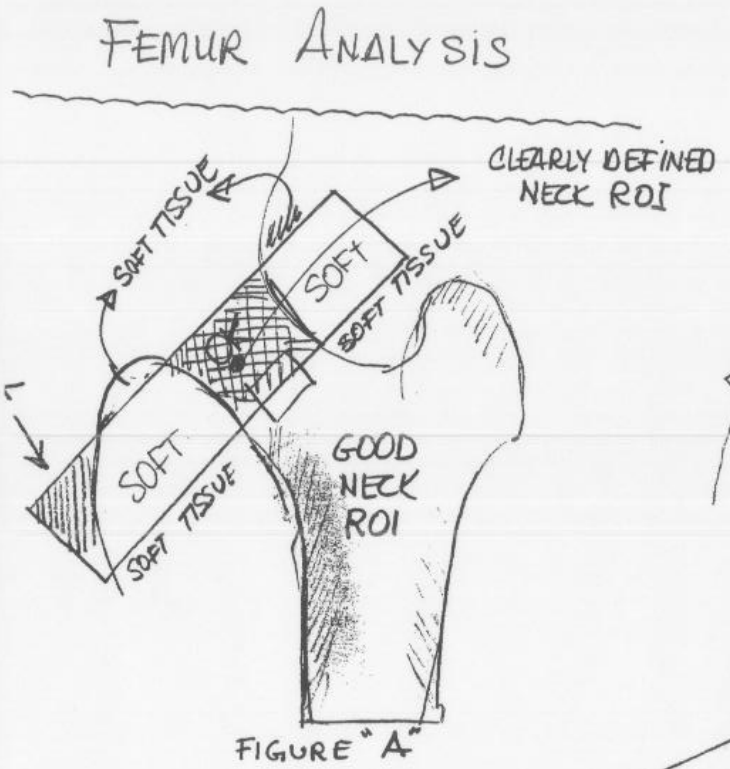


FIGURE "A"

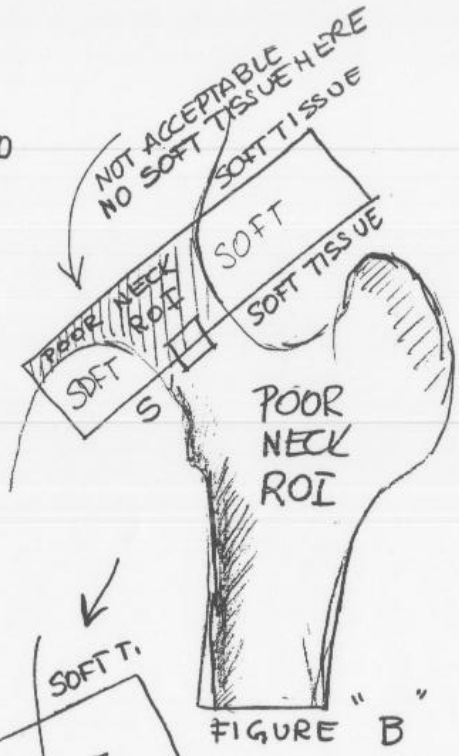


FIGURE "B"

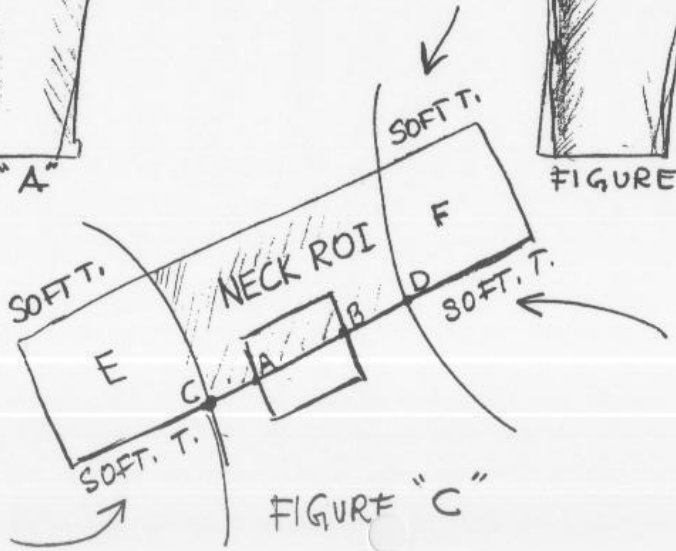


FIGURE "C"

SOME (EVEN A LITTLE) SOFT TISSUE MUST BE PRESENT IN EVERY CORNER.

IF THE AUTO ANALYSIS FAILS AND....

IF YOU DO MODIFY YOUR FEMUR..... DON'T FORGET TO PRESS F-9 AT THE END OF YOUR ANALYSIS

X-RAY ASSOCIATES BMD POLICY & PROCEDURE MANUAL	PROCEDURE QUALITY ASSURANCE	EFFECTIVE DATE: September 2020
LAST REVISION DATE: LAST REVIEWED DATE: Mar 23, 2024	ISSUING AUTHORITY Quality Advisor	Reference:

QA Protocol

Daily Quality Assurance procedure

This procedure calibrates and verifies functionality, as well as accuracy and precision of the densitometer.

Complete Quality Assurance procedures on each clinical day. Make sure each QA procedure passes. Refer to chapter 2 of the enCORE Operator's Manual.

If your system does not pass a test, check the position of the calibration block and complete the Quality Assurance procedure again. If the procedure fails a second time, call service support- X-Tron Imaging. DO NOT scan patients.

Daily Spine Phantom scan and Shewhart's Chart

1. Perform a phantom scan on each clinical day using the encapsulated spine phantom.

2. Under patient directory, search for "phantom" under patient's last name. Select "phantom" and proceed to scan encapsulated spine phantom using default spine scan protocol.

3. Once scan is complete, check the ROI placement and readjust appropriately:

L1 2.5cm +/- 0.2cm
L2 3.0cm +/-0.2cm
L3 3.5cm +/-0.2cm
L4 4.0cm +/-0.2cm

4. Input BMD and area data into Shewhart's chart spreadsheet found on desktop

5. Check that both BMD and area readings have passed the Shewhart's rules. If either BMD or area reading fails, repeat phantom scan or recheck ROI placement observing the rules above.

6. Do not scan patients unless Shewhart's Chart passes. Call service support- Xtron Imaging if Shewhart's chart does not pass after repeat scans and/or readjusting ROIs fail.

2 Quality Assurance (QA)

Revised: 12/99

Complete a Quality Assurance (QA) test each morning before you measure a patient. This procedure assures quality measurements are obtained. **Save all QA printouts.**

Use the black calibration block to complete a QA test (the calibration block consists of tissue-equivalent material with three bone-simulating chambers of known bone mineral content).

Leave the pad on the scanner table during the QA procedure.

1. Select **Quality Assurance** from the Main screen or from the Common tool bar. The Quality Assurance screen is shown.
2. Select **Start**. A message is shown instructing you to position the calibration block.
3. Put the calibration block on the pad so that the laser light shines in the center of the cross-hair label on the calibration block (**1** in figure 2-1).

