

Dual-Energy X-Ray Absorptiometry (DEXA) For Evaluation of Body Composition PROTOCOL

About DEXA

Measurements of body composition have been used to study how lean body mass and body fat change during health and disease. Body composition changes are common in people with HIV infection. Wasting in this population has been well documented. More recently, fat redistribution syndrome or lipodystrophy has become increasingly common in people receiving highly active antiretroviral therapy (HAART).

DEXA systems assess body composition by measuring the differential absorption of x-rays at two frequencies and can separate tissue into fat, lean, and bone mineral. DEXA is relatively easy to administer and uses a very low level of radiation, approximately 1/6 to 1/2 the exposure from a standard chest x-ray. DEXA measurements correlate well with other methods that assess body composition.

Quality Control

Studies have shown that quality assurance is an important issue in the use of DEXA scans to determine body composition. Use of a standardized protocol is essential to achieve consistency of technique. Likewise, because of variability in interpretation of the scans, it is important to use experienced, consistent staff to read each scan.

Procedure (Hologic Discovery A – Bone Densitometer (serial #80310))

The examination procedure involves the following steps:

- Preparations
- Setup or positioning the participant
- Participant Exposure
- Analysis

Preparations

1. The Hologic Discovery A - Bone Densitometer (serial # 80310) can measure participants weighing up to 350 pounds.
2. Make sure that the participant has not had a barium study, radioisotope injection, or intravenous or oral contrast material from a CT scan or MRI within 7 days prior to their DEXA.
3. Verify that the participant has no removable metal objects on his/her body, such as snaps, belts, underwire bras, jewelry, and so on.
4. Ask about unremovable piercings or any internal metals or plastics, such as joint replacements, metal plates, pins or screws. Inform DEXA technician.
5. Provide participant with a hospital gown. Ask him/her to remove all clothing except underwear or socks.

DEXA Protocol, continued

Patient Positioning

Position the patient on the table before you select scan type and scan parameters. Use the following procedure for patient positioning.

1. Verify that the examination table is centered with respect to the cabinet beneath it. If not, use table motion controls on the c-arm to center it. If desired, use c-arm controls to move the c-arm out of the way so that the patient has better access to the table.
2. Have the patient lie supine on the examination table with the patient's head at the right end of the table (when the operator faces the table). Position the patient's body so that it is straight on the mat, as measured against the solid longitudinal whole body lines on the mat. Verify that the patient's head is positioned just below the lateral line at the head end of the mattress.
3. The participant's feet should be within the foot limit line at the foot of the table. If the patient is taller than 6'6" (198 cm), bend the patient's knees to keep feet within the scan limit line. A radiolucent foam cushion can be placed beneath the patient's knees for comfort. Use commercially available cushions for x-ray positioning, *not* the spine scan foot rest.
4. Tape the participant's ankles together, especially if the scan will be used for comparison purposes. *Positioning, including hand and foot positions, must be consistent from scan to scan.*
5. Place participant's arms at participant's side, palms down, with a separation from the thighs. Verify that arms are within whole body scan limit lines on the mattress. A large participant can place hands vertically next to the thighs to ensure that hands and arms remain within limits. For that participant, the hand position should be consistent in future scans.

Participant Exposure

1. For NFHL studies, we do whole body array scan (not single beam).
2. Hologic states that the Effective Dose on the Hologic Discovery A – Bone Densitometer (serial # 80310) equals .01 mGy max..
3. Under standard operating conditions, the effective dose to the patient is less than 5 uSV (or .5 mRem), which is less than ½ of the exposure from a standard x-ray.
1 mRem = approximately 1 day natural background exposure
4. FOR CONSENT PUT <5 mRem and <5 days of natural background radiation exposure to cover it.

See *Conversion Table of Radiation Doses* on next page

DEXA Protocol, continued

Conversion Table of Radiation Doses

Effective dose = (mrem or mR = millirem) (mSv = millisievert) (uSV = microsievert)

1 SV = 1,000,000 uSv

1 Rem = 1,000 mRem

1 mSv = 100 mRem = 1000 uSv

1 uSv = .1 mRem = .001 mSv

1,000 mSv =

100,000 mR =

1,000,000 uSV = 1 SV

100 mSv =

10,000 mR =

100,000 uSV

10 mSv =

1000 mRem =

10,000 uSv

1 mSv =

100 mRem =

1,000 uSV

.1 mSv =

10 mRem =

100 uSV

.05 mSv =

5 mRem =

10 uSV

.01 mSv =

1 mRem =

10 uSV

.005 mSv =

.5 mRem =

5 uSV

.001 mSv =

.1 mRem =

1 uSV