## Dual Energy X-ray Absorptiometry (DXA)

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<td><strong>The Technology:</strong></td>
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<td>• Hologic QDR for Windows XP Discovery-A model DXA system.</td>
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<td>• Software: HAS-APEX 3.3</td>
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<td>• The DXA machine uses fan beams.</td>
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<td><strong>Applications:</strong></td>
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<td>• Determines bone mineral density of spine, hip, distal femur and forearm</td>
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<td>• Assesses body composition (lean body mass vs. fat mass)</td>
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<td>• Used in metabolic studies to measure the treatment effect of a medication and/or intervention</td>
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<td>• All scans will provide T and Z scores of bone density</td>
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### Scans Available:
*(See below for more details)*

- Whole Body
- Forearm
- Lateral Lumbar Spine
- Supine Lumbar Spine
- Hip
- Lateral Distal Femur (Specialty)

### Additional Analysis

- Rate of change report
- Hip structural analysis
- Abdominal fat analysis

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All CRC DXA Scans are for research purposes ONLY, not for diagnostic use.
DXA: Whole Body Scan

- Provides body composition information such as fat mass and lean body mass.

- Can differentiate between abdominal/central fat versus peripheral fat. The additional abdominal fat analysis can be completed using this scan.

- This scan does not provide an accurate assessment of bone mineral density.

- This scan is highly reproducible, but not as sensitive to change as other scans. Can be completed once or at time intervals to assess change based on an intervention or disease state.
DXA: 
Forearm Scan

- This scan shows bone loss and growth.
- The forearm is highly reproducible scan and thus is often used to show change over time.
- One of the quickest scans and does not require patient to lay on the table, thus being ideal for those who have trouble getting in and out of a bed.

Sample forearm DXA positioning

DXA: 
Hip Scan

- The hip is an area often effected by bone loss.
- Shows risk of possible hip fractures or other orthopedic issues.
- This scan is less suitable for people with hip replacements.

Above: Sample hip scan using Hologic
Left: Sample hip scan positioning
DXA: Lumbar and Lateral Scans

- **Supine Lumbar Scan**
  - Most Commonly used to assess for osteoporosis.
  - Highly reproducible, and hence used to show changes over time.
  - More difficult to do in people with severe scoliosis or other degenerative diseases.

- **Lateral Lumbar Scan**
  - Provides a side (lateral) view of the lumbar spine.
  - Allows to look at individual vertebrae of the lumbar spine.
  - Not as reliable for overweight and

Above: Sample lumbar spine scan print out using Hologic
Below Left: Sample lateral spinal scan
Below Right: Sample positioning for DXA spinal scans
What the participant can expect

• All females will be asked to provide a small urine sample to conduct a pregnancy test as a standard precaution. (Unless study staff requests otherwise.)

• The scans do subject participants to small amounts of radiation. A whole body scans produces a level of radiation equivalent to flying by airplane from New York to California.

• All subjects will be asked to put on a metal free outfit. A johnnie and hospital pants will be provided. Subjects will be asked to remove any jewelry, metal or hard plastics that can be removed. Study staff may encourage patients to come without jewelry, hairpins, bras with underwire or clasps, or clothes with metal to avoid having as much to remove.

• Subjects will be asked a series of questions regarding their basic joint and bone history, and if they have any metal or plastic artifacts in their body.

• If subject does have metal or other artifacts in their body, they can still have a DXA scan without any pain or problems, the artifact will just show up in the DXA scan. This part of the scan can be omitted if the research team requests it.

• The subject will be asked to lie on the DXA table or sit in a chair next to table, depending on the scans being preformed.

• Subjects will be positioned by the technician according to the needs of each scan. Minor modifications can be made to improve the comfort of the patient. Given the length of scans most patients are able to hold the positions without major modifications.

• Each scan will take between 30 seconds to 3 minutes, depending on the scan. Most scans will need to be repeated a few times in order to get the bone in the desired location.