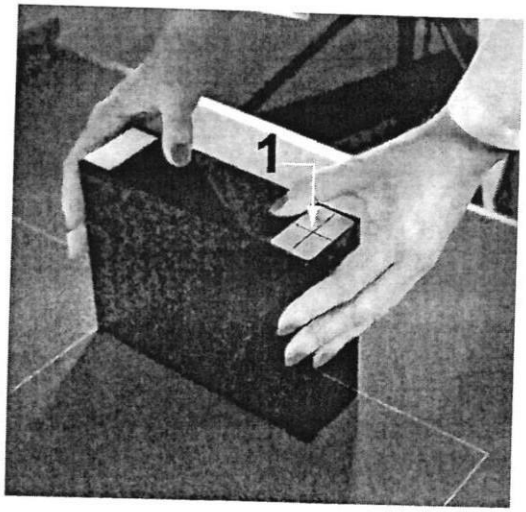


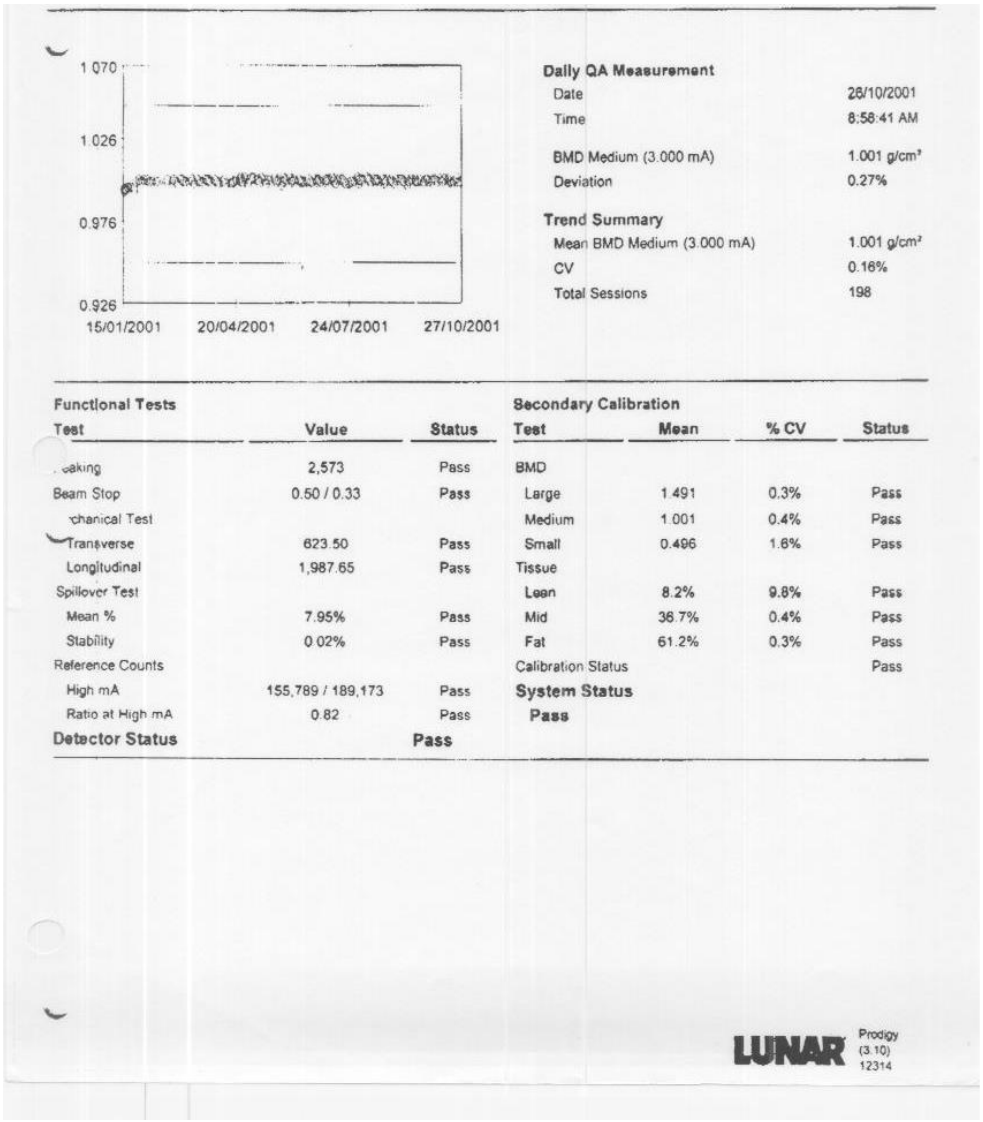
Figure 2-1. Calibration block position

4. Select **OK**. Follow the screen prompts to complete the QA procedure.

5. Make sure the Detector Status and System Status have passed as shown on the Quality Assurance screen.

   If the QA test did not pass, reposition the calibration block and repeat the procedure. If the procedure fails a second time, call Lunar Support for assistance.

6. Select **Report** to create the QA results. **Save the QA printout**.



Daily QA Measurement

Date	28/10/2001
Time	8:58:41 AM
BMD Medium (3.000 mA)	1.001 g/cm²
Deviation	0.27%

Trend Summary

Mean BMD Medium (3.000 mA)	1.001 g/cm²
CV	0.16%
Total Sessions	198

Functional Tests

Test	Value	Status
Soaking	2,573	Pass
Beam Stop	0.50 / 0.33	Pass
Mechanical Test		
Transverse	623.50	Pass
Longitudinal	1,987.65	Pass
Spillover Test		
Mean %	7.95%	Pass
Stability	0.02%	Pass
Reference Counts		
High mA	155,789 / 189,173	Pass
Ratio at High mA	0.82	Pass
Detector Status		**Pass**

Secondary Calibration

Test	Mean	% CV	Status
BMD			
Large	1.491	0.3%	Pass
Medium	1.001	0.4%	Pass
Small	0.496	1.6%	Pass
Tissue			
Lean	8.2%	9.8%	Pass
Mid	36.7%	0.4%	Pass
Fat	61.2%	0.3%	Pass
Calibration Status			Pass
System Status			
Pass			

LUNAR Prodigy (3.10) 12314

X-Ray Associates ***Bone Mineral Density (BMD)*** ***Policy and Procedure Manual***	*PROCEDURE* ***Bone Mineral Density*** ***PEER REVIEW***	EFFECTIVE DATE *September 2020*
LAST REVISION DATE: LAST REVIEWED DATE: Mar 23, 2024	REFERENCE	ISSUING AUTHORITY Quality Advisor

TECHNOLOGIST PEER REVIEW:

At least annually image audits and live observation are done on all MRTs performing BMD.
5 exams should be reviewed for image quality and 1 live observation done.
Any issues identified should be followed up immediately and if necessary, an additional review(s) done.

BONE MINERAL DENSITOMETRY - IMAGE REVIEW FORM

Record the required information in the boxes below and use the `Comments Section' to elaborate.

Facility Name/IHF No.

	Patient 1	Patient 2	Patient 3
Patient Identifier (Exam #, Patient Initials)			
Examination Date			
Examination Clinically Indicated			
Final report include: Deformities if present			
Absolute bone density values			
"T" score			
Relative fracture risk			
Significance of change from previous & baseline			
Recommendations for further assessment (if applicable)			
Image Quality - Diagnostic/Non-diagnostic			
Are the Tech sheets (questionnaires) completed and signed?			
Is pregnancy documented?			
Is there proper positioning for the views provided?			
Does the interpretive report format meet the CAR standards with respect to Procedures and Materials, Findings, Limitations, Clinical issues, Comparative Data, Assessment and Recommendations			
Record **interpreting physician's** name			
Record **imaging technologist's** name			

Comments: ***If there are any deficiencies noted, please provide comment in the IMAGE REVIEW section of the Assessment Report.***

Patient 1	
Patient 2	
Patient 3	

BONE MINERAL DENISTY

MEDICAL RADIATION TECHNOLOGIST OBSERVATION FORM

Please complete one form for each examination observed

MRT OBSERVED:	
CMRTO #:	

PATIENT IDENTIFIER:	
PATIENT WRITTEN CONSENT OBTAINED:	

	C	NC	NA
1.8.1 DUTIES AND RESPONSIBILITIES OF MRTs			
Ensure appropriate delegations (when required).	○	○	○
Follow facility policy regarding situations where the use of chaperones may be appropriate.	○	○	○
Ensure the room is prepared for the procedure specified in the order.	○	○	○
Select and set up the equipment and materials needed for the procedure specified in the order. (patient height and weight taken and documented)	○	○	○
Ensure correct patient identification (e.g. confirmation of patient name, date of birth, examination to be performed, and physician/authorized health professional authorization is present).	○	○	○
Confirm that the order is appropriate based on the patient history (ie. Baseline vs. High Risk).	○	○	○
Ensure female patients are confirmed and documented – "Not Pregnant"?	○	○	○
Inquire about and record any contraindications (e.g. barium studies) before starting the exam.	○	○	○
Ensure that the worklist contains the correct patient information (if applicable).	○	○	○
Obtain informed consent (oral or written as per facility policy) before each examination (after explaining the procedure and answering any questions).	○	○	○

	C	NC	NA
Ensure pertinent clinical history is available and supplement as necessary.	○	○	○
Instruct the patient to remove only the clothing and items that will interfere with the procedure, providing the patient with a gown or sheet to cover areas where clothing was removed and explaining to the patient when and where the MRT may touch them and why.	○	○	○
Follow the facility examination protocols.	○	○	○
Ensure BMD Patient Questionnaire is completed.	○	○	○
Follow facility protocols when unexpected findings are found that would require immediate attention (e.g. fracture seen.)	○	○	○
THROUGHOUT THE EXAMINATION:			
Assess the patient's condition before, during and after the procedure or course of treatment and make modifications to procedures based on the patient's physical, medical and/or emotional status and needs.	○	○	○
Maintain patient comfort, privacy and dignity at all times.	○	○	○
Stop procedure if at any time the patient withdraws consent and record withdrawal of consent and reason as per site protocol.	○	○	○
Use radiation protection devices and other patient protection devices, as required, and record.	○	○	○
Use PPE (personal protection equipment masks/gloves/gown etc.) as required for the procedure and as indicated by personal risk assessment.	○	○	○
Was the data from previous scans compared to the current exam? (if applicable). If so, was a "trend" demonstrated on the findings?	○	○	○
Ensure that the orientation of the body and other pertinent parameters are marked correctly on the image and data.	○	○	○
Ensure the processed image provides diagnostic image quality while using minimal radiation (ALARA – As Low As Reasonably Achievable). Take corrective action if necessary and record explanation of sub-optimal imaging.	○	○	○
Do all technologists have an up-to-date precision study? (No older than 5 years).	○	○	○
Perform quality control procedures as per facility policies?			
○ Shewhart testing on each clinical day of operation. (daily phantom testing)	○	○	○
○ Is documentation available	○	○	○
Ensure the door to the examination room is self-closing, marked with a radiation warning symbol and closed during radiation exposures.	○	○	○
Ensure that patient examination images and data contains patient name, ID number, date of examination and type of examination.	○	○	○
Ensure that each patient record has the MRT identifier to verify who performed the examination.	○	○	○

	C	NC	NA
Were infection control procedures followed? (e.g. table covered with paper, hand washing/sanitizer used before and after touching patient etc.)	○	○	○
Comply with privacy and confidentiality legislation such as the Personal Health Information Protection Act (Ontario). Was patient privacy maintained at all times?	○	○	○
IMAGE REVIEW:			
Are the images diagnostic and include 2 sites?	○	○	○
Ensure correct anatomy is displayed on image for accuracy of positioning			
○ Ensure proper positioning of scan (spine and femur)?	○	○	○
○ Ensure appropriate region placement (spine and femur)?	○	○	○
○ Ensure vertebrae are correctly numbered?	○	○	○

General Comments: *(Please use this section to provide overall comments regarding the technologist's performance, attitude, competency etc. Is the facility an OAR accredited site? What infection control measures were taken? Document products used?*

INFECTION CONTROL PROTOCOL

Use hand Sanitizer or wash hands between patient

Use Accel or Caviwipes for cleaning the bed

Use fresh table paper to cover the pillow and table for each patient

Keyboard and computer desk should be wiped at the beginning and or end of each shift with a damp cloth.

Wipes chairs with Cavi or Accel wipes after each patient use. Don't forget the legs of the chair at least weekly.

IPAC UPDATES 2019

Single Use Items: All items marked as single use, cannot be reused under ANY circumstances.

