

# The 3D Volumetric Spine Advantage

## *Faster*

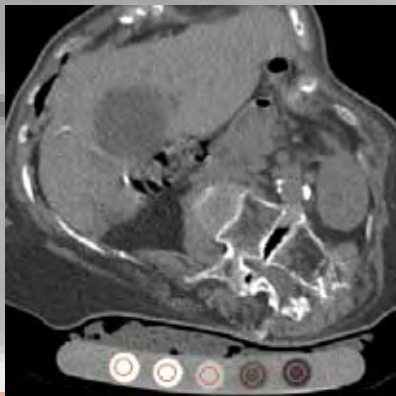
- Takes advantage of your helical/multi-slice scanner to expedite BMD studies
- Scan time typically less than 30 seconds

## *Easier and Simpler*

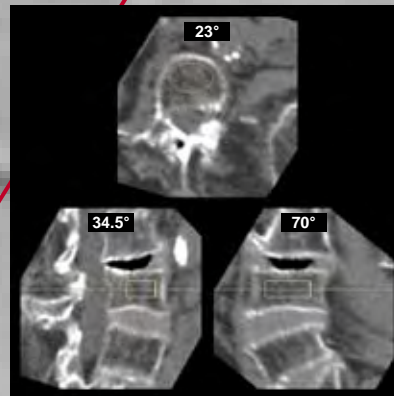
- Simpler scan localization—define only scan start and end points
- No gantry angulation—no need to stop/start scan for each slice
- Only 2 vertebral bodies scanned instead of 3 or 4

## *Clinically Advantageous*

- Sensitive serial comparisons
  - Monitor changes in trabecular bone only
  - Best published precision, sub 1%
- Easily measure patients with severe scoliosis
  - Retrospective ROI adjustment in any arbitrary plane
- Adjust ROI height/location/angle to successfully measure patients with scoliosis and other degenerative conditions that are impossible with other methods
- Extract BMD measurements from routine abdomen CT studies with no extra scans or exposure



**Before Rotation**



**After Rotation**

*The spine of the severely scoliotic patient depicted in the background CT axial image would require 23° axial, 34.5° sagittal, and 70° coronal gantry angulation to position a standard ROI within the vertebral body. The 3D QCT method of rotating the patient in software instead of angling the gantry allows even severely scoliotic patients to be easily accommodated.*

# 3D QCT Bone Mineral Densitometry

## Patient Information

Name: Burton, Madeline  
 ID: 2491688  
 Date: 2/8/2002  
 Sex: Female  
 DOB: 6/12/1935  
 Age: 66  
 Exam: 53  
 Radiologist: Murray Sullivan  
 Referring MD: William Baker  
 Comments: 2 yr followup on Fosamax

## Analysis Results

BMD in mg/cc K<sub>2</sub>HPO<sub>4</sub>

T11:	-
T12:	-
L1:	86.0
L2:	91.0
L3:	72.5
L4:	-
Average:	83.2
Age Matched Normal (UCSF):	93.6 ± 26
Z-Score:	-0.40
T-Score:	-3.28

## Comparison with Previous Examinations

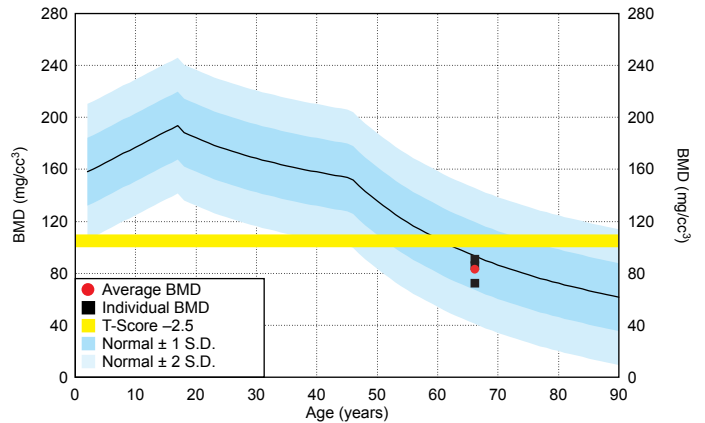
Date	Avg. BMD	Change (mg/cc)
4/15/1998	105.3	-
3/20/2000	85.5	-19.8
2/8/2002	83.2	-22.1

