



**Hospital Name**  
Chief Name  
Hospital Address  
Phone Number

**Patient:**  
Sex - Ethnicity:  
Height - Weight:  
Referring physician:  
DXA Acquisition date:

City/Zip Code  
email@email.com

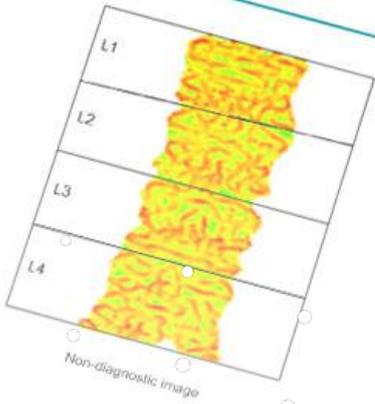
Humphrey, Jenny  
Female - White  
154.7 cm - 63.0 kg  
SG02  
10/04/2018

**Patient ID:**  
Date of birth - Age:  
BMI - Tissue Thickness (TT spine):

752-99-8574  
10/12/1950 - 65 years  
26.3 - 20.1 cm

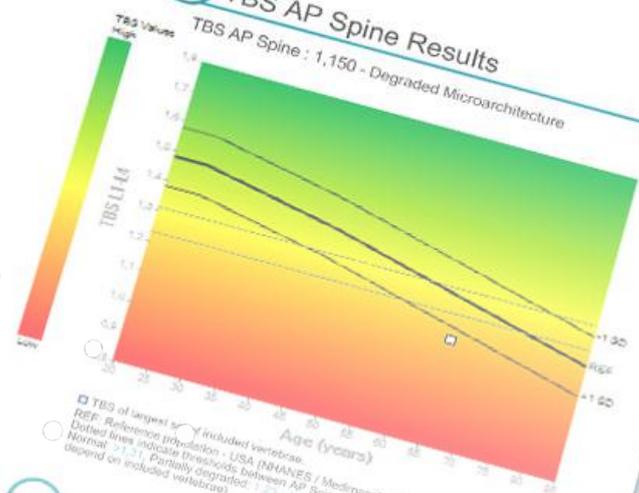
TBS Report last modified date: 27/01/2025 14:37

**1 TBS Mapping**



**BONE HEALTH REPORT**

**2 TBS AP Spine Results**



**3 Bone Status Assessment**

Osteoporosis is a systemic skeletal disease characterized by low bone mass and microarchitectural deterioration of bone tissue, with a consequent increase in bone fragility and susceptibility to fracture.

TBS is derived from the texture of the DXA image and has been shown to be related to bone microarchitecture and fracture risk. It provides complementary information about bone health, independent of BMD.

"Bone Fragility Index" is defined as the combination of T-Score and absolute TBS tertile categories. Bone Fragility Index Zones are based upon

BMD T-score*	Bone Fragility Index Zones		
	Normal	Low	High
Normal	Normal	Low	High
Osteopenia	Low	High	Very High
Osteoporosis	High	Very High	Extremely High

**4 Analytical Tools**

FRAX® 10-year probability of fracture:

Type of Fracture	Major Osteoporotic	Fracture Risk	FRAX(R) adjusted for TBS*
Hip	<input type="checkbox"/>	5.9 %	18.1 %
Major Osteoporotic	<input type="checkbox"/>	1.4 %	1.8 %

BMD T-Score:

Site	BMD T-Score	BMD T-Score adjusted for TBS*
AP Spine (L1-L4)	-1.9	-2.4
Femoral Neck, left	-1.2	-1.5
Total Hip, left	-0.5	0.8

# TBS Report

Easy interpretation steps



Easy to interpret All-In-One report  
(BMD, FRAX<sup>®</sup>, TBS)



Automatic generated report  
with option for customizable  
conclusions



Option to print and/or send to  
PACS (DICOM SR)

# All-in-one report

TBS Osteo creates a comprehensive report combining BMD, clinical risk factors or FRAX®, and TBS score to provide the full picture of a patient's risk of fracture. The software helps generate auto-editable conclusions following medical society guidelines for easy interpretation.

All-In-One Bone Health Report is available for Hologic and GE Healthcare DXA devices\*.

