MASSACHUSETTS GENERAL HOSPITAL
ENDOCRINOLOGY

New Bone Density Report
September 1, 2020

Scanner: Hologic Discovery A with serial# of 86858 located at 10 Emerson

Bone Density Scan (DXA) 09/04/20 (Details of prior DXA scans on following pages)

Skeletal Site	BMD (g/cm^2)	T-score	Z-score	BMD Change Since Prior Scan
PA Spine	0.765	-2.30	-0.20	-0.037 (-4.6%)* since 03/30/2017
Total Hip (Left)	0.672	-2.20	-0.70	-0.037 (-5.2%)* since 03/30/2017
Femoral Neck (Left)	0.588	-2.30	-0.50	-0.030 (-4.9%)* since 03/30/2017

** Denotes significant change when it exceeds 0.022 g/cm^2 for the spine, 0.027 g/cm^2 for the total hip, 0.029 g/cm^2 for the femoral neck.*

Results of all skeletal sites in one summary table

Interpretation: Osteopenia.

Technical Quality: The PA Spine scan was of marginal quality because of scoliosis (which can decrease or increase BMD) and sclerosis or fracture (which increase BMD). NOTE: We newly excluded one or more vertebrae. To allow comparisons with prior tests, we recalculated the total BMD of all prior spine tests after excluding the same vertebra(e).

FRAX: Based on FRAX(r) 3.6 with self-reported race/ethnicity, this patient's likelihood of hip fracture is 6% and major osteoporotic fracture is 19.4% over the next 10 years. The patient reported the following risks of fracture on a questionnaire: parental history of hip fracture.

FRAX calculations of the patient's 10-year risk of fracture, based on femoral neck bone density and self-reported clinical risk factors

Additional Information:

- *World Health Organization criteria classify adults based on lowest T-score at PA spine, hip or forearm: Normal (T-score >= -1.0), Osteopenia (T-score between -1 and -2.5), or Osteoporosis (T-score <= -2.5). T-scores are compared to peak bone density of a gender and ethnicity matched reference population.*
- *For premenopausal women and men under the age of 50, Z-scores (comparison to age, gender, and ethnicity matched reference population) are used: Above expected range for age (Z-score >= 2.0), Within expected range of age (Z-score 1.9 to -1.9), or Below expected range for age (Z-score <= -2.0).*
- *The National Osteoporosis Foundation recommends that treatment be considered in men aged more than 50 years and in postmenopausal women with ANY of the following: Prior hip or vertebral fractures; T-score of <= -2.5 at the PA spine or hip; or 10 year fracture probability by FRAX of >= 3% for the hip or >= 20% for major osteoporotic fracture.*
- *The FRAX algorithm (https://www.sheffield.ac.uk/FRAX/tool.aspx) is designed to predict 10-year fracture risk in treatment-naive adults between the ages of 40 and 90. It is not intended to be used in those receiving pharmacologic osteoporosis treatment.*
- *Including race/ethnicity in the generation of T- or Z-scores or in the FRAX calculation is complicated, with there being reasons for and against doing such. We and others are actively reviewing the best approach to ensure that we can give patients the best information on their risk of fracture.*

Chart Review

Encounters | Labs | Imaging | Procedures | Surgery | Anesthesia | Cardiology | Neurology

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Medications and orders also

To save time not all records

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"View Image" to see subsequent pages with images and prior bone density results.