Supply Storage:

No supplies can be stored under sinks. This area is damp and may cause contamination.

New Equipment:

ALL equipment must be inspected by the General Manager and/or Lead Technologist and/or IT before use. Ultrasound probes must be cleaned according to manufacturer guidelines before use. TV probes must be reprocessed before use.

Equipment Inspection:

All equipment should be inspected on a regular basis. TV probes after each use. ANY concerns must be brought to the Lead Technologist and General Manager immediately. The equipment MUST be removed from use immediately.

Equipment Recalls:

Any notification of an equipment recall from a manufacturer must be reported to the General Manager. All actions must be followed as per notice.

Patient Exam Rooms, Front Reception:

Only a drink that has a lid may be in these areas. Eating, storage of food, smoking, application of cosmetics or lip balm and handling contact lenses is NOT permitted in these area.

X-Ray Associates ***Bone Mineral Density (BMD)*** ***Policy and Procedure Manual***	*PROCEDURE* ***Bone Mineral Density*** ***Hand Washing/PPE***	EFFECTIVE DATE *September 2020*
LAST REVISION DATE: LAST REVIEWED DATE:Mar 23, 2024	REFERENCE	ISSUING AUTHORITY Quality Advisor

General Hand Hygiene:

- Keep nails short
- Remove all jewelry
- Do not use artificial nails
- Make sure sleeves are rolled up and do not get wet during washing

When should you wash your hands?

- BEFORE and AFTER patient exam
- Before eating food
- After using the washroom
- After blowing nose, coughing or sneezing
- After touching garbage
- After removing gloves

**** WHEN IN DOUBT WASH YOUR HANDS OR USE ABHR

ALCOHOL-BASED HAND RUB (ABHR) with 70- 90% alcohol (check expiry date)

ABHR is the first choice for hand hygiene when hands are not visibly soiled. ABHR is less time consuming to use than washing with soap and water and is the most time-effective protocol for routine patient care.

ABHR is the preferred method for decontaminating hands, when hands are not visibly soiled. Using ABHR is more effective than washing hands (even with an antibacterial soap) when hands are not visibly soiled.

TECHNIQUE FOR USING ABHR:

The following procedure should be used for cleaning hands with ABHR:

· Ensure hands are visibly clean (if soiled, follow hand washing steps) and dry.

· Apply one pump of product onto one palm; the volume should be such that 15 seconds of rubbing is required for drying.

· Spread product over all surfaces of hands, concentrating on finger tips, between fingers, back of hands, and base of thumbs; these are the most commonly missed areas.

· Continue rubbing hands until the product is dry. This will take a minimum of 15 seconds if sufficient product is used. Hands must be fully dry before touching the patient, the environment, or equipment for the ABHR to be effective.

The physical actions of scrubbing with soap and water and rinsing are important for effective removal of material from the hands. It has been shown that at least 15 seconds of lathering with soap is required to remove transient flora.

TECHNIQUE FOR HAND WASHING

The following procedure should be used for hand washing:
· Wet hands with warm (not hot or cold) water; hot or cold water is hard on the hands, and will lead to dryness.
· Apply liquid or foam soap.
· Vigorously lather all surfaces of hands for a minimum of 15 seconds. Pay particular attention to finger tips, between fingers, backs of hands and base of the thumbs; these are the most commonly missed areas.
· Using a rubbing motion, thoroughly rinse soap from hands; residual soap can lead to dryness and cracking of skin.
· Dry hands thoroughly by blotting hands gently with a paper towel; rubbing vigorously with paper towels can damage the skin.
· Turn off taps with paper towel, to avoid recontamination of the hands

Personal Protective Equipment

Gloves, masks, gowns and eye-protection must be used where and when necessary to protect both patient and personnel. Reasonable care for infection control must be exercised for all patients.

Gloves must be worn for all examinations where there may be any infection risk or where an endocavity probe is used.

In the event of a respiratory disease outbreak (SARS, H1N1, etc.), staff will be provided with the necessary personal protective equipment.

Sequence for Donning PPE:

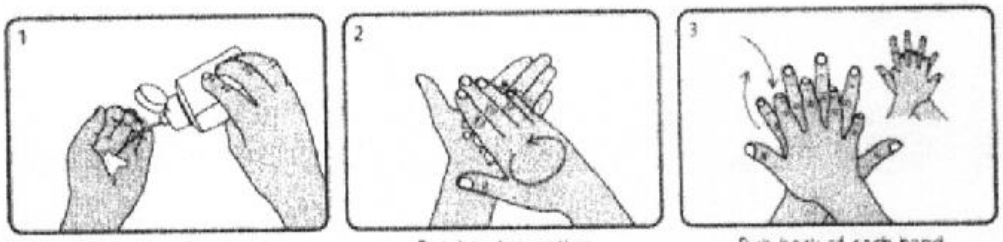
- Perform Hand Hygiene
- Put on gown
- Put on Mask
- Put on eye protection
- Put on gloves

Sequence for Removal of PPE:

Remove gloves
Remove gown
Perform Hand Hygiene
Remove Eye Protection
Remove Mask
Perform Hand Hygiene

NHS

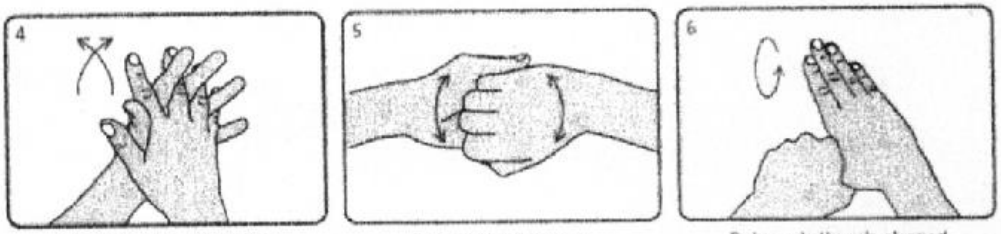
Alcohol handrub hand hygiene technique – for visibly clean hands



1 Apply a small amount (about 3 ml) of the product in a cupped hand

2 Rub hands together palm to palm, spreading the handrub over the hands

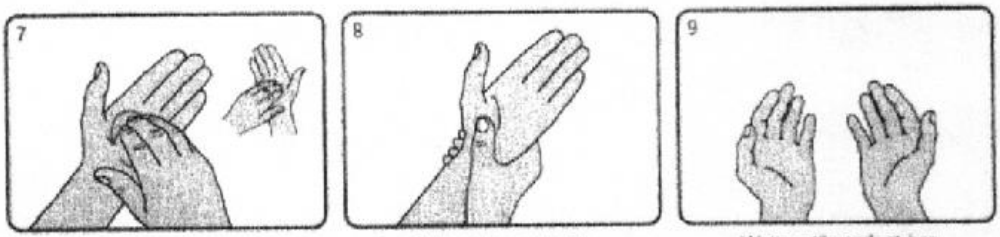
3 Rub back of each hand with palm of other hand with fingers interlaced



4 Rub palm to palm with fingers interlaced

5 Rub back of fingers to opposing palms with fingers interlocked

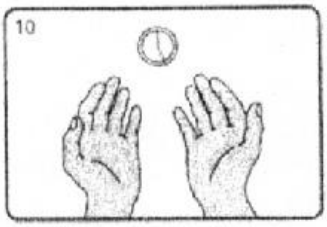
6 Rub each thumb clasped in opposite hand using a rotational movement



7 Rub tips of fingers in opposite palm in a circular motion

8 Rub each wrist with opposite hand

9 Wait until product has evaporated and hands are dry (do not use paper towels)



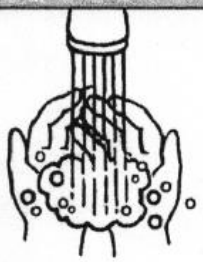
10 The process should take 15–30 seconds

cleanyourhands campaign

NHS National Patient Safety Agency

Adapted from World Health Organization Guidelines on Hand Hygiene in Health Care

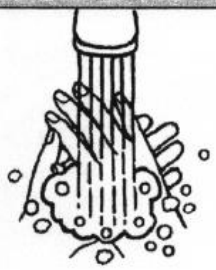
Hand Washing



1. Wet hands.

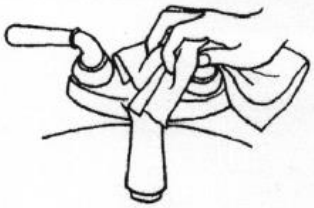
2. Apply soap.