**Hospital Name**  
 Chief Name  
 Hospital Address  
 City/Zip Code Phone Number  
 email@email.com

Patient: Humphrey, Jerry Patient ID: 750-86-6374  
 Sex - Ethnicity: Female - White Date of birth - Age: 10/12/1950 - 65 years  
 Height - Weight: 154.7 cm - 63.0 kg BMD - Tissue Thickness (TT) appax: 26.3 - 20.1 cm  
 Referring physician: SGGC  
 DXA Acquisition date: 10/04/2018 TBS Report last modified date: 27/01/2025 14:37

**BONE HEALTH REPORT**

**1 TBS Mapping**

**2 TBS AP Spine Results**  
 TBS AP Spine: 1.150 - Degraded Microarchitecture

**3 Bone Status Assessment**  
 Osteoporosis is a systemic skeletal disease characterized by low bone mass and microstructural deterioration of bone tissue, with a consequent increase in bone fragility and susceptibility to fracture.  
 TBS is derived from the texture of the DXA image and has been shown to be related to bone microarchitecture and fracture risk. It provides complementary information about bone health, independent of BMD.  
 "Bone Fragility Index" is defined as the combination of BMD T-Score and absolute TBS tertile categories. Bone Fragility Index Zones are based upon fracture risk.

BMD T-Score	BMD T-Score*		
	Normal	Osteopenia	Osteoporosis
High	Low	High	Very High
Medium	Low	High	Very High
Low	Low	High	Very High

**4 Analytical Tools**

FRAX® 10-year probability of fracture:

Type of Fracture	Fracture Risk	FRAX(R) adjusted for TBS*
Major Osteoporotic	10.3 %	18.1 %
Hip	1.4 %	1.8 %

**BMD T-Scores:**

Bone site	BMD T-Score	BMD T-Score adjusted for TBS*
AP Spine (L1-L4)	-1.9	-2.4
Femoral Neck left	-1.2	-1.5
Total Hip left	-0.5	-0.8

TBS Osteo MEDIMAPS Page 1 / 2

**Hospital Name**  
 Chief Name  
 Hospital Address  
 City/Zip Code Phone Number  
 email@email.com

Patient: Humphrey, Jerry Patient ID: 750-86-6374  
 Sex - Ethnicity: Female - White Date of birth - Age: 10/12/1950 - 65 years  
 Height - Weight: 154.7 cm - 63.0 kg BMD - Tissue Thickness (TT) appax: 26.3 - 20.1 cm  
 Referring physician: SGGC  
 DXA Acquisition date: 10/04/2018 TBS Report last modified date: 27/01/2025 14:37

**BONE HEALTH REPORT**

**5 Detailed AP Spine Results**

Region	TBS	TBS Z-Score*	BMD (g/cm³)	BMD T-Score
L1	1.061	N/A	0.907	-1.1
L2	1.004	N/A	0.796	-2.3
L3	1.167	N/A	0.841	-2.2
L4	1.176	N/A	0.912	-1.9
L1-L4	1.192	-1.4	0.842	-1.9
L1-L4(2)	1.144	-1.5	0.815	-1.9
L1-L4(3)	1.149	-1.4	0.843	-1.7
L2-L4	1.193	-1.5	0.857	-1.9
L2-L4	1.193	-1.2	0.853	-2.1
L1-L2	1.122	-1.5	0.801	-1.8
L1-L3(2)	1.114	-1.7	0.823	-1.7
L1-L4(2,3)	1.115	-1.5	0.864	-1.8
L3-L3	1.189	-1.3	0.919	-2.2
L3-L4(3)	1.187	-1.5	0.859	-2.0
L3-L4	1.169	-1.2	0.879	-2.0

**6 FRAX Curve**

**7 Conclusion**  
 The patient's AP lumbar spine TBS is 1.150, which suggests a degraded microarchitecture compared to the reference population.  
 The lowest BMD T-Score (with or without TBS-adjustment) positions the patient in the category of Osteopenia.  
 The patient's combined BMD T-Score categories and absolute TBS tertile categories suggest a High Bone Fragility Index.  
 The patient's highest FRAX® 10-year fracture risk (with or without TBS-adjustment) for MCF is 18.1%, and for hip is 1.8%. These results should be interpreted regarding the intervention thresholds provided by national medical guidelines.  
 Final decision in diagnostic or therapeutic recommendations should include BMD, TBS, disease risk factors as well as the clinical context of the patient.

