INTRODUCTION:

Bone mineral density (BMD) measurement identifies patients with low bone density and increased fracture risk. Methods for measuring BMD are non-invasive, painless and available on an outpatient basis. Dual energy x-ray absorptiometry (DXA), previously referred to as DEXA, is the most commonly used method of evaluating BMD and is the only BMD technology for which World Health Organization (WHO) criteria for the diagnosis of osteoporosis can be used. Patients who have a BMD that is 2.5 standard deviations below that of a “young normal” adult (T-score at or below -2.5) are deemed to have osteoporosis. Quantitative computed tomography (QCT) has not been validated for WHO criteria but can identify patients with low BMD compared to the QCT reference database and it can be used to identify patients who are at risk of fracture.

INDICATIONS FOR CT BONE DENSITY STUDY:

For first time baseline screening in female patient with suspected osteoporosis or osteopenia:
- 65 years of age or older.
- 40 years of age or older AND at least ONE of the following risk factors:
  - Currently on medications associated with development of osteoporosis, e.g., steroids or glucocorticosteroids, anticonvulsants, heparin, lithium.
  - Currently a cigarette smoker and has a low body weight (<127 lbs.).
  - Caucasian with estrogen deficiency and low calcium intake or alcoholism.
  - Caucasian with adult history of fracture.
  - Evidence of osteoporosis or osteopenia from x-ray or ultrasound.
  - Patient’s parents or siblings have adult history of fracture.

For first time baseline screening in male patient with suspected osteoporosis or osteopenia and meets one of the following risk factors below:
- Steroid therapy equivalent to 7.5 mg of Prednisone or greater per day for more than three (3) months.
- Initiation of selective estrogen receptor modulators (SERMs), calcitonin, or biphosphonates, e.g., Actonel, Etidronate, Calcimar, Didronel, Evista, Fosamax, Miacalcin within last six (6) months.
- Back pain associated with loss of vertebral body height per x-ray.
- Loss of body height.
- Multiple fractures including compression fractures of the spine.
- Malabsorption syndrome.
- Metabolic bone disease.
- Hyperparathyroidism.
• Hypogonadism.
• Thyroid hormone therapy or hyperthyroidism.
• Chemotherapy.
• Long term Heparin therapy.
• Spinal deformities.
• Renal osteodystrophy.

For screening of an individual with known osteoporosis or osteopenia:
• Has not had a bone mineral density study within the past 23 months.
• Had bone density within past 23 months AND meets any one of the following risk factor criteria:
  o Hormone replacement therapy (females only)
  o SERMs, calcitonin, or biphosphonates within the past 6 months (Actonel, Etidronate, Calcimar, Calcitonin, Didronel, Evista, Fosamax, Miacalcin)
  o Steroid therapy equivalent to 7.5 mg of Prednisone or greater per day for more than 3 months.
  o Back pain associated with loss of vertebral body height per x-ray.
  o Loss of body height.
  o Multiple fractures including compression fractures of the spine.
  o Malabsorption syndrome.
  o Metabolic bone disease. Metabolic bone disease, i.e. osteomalacia and vitamin D deficiency.
  o Hyperparathyroidism.
  o Hypogonadism (males only)
  o Thyroid hormone therapy or hyperthyroidism.
  o Chemotherapy
  o Long term Heparin therapy
  o Spinal deformities
  o Renal osteodystrophy
• In the following situations, follow-up imaging may be required in less than 23 months:
  o Glucocorticoid or anticonvulsant therapy greater than 3 months duration
  o Uncorrected hyperparathyroidism

ADDITIONAL INFORMATION RELATED TO CT BONE DENSITOMETRY:

DXA – Dual energy x-ray absorptiometry (DXA) is most often used to measure bone mineral density due to its low radiation exposure, low precision error, and capacity to measure multiple skeletal sites (spine, hip or total body).

Axial DXA – This provides the “gold standard”. Axial DXA predicts fracture risk at the site being measured.

Peripheral DXA – This device measures BMD at peripheral sites, generally at the heel or wrist. It is relatively cheap and portable and is an option when there is limited access to axial DXA.
REFERENCES


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