DEXA
(Dual Energy X-ray Absorptiometry/densitometry)

DEXA stands for Dual Energy X-Ray Absorptiometry (or Densitometry). DEXA is a procedure that measures the density of:

- Bone.
- Muscle.
- Body fat.

The best way to diagnose osteoporosis is a bone biopsy. This means taking out a small piece of your bone. This is an invasive procedure that is usually not necessary. Accurate information can be obtained using *non-invasive measures* (without surgery). The current diagnostic techniques include:

- Quantitative computed tomography.
- Dual-photon absorptiometry.
- DEXA.

DEXA has a margin of error of 1% to 2%. It exposes the patient to less radiation than a typical chest x-ray. DEXA results are usually reported as a T-score. This is the number of standard deviations (SD) below the average BMD (bone mineral density) for an adult of the same sex and age. Studies have shown that a 1-SD reduction in bone density results in a twofold to threefold increased risk of fracture.

The following are the Bone Health Diagnostic Categories Based on Bone Density Values. These are the values of the average young adult reported as T-scores.

Normal	Less Than 1 standard deviation (SD) below the mean
Osteopenia	1 to 2.5 SD below the mean
Osteoporosis	More Than2.5 SD below the mean
Severe Osteoporosis	More Than 2.5 SD below the mean, plus one or more fragility fractures

WHO CAN HAVE THIS STUDY

DEXA studies cannot be performed if the patient has had a nuclear medicine study within 1 week, or an x-ray procedure using contrast within 72 hours. DEXA studies should be scheduled before other x-ray or nuclear medicine procedures. If other procedures are not performed a satisfactory length of time before the DEXA procedure, the DEXA procedures will not be performed and the study will need to be rescheduled.
Women who are of child-bearing age must have pregnancy ruled out before undergoing the test. Generally this means having a pregnancy test performed within 1 week of the DEXA procedure.

PROCEDURE

The DEXA determination of bone density is performed with an instrument that uses low energy x-rays. For bone density measurements, scans are typically performed of the *lumbar* (lower) spine, the hip, and the wrist. For body composition measurements, a scan of the entire body is performed. The DEXA instrument is non-confining. It consists of a table and scanning arm (in the shape of a 'C') that houses the x-ray tube on one end of the arm and the detector on the other end.

There is no preparation for these studies.

- The patient should wear light clothing to the clinic as they will be asked to change into a gown or surgical scrub uniform for the study.
- The length of time in the clinic will depend on the number of regions to be scanned. Usually the appointment will be 1/2 hour to 1 hour.
- After changing into a gown or surgical scrub uniform, the patient will have their weight and height measured. For these measurements and scans, patients will remove their shoes. The individual scanning procedures are performed with the patient either lying on top of or sitting next to the scanning table.
- For each scan, the technologist must perform two steps. First they must perform the scan. This is also called

scan acquisition. Second, they must analyze the scan (scan analysis) to determine the information contained within the scan. The DEXA scans are therefore more complicated than standard x-rays. The DEXA scan is performed to actually measure the amount of bone, muscle or fat.

- After the technologist has completed and analyzed the scans, the patient can then change back into their street clothes and leave the clinic.
- All scans are reviewed by one of the nuclear medicine or rheumatologist physicians. A report of the DEXA scan results will be entered into the hospital's computer and record system - usually the same day as the scan.

You should discuss with your caregiver how you are to obtain the information from your scans and determine if treatment is necessary.

Most of this information is courtesy of the NIH. The table of normal values is courtesy of the World Health Organization.

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