Reviewed By: Elaine Yu, MD on 09/08/2020 12:00:40

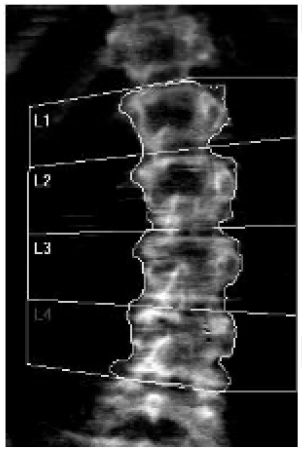
Linked Documents

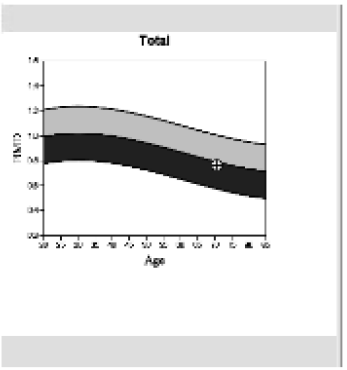
View Image

For providers, click on "View Image" link below the text report within Epic to view bone density images and details of prior DXA scans

Bone Density Scans

PA Spine

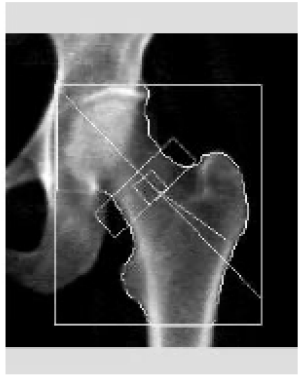


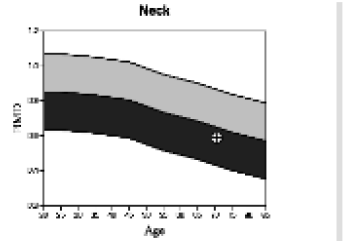


Serial Results: L1 L2 L3

		BMD Change Since	
Date	BMD (g/cm²)	First	Prior
09/04/2020	0.765	-0.049*	-0.037*
03/30/2017	0.802	-0.013	0.006
03/26/2015	0.796	-0.018	0.075*
03/23/2012	0.721	-0.093*	-0.017
06/20/2008	0.738	-0.076*	-0.076*
06/14/2006	0.814	N/A	N/A
* = *significant change*			

Left Hip





Serial Results: Femoral Neck (Left)

		BMD Change Since	
Date	BMD (g/cm²)	First	Prior
09/04/2020	0.588	-0.004	-0.030*
03/30/2017	0.618	0.026	0.031*
03/26/2015	0.587	-0.005	0.054*
03/23/2012	0.533	-0.059*	-0.061*
06/20/2008	0.594	0.002	0.002
06/14/2006	0.592	N/A	N/A
* = *significant change*			

FAQ for the Revised Bone Density Report (DXA)

Q: What does least significant change (LSC) mean?

A: LSC is the minimum amount of bone mineral density (BMD) change that can be considered statistically significant and is dependent upon precision of measurement. For our Hologic DXA machines, BMD change is significant if ≥ the following:

PA spine 0.022 g/cm^2
Total hip 0.027 g/cm^2
Femoral neck 0.029 g/cm^2

Q: When should FRAX be used?

A: FRAX is an online tool to estimate 10-year risks of fracture. It uses country- and ethnic-specific calculations and is meant to be used as a tool to better risk-stratify treatment-naïve osteopenic patients. Current guidelines suggest an intervention threshold of ≥3% for hip fracture and ≥20% for major osteoporotic fracture. These FRAX thresholds are supported by every major Endocrine, Orthopedic, Rheumatology, and OB-Gyn professional association in the U.S.

Q: What if the FRAX results are below the treatment threshold but the bone density T-scores are in the osteoporosis range?

A: FRAX is intended for use in treatment-naïve osteopenic patients. The National Osteoporosis Foundation recommends that treatment be considered in men aged more than 50 years and in postmenopausal women with **ANY** of the following:

- Prior hip or vertebral fractures;
- T-score of ≤ -2.5 at the PA spine or hip; or
- 10 year fracture probability by FRAX ≥ 3% for the hip or ≥20% for major osteoporotic fracture.

Q: What if the patient-reported risk factors are not accurate?

A: The FRAX calculations are created using patient self-reported risk factors. To manually re-calculate FRAX scores, please utilize the website https://www.sheffield.ac.uk/FRAX/tool.aspx