3. Lather for 15 seconds. Rub between fingers, back of hands, fingertips, under nails.



4. Rinse well under running water.

5. Dry hands well with paper towel or hot air blower.



6. Turn taps off with paper towel, if available.

Stop the Spread of Germs

Always Wash Your Hands

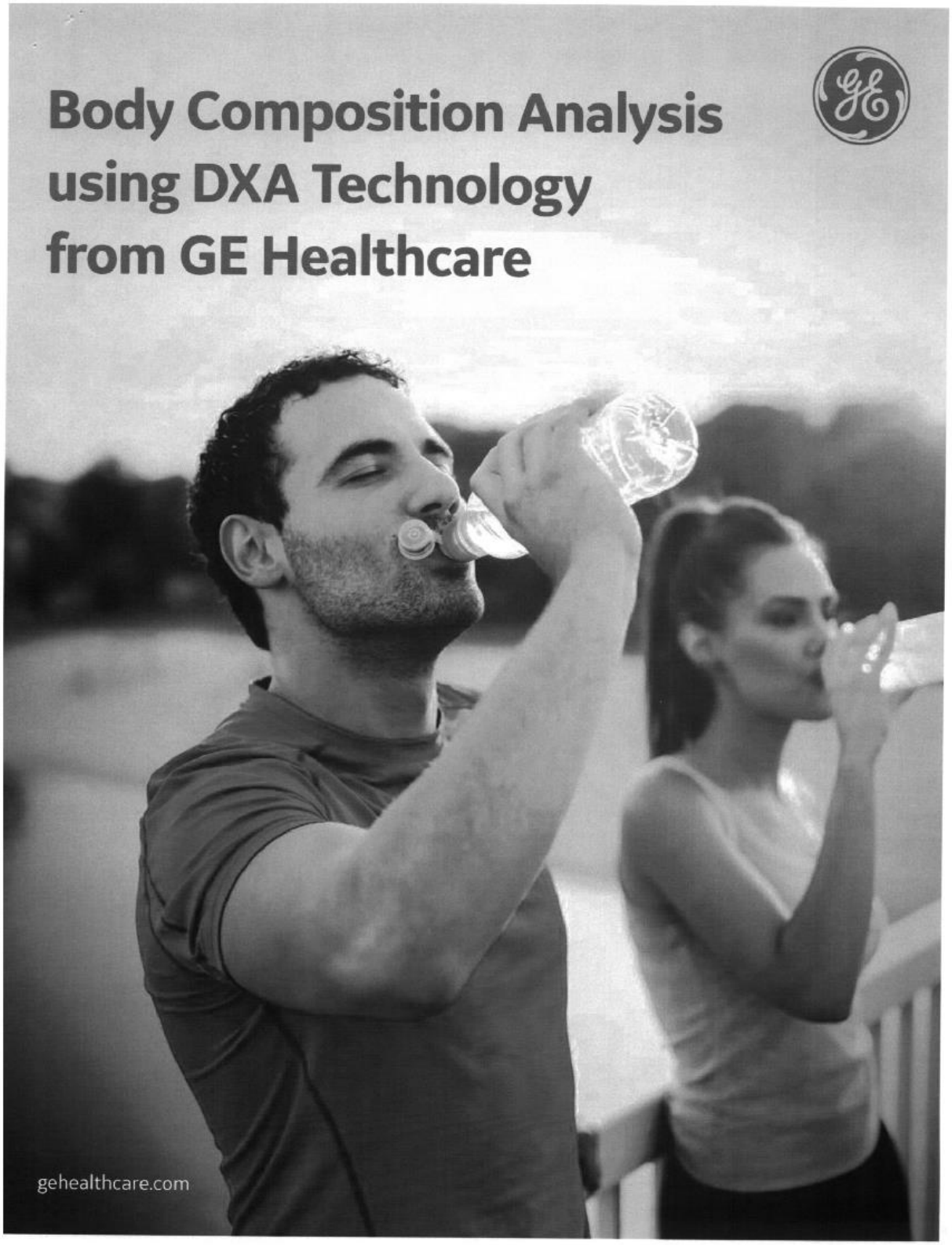
After you:

- Sneeze, cough or blow your nose
- Use the washroom or change diapers
- Handle garbage
- Play outdoors

Before and after you:

- Prepare or eat food
- Touch a cut or open sore

416.338.7600 toronto.ca/health | TORONTO Public Health


Body Composition Analysis
using DXA Technology
from GE Healthcare
gehealthcare.com

Fat matters...
where matters more.

Looking beyond the bathroom scale

Accurate measurement of body composition provides valuable information for assessing, monitoring and treating a variety of diseases and disorders.

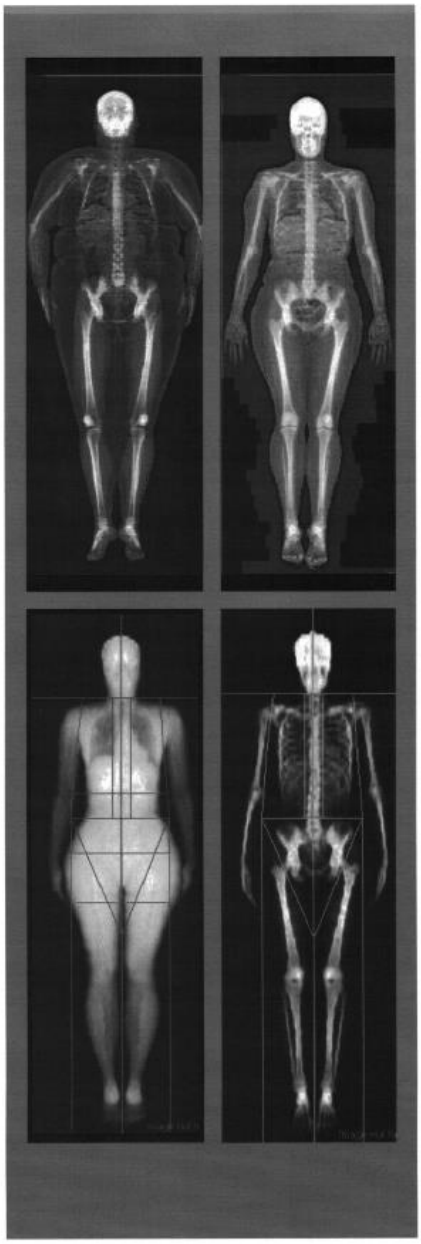
Most people are used to stepping on a scale before every visit to a doctor's examining room. But monitoring patients' weight – while helpful – is at best a crude and imprecise way to assess their health. Today's body composition measurement tools provide far more complete and precise information that can help support diagnoses and guide treatment. They can even help athletes make decisions on the training regimens they use to achieve the best performance.

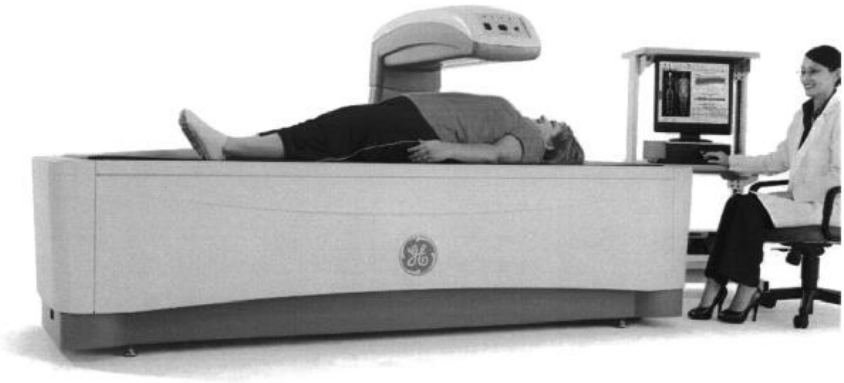
Body composition measurement with dual-energy X-ray absorptiometry (DXA) can look beyond weight and the traditional body mass index (BMI) to determine body fat distribution – an important risk factor in a variety of serious diseases. More broadly speaking, information from DXA exams can prove valuable in conditions, such as:

- Obesity
- Anorexia nervosa
- Cystic fibrosis
- Wasting syndrome (caused by HIV/Aids)
- Chronic renal failure

In all these cases, body composition measurement contributes to a thorough patient evaluation and helps physicians monitor the effects of therapy, diet or exercise.

Body composition scans with DXA provide precise and accurate data on bone and tissue composition, including bone mineral density (BMD), lean tissue mass, and fat tissue mass. They provide both total body data and regional results (trunk, arms, legs, pelvis and android/gynoid regions). The measurements are fast and non invasive.





Clinical obesity

Obesity is linked to many debilitating and life-threatening disorders. Body mass index gives a simple anthropometric measurement of obesity, but data shows that the regional distribution of excess body fat is an important independent risk factor.[1]

Those at greatest risk are now thought to be those with central obesity – high levels of upper body (abdominal) fat.[2]

- Worldwide obesity has more than doubled since 1980
- More than 1.9 billion adults, 18 years and older, are overweight. Of these, over 600 million are obese[13]

Important clues for managing eating disorders

Assessment of body composition is important in evaluating and managing severe eating disorders such as anorexia. It is well known that women with anorexia nervosa more easily develop osteoporosis.[5]

Patients with anorexia lose a substantial amount of lean tissue, accounting for from 15% to 45% of the loss of total body mass. Much of this loss in lean tissue is muscle. Physicians treating anorexia use body composition with DXA to:

a) evaluate disease severity by setting target values of lean and fat

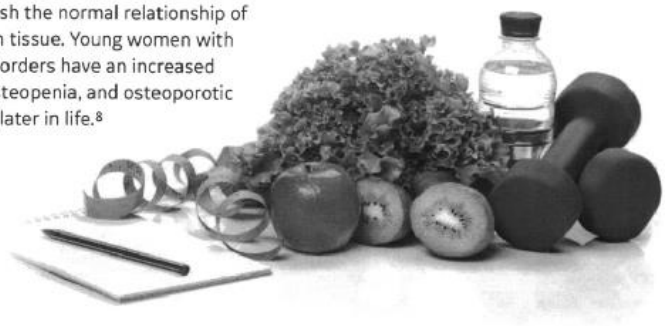
b) monitor changes in both lean and fat compartments

c) measure the effectiveness of nutritional interventions.[7]

As one study found, "A key advantage of DXA is that changes in bone mineral density, fat and lean mass can be monitored. Weight scale measures general weight change, but without specific differentiation of changes in fat and lean mass for the total body or in various regions of interest."[8]

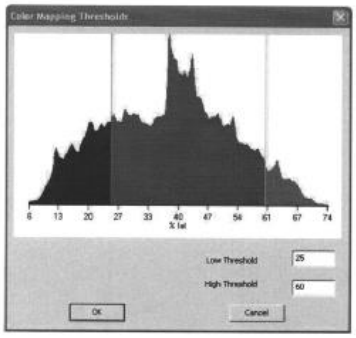
Nutritional therapies must not only increase fat tissue, but must also re-establish the normal relationship of fat to lean tissue. Young women with eating disorders have an increased risk for osteopenia, and osteoporotic fractures later in life.[8]