**8 Notes & References**

TBS Report last modified date 27/01/2025 14:37  
 TBS Report template version used: 1.0.0.2  
 TBS (Ridge™) version: 4.0.1.2965  
 Soft tissue correction based on Tissue Thickness at spine (TT appax)  
 BMD T-Score reference: White Gender Match  
 DXA Horizon #1 - File: PA07415A.P15

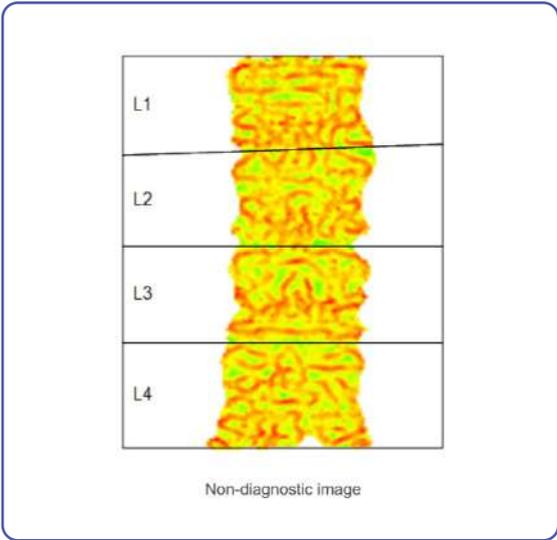
- Consensus Dev. Conf. Am J Med (1993), vol 94, pp 846-850
- Adapted from JBMR (2011), vol 26, pp 2752-2759
- WHO (2005), ISBN 9241200214
- JBM (2015), vol 31(5), pp 943-948
- Adapted from Osteoporos Int (2016), vol 26, pp 751-756

Abbreviations: AP - anterior-posterior; BMD - Bone mineral density (BMD); Body mass index; DXA - dual-energy X-ray absorptiometry; L - lumbar vertebrae; TBS - trabecular bone score; TT - tissue thickness

Learn more about TBS: [www.medimaps.it](http://www.medimaps.it)

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\*Contact your local distributor or sales representative to learn more about the DXA versions that support the All-in-one Report.

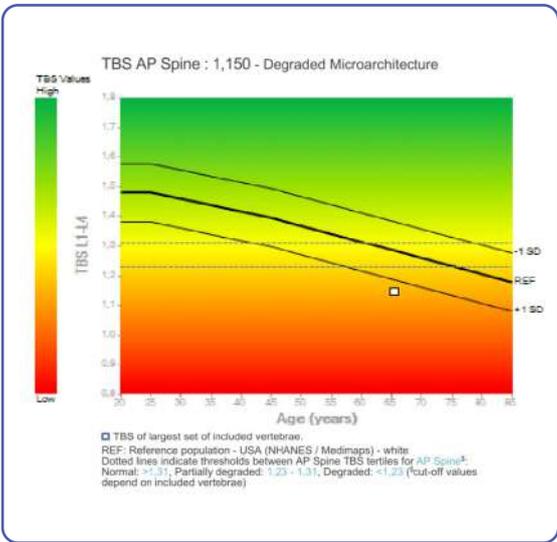


# 01 | TBS mapping

**Description:** AP lumbar spine image. The TBS (trabecular bone score) mapping color scale is designed to highlight the contours of local TBS.

**Benefit:** Supports patient positioning and bone mask verification for accurate computation, especially for patient monitoring.

- ✓ **Red:** low TBS value
- ✓ **Green:** high TBS value



# 02 | TBS AP spine results

**Description:** AP spine TBS is plotted on a reference graph to reflect the bone microarchitecture of the patient in the context of a selected reference population.

**Benefit:** Immediately identify the patients microarchitecture status compared to a reference population (REF line).

Osteoporosis is a systemic skeletal disease characterized by low bone mass and microarchitectural deterioration of bone tissue, with a consequent increase in bone fragility and susceptibility to fracture.<sup>1</sup>

TBS is derived from the texture of the DXA image and has been shown to be related to bone microarchitecture and fracture risk. It provides complementary information about bone health, independent of BMD.