Change per year: -5.80

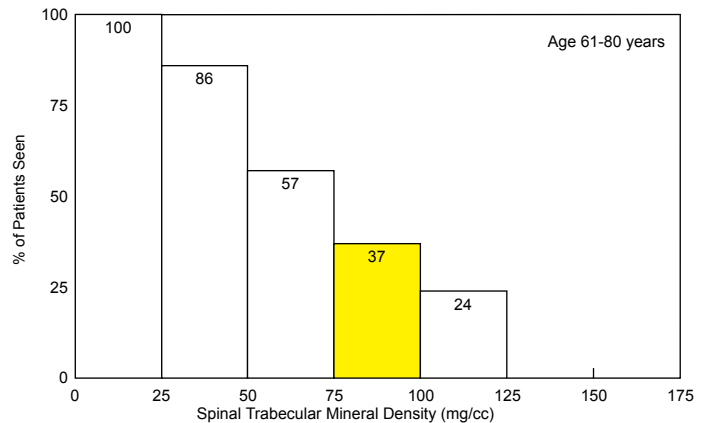
The above analysis based on BMD results for L1 and L2 and L3 from each exam.

Results do not include a correction for variations in bone marrow fat.

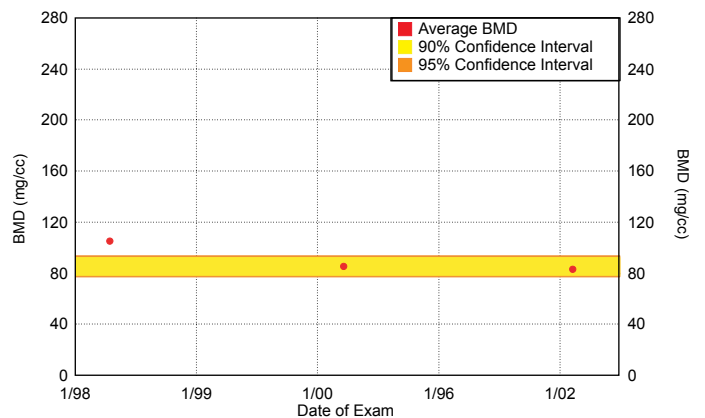
Confidence intervals based on a precision of 3.0 mg/cc.



Patient BMD Value Compared To Age and Sex Matched Control Data (UCSF)



Prevalence of Vertebral Compression Fractures in Untreated Postmenopausal Women Scanned at UCSF



Comparison with Previous Examinations

**Interpretation:** Patient treated with Fosamax past 2 years. Spinal trabecular density of 83.2 mg/cm<sup>3</sup> indicates mild osteoporosis, below baseline value of 105 mg/cm<sup>3</sup>. Consistent with treatment preventing further bone loss since last exam. Note is made of significant aortic with some other vascular calcification.

Murray Sullivan, MD

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Name: BURTON, MADELINE  
ID: 2491688  
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DOB: 6/12/1915  
Sex: Female  
Age: 66  
Exam: 53  
Radiologist: Murray Sullivan  
Referring Physician: William Baker  
Technologist: CF  
Comments: 2 yr followup on Fosamax

**Scan Parameters**

Vertebra Analyzed: L1, L2, L3  
L1 ROI: area=248.5 mm<sup>2</sup>, width=22.5 mm, height=14.1 mm, depth=9.0 mm  
L2 ROI: area=260.9 mm<sup>2</sup>, width=22.5 mm, height=14.8 mm, depth=9.0 mm  
L3 ROI: area=264.8 mm<sup>2</sup>, width=21.8 mm, height=15.5 mm, depth=9.0 mm  
kVp: 120  
SFOV: 500 mm  
FUC: 1.019  
Table Height: 177.80