Studies show that change in whole body lean-tissue mass correlates strongly with change in body weight after hemodialysis. Renal failure also affects the skeletal constitution: Patients with renal dysfunctions are at significantly higher risk of primary and secondary osteoporosis.[9]

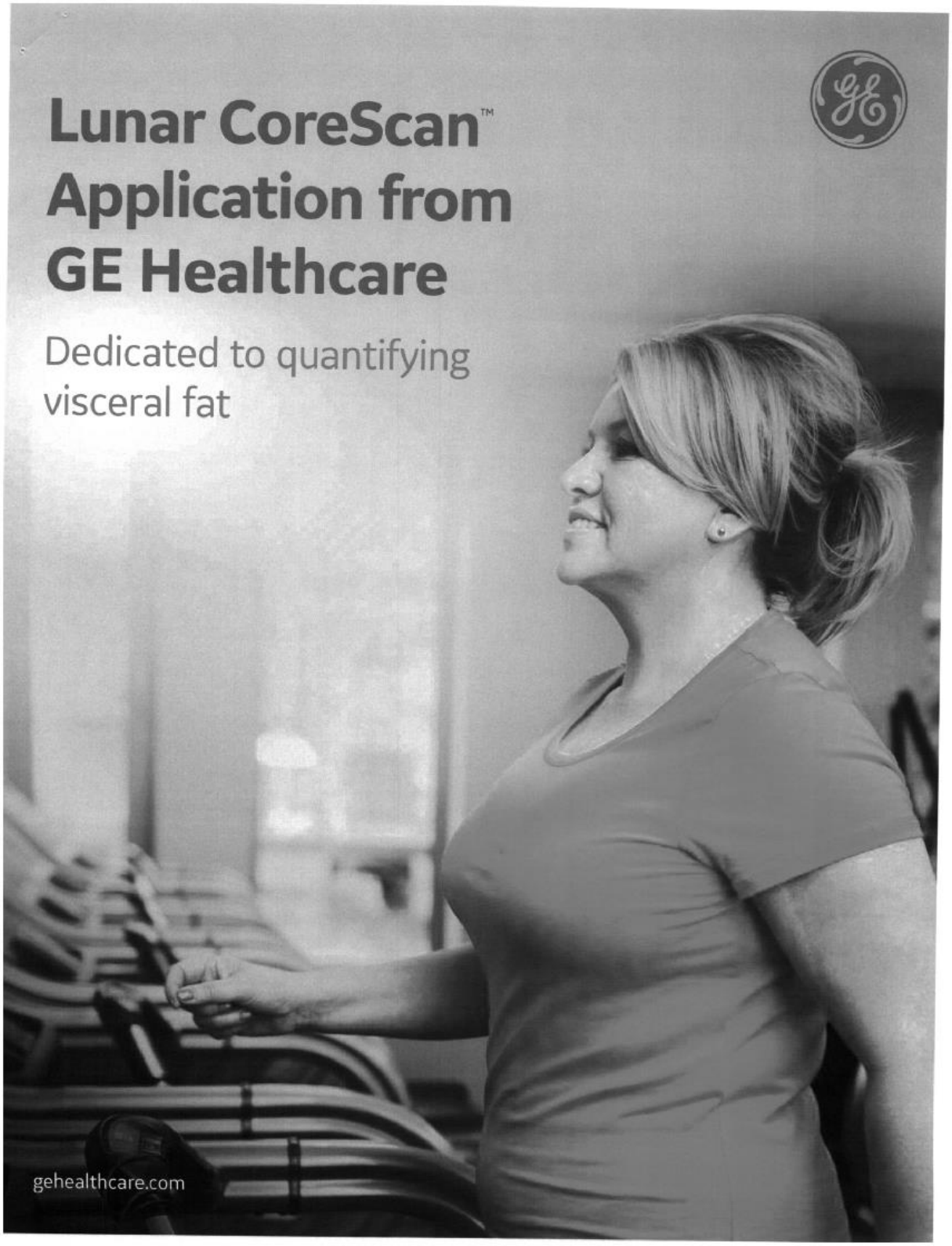


AIDS/HIV

Wasting syndrome, defined as weight less than 90% of ideal body weight, is a devastating disease and a consequence of HIV infections.[10] Accurate determination of body composition with DXA has value in assessing the extent of gender-specific muscle wasting and fat loss. The information can be used to monitor the effects of pharmacological and nutritional programs aimed at preventing or treating wasting syndrome of AIDS/HIV.[10]

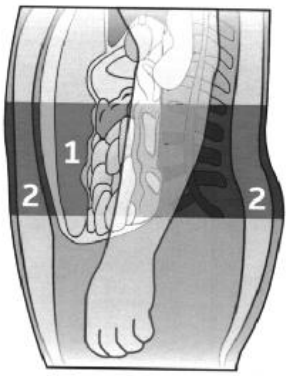


User-adjustable %fat threshold: To visualize high % fat regions.


Lunar CoreScan™
Application from
GE Healthcare
Dedicated to quantifying
visceral fat
gehealthcare.com

The need for knowledge

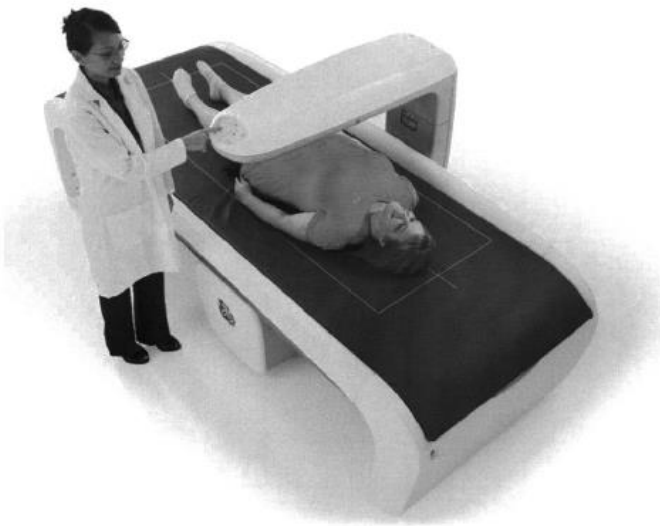
Today, there's an urgent need to know more about the links between visceral adipose tissue (VAT), obesity, and the metabolic diseases affecting millions worldwide. That requires credible VAT measurement data. **Accurate**. **Reproducible**. **Practical**.

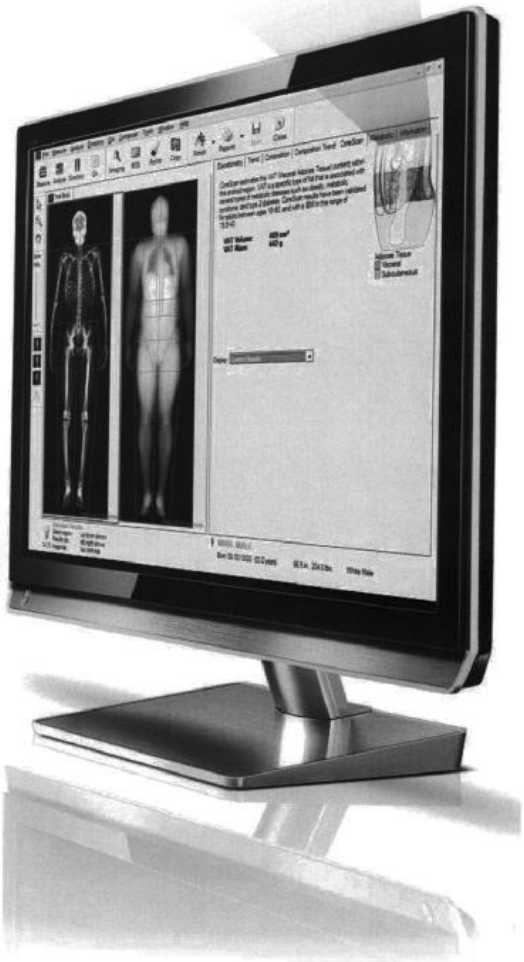


1 Visceral Tissue
2 Subcutaneous Tissue

CoreScan

Available on Prodigy and Lunar iDXA platforms, CoreScan software is the first application to quantify VAT using DXA technology – giving you a more in-depth view of body composition. CoreScan helps you advance clinical knowledge and improve disease assessment and management. And lead the way to a healthier, more vital future.





Accurate

CoreScan software measures up

The CoreScan application features an exclusive GE Healthcare algorithm that uses data from the Lunar iDXA™ and Prodigy™ body composition systems. Accuracy just got easier—with a validated data system you can trust.

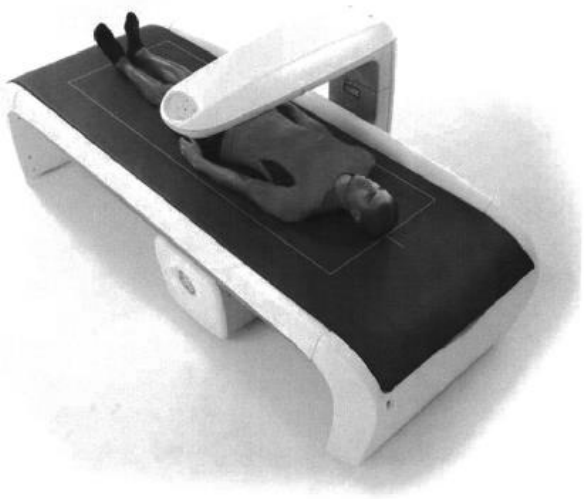
- Excellent correlation with CT, as shown in a study at Oregon Health & Science University[1]
- Distinction between VAT and subcutaneous fat, using geometric calculations and attenuation measurements

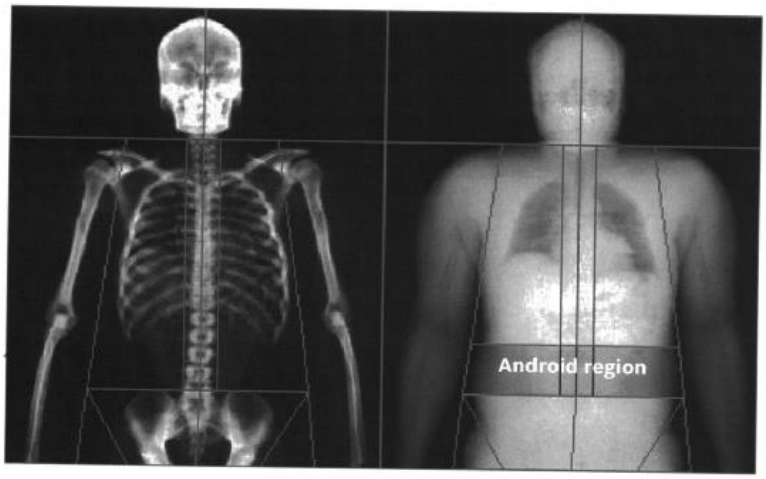
Reproducible

A higher standard

Leading the way to successful research and treatment begins with credible data: reproducible results from a validated method. CoreScan software sets a higher standard for VAT measurement. It can help you predict patient risk, assess treatment approaches, and compare patients within your practice or study.

- Standardized region of measurement uses individual patient skeletal measurements to determine the region
- The android region (below the rib cage) is typically where VAT deposits accumulate, making it highly relevant for measuring VAT
- CoreScan automatically defines the android region on each patient, designed to avoid variance between clinicians, machines, or research sites





CoreScan software provides a detailed view of the android region's composition – taking you well beyond alternative crude measures. Developed by GE Healthcare, android region measurement provides accessible, clinically validated data to support research and treatment of obesity-related conditions.

CMRITO
Regulator of medical radiation and imaging technologists in Ontario

TABLE OF CONTENTS

CMRITO STANDARDS OF PRACTISE

Introduction

The Standards of Practice have been developed by the College of Medical Radiation and Imaging Technologists of Ontario[1] (CMRITO or the "College") to describe the expectations for professional practice of members of the College. The Standards of Practice describe what each member is accountable and responsible for in practice. They represent performance criteria for members and can be used to interpret the scope of practice to the public and other health care professionals.

In the Standards of Practice, "members" refers to all members of the CMRITO; that is, members in all of the five specialties: radiography, radiation therapy, nuclear medicine, magnetic resonance and diagnostic medical sonography. In the Standards of Practice, "profession" refers to the profession of medical radiation and imaging technology, which includes all of the five specialties: radiography, radiation therapy, nuclear medicine, magnetic resonance and diagnostic medical sonography.

The Standards of Practice reflect the knowledge, skills and judgement that members need in order to perform the services and procedures that fall within the scope of practice of the profession.

The *Regulated Health Professions Act* and the companion health profession Acts govern the practice of regulated health professions in Ontario. For this profession, the companion Act is the *Medical Radiation and Imaging Technology Act* (MRIT Act). The *Medical Radiation and Imaging Technology Act* sets out the scope of practice statement for the profession, as follows:

" The practice of medical radiation and imaging technology is the use of ionizing radiation, electromagnetism, soundwaves and other prescribed forms of energy for the purposes of diagnostic or therapeutic procedures, the evaluation of images and data relating to the procedures and the assessment of an individual before, during and after the procedures."

The *Medical Radiation and Imaging Technology Act* also sets out which of the controlled acts as set out in the *Regulated Health Professions Act*, members are authorized to perform. These are known as authorized acts. The *Medical Radiation and Imaging Technology Act* states:

[1] On January 1, 2020, the *Medical Radiation and Imaging Technology Act, 2017* (MRIT Act) came into force. The MRIT Act changed the name of the College of Medical Radiation Technologists of Ontario to the College of Medical Radiation and Imaging Technologists of Ontario, and the name of the profession to the medical radiation and imaging technology profession. **2**

" In the course of engaging in the practice of medical radiation and imaging technology, a member is authorized, subject to the terms, conditions and limitations imposed on their certificate of registration, to perform the following:

1. Administering substances by injection or inhalation.

2. Tracheal suctioning of a tracheostomy.

3. Administering contrast media, or putting an instrument, hand or finger,

• Beyond the opening of the urethra,
• Beyond the labia majora,
• Beyond the anal verge, or
• Into an artificial opening of the body.

4. Performing a procedure on tissue below the dermis.

5. Applying a prescribed form of energy."

The Standards of Practice are intended to be generic. The indicators that follow each Practice Standard indicate the application of the Practice Standard in a specific dimension of practice. Most indicators refer to tasks that are common to all members. Indicators that refer to tasks generally performed only by members in one of the specialties are listed under separate headings. The methods for implementing each task may be determined by departmental policies and procedures.

In the event that the Standards of Practice set a standard that is higher than departmental policy or procedure, the member must comply with the standard set by the Standards of Practice. In the Standards of Practice, the term "legislation" refers to both statutes and regulations.

Under the College's Standards of Practice, members of the College are expected to be:

Competent: meaning to have the necessary knowledge, skills and judgement to perform safely, effectively and ethically and to apply that knowledge, skill and judgement to ensure safe, effective and ethical outcomes for the patient. This means that members must maintain competence in their current area of practice, must refrain from acting if not competent, and must take appropriate action to address the situation.

Accountable: meaning to take responsibility for decisions and actions, including those undertaken independently and those undertaken as a member of a team. This means that members must accept the consequences of their decisions and actions and act on the basis of what they, in their clinical judgement, believe is in the best interests of the patient. **3**

Collaborative: meaning to work with other members of the health care team to achieve the best possible outcomes for the patient. This means members are responsible for communicating and coordinating care provision with other members of the health care team, and taking appropriate action to address gaps and differences in judgement about care provision.

Members must take appropriate action if they feel these interests are being unnecessarily and unacceptably compromised. This includes not implementing ordered procedures or treatment plans that, from their perspective, appear to be contraindicated, and in this event, taking appropriate action to address the situation.

1. Legislation, standards and ethics

In order to be registered as a member of the College of Medical Radiation and Imaging Technologists of Ontario, members must meet the professional education and other registration requirements set by the College. They must continue to educate themselves about practical, legal, ethical and other matters pertaining to the profession. Members must be competent, accountable and collaborative in their practice.

Practice Standard: Members must understand, and adhere to, the legislation governing the practice of the profession, the Standards of Practice set by the College, the Code of Ethics and the by-laws of the College.

Indicators

Members must:

a. have the knowledge, skills and judgement to perform procedures undertaken in the course of the practice of the profession

b. take responsibility for decisions and actions, including those undertaken independently and those undertaken as a member of the team

c. work with other members of the health care team to achieve the best possible outcomes for the patient

d. adhere to all relevant provincial and federal legislation and guidelines governing the practice of the profession

e. adhere to the Standards of Practice set by the College

f. adhere to the Code of Ethics and the by-laws of the College[4]

g. adhere to all regulations made under the *Medical Radiation and Imaging Technology Act* including:

• Quality Assurance
• Registration
• Professional Misconduct
• Advertising

2. Equipment and materials

The practice of members entails the use of a wide range of equi pment and materials. Members must know and understand the functions, capabilities, specifications and hazards of the equipment and materials they use in the course o f their practice.

Practice Standard: Members must have the knowledge, skills and judgement to select the appropriate equipment and materials for procedures ordered by a physician or other authorized health professional, to make determinations as to the quality, serviceability and operability of the equipment and materials, and to take any corrective actions required to meet standards set by legislation, facility policies and manufacturers' guidelines. Members must be skilled in making safe, efficient and effective use of resources to produce the desired examination information or deliver safe, effective treatment.

Indicators

Members must:

a. ensure the room is prepared for the procedure specified in the o order

b. select and set up the equipment and materials needed for the pr ocedure specified in the order

c. select the correct substances to be administered orally, by injection or inhalation, or into the body through an orifice

d. prepare diagnostic or therapeutic substances as required

e. conduct the required quality control tests, or ensure that the required quality control tests have been conducted, on each piece of equipment and any m aterials used in the ordered procedure, according to the applicable legislation and the facility policies and manufacturers' guidelines**5**

f. ensure that the results of quality control tests are acceptable

g. if quality control tests are not within acceptable limits, take corrective action to ensure that the standards set by legislation, facility policies and manufacturers' guidelines are met

h. determine the quality, serviceability, and operability of the equipment and materials to be used in the procedure in accordance with the standards set by legislation, facility policies and manufacturers' guidelines, and if the standards are not met, take corrective action

i. determine, set and verify the technique and protocol to be used in the procedure

j. verify all required immobilization and/or beam modification devices

k. make use of appropriate shielding devices

In addition, members in the specialty of radiation therapy must:

l. prepare or construct immobilization or personalized devices and/or beam modification devices as required

In addition, members in the specialty of magnetic resonance must:

m. administer and follow the necessary safety precautions for entry to the magnet room

In addition, members in the specialty of nuclear medicine and radiation therapy must:

n. dispose of expired, unused or contaminated eluate, radioactive materials and all administrative devices in accordance with legislation and established safety protocols

o. store radiopharmaceuticals and radioactive materials according to manufacturers' specifications

In addition, members in the specialty of diagnostic medical sonography must:

p. clean and/or reprocess transducers, or ensure that transducers are cleaned and/or reprocessed after each patient use in accordance with the manufacturers' guidelines, other applicable guidelines and the facility policies

q. use, store and dispose of ultrasound gel and gel containers in accordance with applicable guidelines and the facility policies **6**

3. Diagnostic and therapeutic procedures

Members employ ionizing radiation, radiopharmaceuticals, electromagnetism and soundwaves to create images and data that are part of diagnostic imaging e xaminations or that are used for defining and recording treatment parameters. These images may be dynamic, on film, digital displays, three-dimensional models or templates. Members in the specialties of radiation therapy and nuclear medicine administer ionizing radiation to treat cancer and other diseases.

Members who apply ionizing radiation do so under the authority of and in accordance with the *Healing Arts Radiation Protection Act* and, where applicable, the *Nuclear Safety and Control Act* and their respective regulations. Members are permitted to apply electromagnetism for magnetic resonance imaging under an exemption set out in the Controlled Acts regulation made under the *Regulated Health Professions Act*. Members are also permitted to apply soundwaves for diagnostic ultrasound under an exemption set out in the Controlled Acts regulation made under the *Regulated Health Professions Act*.

Members perform five controlled acts, which they are authorized to perform under the *Medical Radiation and Imaging Technology Act*. These are:

1. administering substances by injection or inhalation;
2. tracheal suctioning of a tracheostomy;
3. administering contrast media or putting an instrument, hand or finger,
• beyond the opening of the urethra,
• beyond the labia majora,
• beyond the anal verge, or
• into an artificial opening of the body;
4. performing a procedure on tissue below the dermis; and
5. applying a prescribed form of energy.

Practice Standard: Members must be able to create images and data that are suffici ently accurate and clear for the diagnostic or therapeutic procedures that are ordered by a physician or other authorized health professional. In the case of procedures that use ionizing radiation, members use only the minimum amount of radiation necessary during the course of the procedure. Members performing procedures using soundwaves for diagnostic ultrasound use the minimum acoustic power output and minimum exposure time. Members must be proficient in evaluating the images, data and tests relating to the procedures to ensure that the images, data and tests are satisfactory.**7**

Members must be able to administer ionizing radiation, radiopharmaceuticals, electromagnetism for magnetic resonance imaging and soundwaves for diagnostic ultrasound accurately and in accordance with the order of the physician or other authorized health professional for the diagnostic or therapeutic procedure and the applicable legislation. Members must not apply or administer ionizing radiation or radiopharmaceuticals unless the conditions under the applicable legislation (including without limitation, the *Healing Arts Radiation Protection Act* and its regulations and the *Nuclear Safety and Control Act*, its regulations and licences issued thereunder) have been met.

Under the *Medical Radiation and Imaging Technology Act*, members are authorized to perform five controlled acts ("authorized acts") as required in the course of engaging in the practice of the profession. They must not perform the authorized acts or any exempted controlled act unless the conditions under the *Regulated Health Professions Act*, the *Medical Radiation and Imaging Technology Act* and their respective regulations, and the Standards of Practice have been met.

Indicators

Members must:

a. perform procedures involving the application or administration of ionizing radiation only when the conditions under the applicable legislation have been met (This includes, without limitation, the *Healing Arts Radiation Protection Act* and its regulations and the *Nuclear Safety and Control Act*, its regulations and licences issued thereunder.)

b. perform only those controlled acts that have been authorized or exempted or excepted under the legislation or delegated in accordance with the legislation and the Standards of Practice[2]

c. perform authorized acts or delegated or exempted controlled acts only when the conditions under the legislation and the Standards of Practice have been met

d. ensure that the appropriate order authorizing the performance of the procedure is in place:

1. for application of ionizing radiation: the order must be from a physician or other authorized health professional listed in the *Healing Arts Radiation Protection Act* or regulations

[2] Members may accept delegation of other procedures that are controlled acts under the *Regulated Health Professions Act* and not authorized to members under the *Medical Radiation and Imaging Technology Act* provided they comply with the *Regulated Health Professions Act* and the Standards of Practice as set out in Practice Standard 6, Professional relationships.**8**

2. for nuclear medicine procedures: the order must be from a person authorized under the regulations made under the *Public Hospitals Act* or in accordance with the generally accepted professional standards established under the *Independent Health Facilities Act*

3. for application of electromagnetism for magnetic resonance imaging procedures: the order must be from a physician or another authorized health professional listed in the Controlled Acts regulation made under the *Regulated Health Professions Act*, and in accordance with that regulation

4. for application of soundwaves for diagnostic ultrasound procedures: the order must be from a physician or another authorized health professional listed in the Controlled Acts regulation made under the *Regulated Health Professions Act*, and in accordance with that regulation

5. for authorized acts (other than the application of electromagnetism for magnetic resonance imaging procedures or the application of soundwaves for diagnostic ultrasound procedures): the order must be from a physician

e. perform procedures, including authorized acts, only in the course of engaging in the practice of the profession

f. not perform procedures contrary to any terms, conditions or limitations placed upon the member's certificate of registration

g. have and apply the necessary knowledge, skills and judgement to perform and manage the outcomes of performing the procedure safely, effectively and ethically

h. ensure that patient consent has been obtained

i. be responsible and accountable for performing the procedure and managing the outcomes having considered:

1. the known risks to the patient in performing the procedure

2. the predictability of the outcomes in performing the procedure

3. whether the management of the possible outcomes is within the member's knowledge, skill and judgement given the situation

4. any other factors specific to the situation to ensure the procedure is implemented safely, effectively and ethically[9]

j. not perform any procedure or provide any advice which may result in serious bodily harm unless that procedure or advice is within the scope of practice of the profession or the member is authorized or permitted to do so by legislation

k. position the patient as required for the diagnostic or therapeutic procedure

l. ensure the area to be diagnosed or treated will be displayed on the resultant image or captured electronically

m. use radiation protection devices and other patient protection devices as required

n. instruct the patient on breathing and movement procedures

o. ensure that the orientation of the body and other pertinent parameters are marked correctly on the images and data

p. ensure the exposure provides optimum image quality while using minimal radiation

q. ensure examination results (images and data) provide all the information requested in the order

r. carry out the procedures ordered

s. assess the patient's condition before, during and after the procedure or course of treatment

t. respond to any change in the patient's condition during or after the procedure or course of treatment

u. complete the procedure, advise the patient of any post-procedural care, and transfer the care of, or release, the patient

In addition, members in the specialty of radiography, nuclear medicine, magnetic resonance and diagnostic medical sonography must:

v. determine if the images and/or data are of sufficient diagnostic quality or if additional or repeat images are necessary

In addition, members in the specialty of magnetic resonance must:

w. perform procedures involving the application of electromagnetism for magnetic resonance imaging only when the conditions under the *Regulated Health Professions Act*, the *Medical Radiation and Imaging Technology Act* and their respective regulations have been met**10**

In addition, members in the specialty of diagnostic medical sonography must:

x. perform procedures involving the application of soundwaves for diagnostic ultrasound only when the conditions under the *Regulated Health Professions Act*, the *Medical Radiation and Imaging Technology Act* and their respective regulations have been met

y. use the minimum acoustic power output and minimum exposure time to obtain the optimum image quality and the necessary clinical information

In addition, members in the specialty of radiation therapy must:

z. develop and/or interpret a treatment plan for each patient

aa. calculate treatment doses and duration of administration

bb. ensure use of record and verification systems

cc. identify the treatment field and treatment volumes

dd. determine if the image verifies treatment parameters or if a repeat image is necessary

ee. assess and match the treatment verification image with the reference image and make required adjustments to patient position

ff. select and/or verify treatment parameters

gg. administer treatment

4. Safe practice

Members operate equipment, apply ionizing radiation, electromagnetism for magnetic resonance imaging and soundwaves for diagnostic ultrasound, and administer radiopharmaceuticals. All of these could be dangerous if used incorrectly. Members endeavour, at all times and in every aspect of their practice, to reduce the risk of harm to their patients, to themselves, to their colleagues and to any other individuals who may be present in the practice environment.

Practice Standard: Members must have and maintain the knowledge, skills and judgement to practise safely by adhering to all relevant provincial and federal legislation and guidelines, departmental protocols and policies and manufacturers' directions pertaining to health and safety. In the event of any unexpected problems or emergencies, members must be competent and prepared to handle or to assist in the management of the situation.**11**

Indicators

Members must:

a. observe all departmental and facility policies and relevant provincial and federal legislation and guidelines pertaining to health and safety, such as:

1. *Regulated Health Professions Act* and its regulations

2. *Medical Radiation and Imaging Technology Act* and its regulations

3. *Public Hospitals Act* and its regulations

4. *Independent Health Facilities Act* and its regulations

5. *Healing Arts Radiation Protection Act* and its regulations

6. *Occupational Health and Safety Act* and its regulations

7. *Nuclear Safety and Control Act* and its regulations and licences issued thereunder

8. *Radiation Emitting Devices Act* and its regulations

9. *Transportation of Dangerous Goods Act* and its regulations

10. *Health Protection and Promotion Act* and its regulations

11. Health Canada's Technical Reports and Publications, including:

• Safety Code 20A – X-Ray Equipment in Medical Diagnosis Part A: Recommended Safety Procedures for Installation and Use, 1980

• Safety Code 26 – Guidelines on Exposure to Electromagnetic Fields from Magnetic Resonance Clinical Systems, 1987

• Safety Code 30 – Radiation Protection in Dentistry, 1999

• Safety Code 35 – Safety Procedures for the Installation, Use and Control of X-ray Equipment in Large Medical Radiological Facilities, 2008

• Safety Code 36 – Radiation Protection and Quality Standards in Mammography - Safety Procedures for the Installation, Use and Control of Mammographic X-ray Equipment, 2013**12**

12. As Low As Reasonably Achievable (ALARA) principle

b. conduct the appropriate quality control tests, or ensure that the appropriate quality control tests have been conducted, for all equipment and substances to be used in the diagnostic or therapeutic procedure

c. take corrective action if quality control tests are not within acceptable limits

d. use substances only before their expiry time or date

e. verify the patient's identity for all diagnostic or therapeutic procedures

f. prior to performing the procedure, ascertain whether there are any contraindications to the procedure, including pregnancy for procedures involving ionizing radiation, and notify the patient's physician, authorized health professional, radiologist, nuclear medicine physician, cardiologist or radiation oncologist of any contraindications and obtain direction to proceed, modify or halt the procedure

g. prior to administering a substance orally, by injection or inhalation, or into the body through an orifice, ascertain whether there are any contraindications to administering the substance to the patient and make necessary explanations, or referrals or implement necessary restrictions

h. assess the patient's physical and emotional limitations and ensure that the patient will not be expected to perform any task or movement that would cause ph ysical harm

i. take all reasonable precautions to ensure that no equipment can injure a patient

j. use the ALARA principle to minimize patient exposure to radiation and soundwaves for the procedure

k. use shielding/protective devices where indicated

l. initiate emergency response procedures, notify a physician (if possible) and assist in, or carry out, emergency treatment as required if a patient suffers any adverse reaction to treatment or to administered substances

m. use appropriate aseptic techniques and infection control procedures in the course of the diagnostic or therapeutic procedure

n. protect themselves, their colleagues, other members of the health care team, any other individuals who may be present as well as any patient from any unnecessary exposure to radiation[13]

o. ensure all positioning aids and immobilization devices maintain the patient's position appropriate to the diagnostic or therapeutic procedure according to departmental or facility policy

p. assess the patient's condition before, during and after the course of treatment or procedure

q. where appropriate, remove markers and accessory equipment/devices before the patient is released

In addition, members in the specialty of magnetic resonance must:

r. ensure that there are no contraindications present that could harm the patient or would exclude the patient from having the examination

s. ensure that all equipment and devices, both patient-specific and accessory, are MR compatible before being brought into the MR area

t. administer and follow the necessary safety precautions for entry to the magnet room to protect themselves, the patient, their colleagues, other members of the health care team and any other individuals who may be present

In addition, members in the specialty of nuclear medicine must:

u. conduct personal and area contamination monitoring

v. decontaminate where necessary in accordance with any licence(s) issued under the *Nuclear Safety and Control Act*

w. use appropriate personal protection equipment when handling radioactive materials in accordance with any licence(s) issued under the *Nuclear Safety and Control Act*

In addition, members in the specialty of radiation therapy must:

x. label and orient all patient-specific ancillary equipment **14**

5. Relationships with patients

Members have patient care as their main concern.

Practice Standard: Members must maintain clear and professional boundaries in relationships with patients and treat all patients with dignity and respect. Members must have the knowledge, skills and judgement to avoid placing patients at unnecessary risk of harm, pain or distress. Members must be able to provide appropriate responses to patient inquiries about procedures and related issues, and accept the patient's autonomy and the right of the patient or the patient's substitute decision maker to consent to or refuse service. Members must understand how and act to protect the confidentiality of all professionally acquired information about patients and the privacy of patients with respect to that information, while facilitating the effective delivery of health care.

Indicators

Members must:

a. provide clear and understandable information to the patient or patient's substitute decision maker prior to, during and after the diagnostic or therapeutic procedure, using an interpreter if necessary

b. give the patient or patient's substitute decision maker an opportunity to ask questions

c. provide the patient or patient's substitute decision maker with answers to their questions within the scope of the profession's responsibility

d. refer questions of the patient or patient's substitute decision maker that are outside the scope of the profession's responsibility to an appropriate health professional for answers

e. carry out diagnostic or therapeutic procedures only with the informed consent of the patient or the patient's substitute decision maker

f. treat the patient with dignity and respect and in accordance with the Code of Ethics of the College

g. make modifications to procedures based on the patient's physical, medical and/or emotional status and needs, based on the member 's assessment of the patient's physical, medical and/or emotional status and needs

h. instruct the patient to remove only the clothing and items that will interfere with the diagnostic or therapeutic procedures

i. provide the patient with a gown or sheet to cover areas where c lothing was removed**15**

j. explain to the patient when and where the member might touch them and why

k. touch the patient in only those areas needed to facilitate carrying out the procedure

l. keep all patient information confidential except when necessary to facilitate diagnosis or treatment of the patient, or when legally obliged or allowed to disclose such information

m. comply with any applicable privacy legislation such as the *Personal Health Information Protection Act* and its regulations

n. comply with all relevant legislation such as the *Health Care Consent Act*

o. comply with the *Regulated Health Professions Act* pertaining to the prevention of sexual abuse and the College's sexual abuse prevention program

6. Professional relationships

Professional relationships in health care settings are based on mutual trust and respect, and result in improved patient care.

Practice Standard: Members must be able to practise effectively within interprofessional care teams to achieve the best possible outcomes for the patient. Members are responsible for communicating about and coordinating care provision with other members of the team, and must be able to take the appropriate action to address gaps and differences in judgement about care provision.

Members may accept the delegation of controlled acts under the *Regulated Health Professions Act* not authorized to members under the *Medical Radiation and Imaging Technology Act*, provided they comply with the *Regulated Health Professions Act* and the Standards of Practice. Members cannot delegate to other individuals controlled acts authorized to members under the *Medical Radiation and Imaging Technology Act*.

Indicators

Members must:

a. use a wide range of communication and interpersonal skills to effectively establish and maintain professional relationships

b. demonstrate an understanding of and respect for the roles, knowledge, expertise and unique contribution by other members of the health care team for the provision of quality care**16**

c. share knowledge with other members of the health care team to promote the best possible outcomes for patients

d. collaborate with other members of the health care team for the provision of quality care

e. participate effectively in interprofessional team meetings

f. resolve concerns about an order or treatment plan by:

1. discussing the concern directly with the responsible health professional

2. providing a rationale and best practice evidence in support of the concern

3. identifying outcomes desired for resolution

4. documenting the concern and steps taken to resolve it in the ap propriate record

g. perform controlled acts not authorized to members under the *Medical Radiation and Imaging Technology Act*, based on delegation, only when the following conditions have been met:

1. the health professional who is delegating the controlled act (the delegator) is a member of a regulated health profession authorized by their health profession Act to perform the controlled act

2. the delegator is acting in accordance with any applicable legislation and any guidelines and policies of their regulatory body governing delegation, and has not been restricted or prohibited from delegating the controlled act

3. the delegator has the knowledge, skills and judgement to perform and delegate the controlled act

4. the member has the knowledge, skills and judgement to perform the controlled act delegated to them safely, effectively and ethically given the circumstances of the situation

5. a written record of the transfer of authority (delegation) and certification of the member's competence is maintained

6. the member complies with any conditions established by the delegator in order for the member to maintain the authority to perform the controlled act

7. patient consent has been obtained**17**

8. the appropriate order authorizing the performance of the controlled act delegated to the member is in place

7. Records and reporting

Creating and maintaining records and reports are essential components of the professional practice of members. Members' records and reports provide information to other health care professionals about relevant aspects of patient care, treatment and assessment.

Practice Standard: Members must be proficient in creating records, charts, incident and other reports that attest to the diagnostic, treatment, quality assurance, workplace and patient safety procedures that have been carried out. Members must have the knowledge, skills and judgement to record information that will adequately identify the subjects of all the images and data they create and treatments they administer. Members must produce records and reports that are accurate, complete, legible and timely.

Indicators

Members must:

a. record results of quality control tests

b. record and report any equipment faults or problems

c. record and notify the patient's physician, authorized health professional, radiologist, nuclear medicine physician, cardiologist or radiation oncologist of any allergies, abnormal test results, pregnancy or other contraindications to the ordered procedure

d. mark all images and data with the patient's identity

e. ensure all images and data are archived according to principles and guidelines established by the employment facility

f. record the patient's reactions to the treatment or procedure or any administered substances

g. record all pertinent aspects of patient care and all procedures performed, including emergency treatments and descriptions of, and reasons for, any deviations from standard procedures on order forms, treatment prescriptions, patient health records or other relevant documentation

h. forward patients' records, images and pertinent data to appropriate recipients[18]

i. record and inform the patient and/or members of the health care team of any follow-up care required

In addition, members in the specialty of nuclear medicine and radiation therapy must:

j. record results of radiopharmaceutical assays, quality control and other tests, radioactive preparations and disposal methods of radioactive materials

In addition, members in the specialty of nuclear medicine must:

k. record receipt and disposal of radiopharmaceuticals, generators and radioactive materials

l. label radiopharmaceutical preparations

m. maintain radiopharmaceutical and pharmaceutical dispensing records

In addition, members in the specialty of radiation therapy must:

n. record and communicate any concerns regarding the treatment or treatment prescription to the appropriate radiation oncology personnel

In addition, members in the specialty of diagnostic medical sonography must:

o. record and communicate their observations and technical impressions regarding the diagnostic ultrasound procedure to the reporting health professional

8. Continuing competence

Members must maintain competence in their current area of practice and continually improve their competence in order to respond to changes in practice environments, advances in technology and the changing health care environment.

Practice Standard: Members must have, maintain and apply the necessary knowledge, skills and judgement to ensure safe, effective and ethical outcomes for the patient. Members must maintain competence in their current area of practice and must refrain from acting if not competent. Members must obtain and maintain the necessary knowledge, skills and judgement to respond to changes in practice environments, advances in technology and other emerging issues. Members must participate in the College's Quality Assurance Program as part of maintaining and improving their competence.[19]

Indicators

Members must:

a. maintain competence and refrain from performing activities that the member is not competent to perform

b. maintain and apply current and relevant scientific and professional knowledge and skills in their practice

c. obtain and maintain the necessary knowledge, skills and judgement to respond to changes in practice environments, advances in technology and other emerging issues

d. assume responsibility for professional development and for sharing knowledge with others

e. invest time, effort and other resources to maintain and improve their knowledge, skills and judgement

f. engage in a learning process to enhance practice

g. participate in the College's Quality Assurance Program

h. collaborate with other members of the health care team to create quality practice settings