"Bone Fragility Index" is defined as the combination of BMD T-Score and absolute TBS tertile categories. Bone Fragility Index Zones are based upon fracture risk.<sup>2</sup>

		BMD T-score*		
		Normal	Osteopenia	Osteoporosis
TBS Tertile**	Normal	Low	Moderate	High
	Partially degraded	Moderate	High	Very High
	Degraded	High	Very High	Very High

□ Current Bone Fragility Index Zone

Bone Fragility Index Zones

\* BMD T-score is the minimum value of spine, total hip, femoral neck or 1/3rd radius.  
 Normal > -1.0, Osteopenia: -1.0 to < -2.5, Osteoporosis: < -2.5<sup>3</sup>  
 \*\* AP Spine TBS tertiles for L1-L4: Normal > 1.31, Partially degraded: 1.23 - 1.31, Degraded: < 1.23 (cut-off values depend on included vertebrae)<sup>4</sup>

# 03 | Bone status assessment

**Description:** Table combining BMD T-Score and TBS (microarchitecture classification) to determine the Bone Fragility Index and assess fracture risk.

**Benefit:** The combination of BMD and TBS, provides a more comprehensive understanding of the patient's bone health status. This combined evaluation results in a bone fragility classification for the patient, ranging from low to very high.

## 04 | Analytical tools

FRAX® 10-year probability of fracture:

Type of Fracture	Fracture Risk	FRAX(R) adjusted for TBS*
Major Osteoporotic	15,9 %	18,1 %
Hip	1,4 %	1,8 %

Reported clinical risk factors: glucocorticoids, rheumatoid arthritis  
 Lowest Femoral Neck BMD: left  
\*Validated for Caucasian and Asian women and men.<sup>2</sup> Refer to local guidelines before using these values. Refer to local guidelines before using these values.

BMD T-score:

Bone site	BMD T-Score	BMD T-Score adjusted for TBS*
AP Spine (L1-L4)	-1,9	-2,4
Femoral Neck left	-1,2	-1,5
Total Hip left	-0,5	-0,8

\* Validated for Caucasian women > 50 years<sup>2</sup>. Greyed cell represents minimum value.

**Description:** FRAX® adjusted for TBS, BMD T-Score and BMD T-Score adjusted for TBS.

**Benefit TABLE 1:** Refines fracture prediction. FRAX® adjusted for TBS as a therapeutic decision tool.

**Benefit TABLE 2:** Lowest BMD T-Score adjusted for TBS helps in diagnosis of osteoporosis and deciding on intervention thresholds.

## 05 | Detailed AP spine results

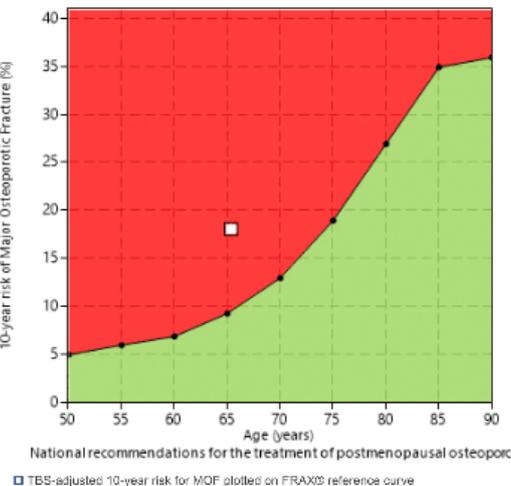
Region	TBS	TBS Z-Score*	BMD (g/cm <sup>2</sup> )	BMD T-Score
L1	1,061	n/a	0,807	-1,1
L2	1,204	n/a	0,796	-2,1
L3	1,167	n/a	0,841	-2,2
L4	1,170	n/a	0,912	-1,9
L1-L4	1,150	-1,4	0,842	-1,9
L1-L3	1,144	-1,5	0,815	-1,8
L1-L4(L3)	1,145	-1,4	0,843	-1,7
L1-L4(L2)	1,133	-1,5	0,857	-1,8
L2-L4	1,180	-1,2	0,853	-2,1
L1-L2	1,132	-1,5	0,801	-1,6
L1-L3(L2)	1,114	-1,7	0,824	-1,7
L1-L4(L2L3)	1,115	-1,5	0,864	-1,6
L2-L3	1,185	-1,3	0,819	-2,2
L2-L4(L3)	1,187	-1,0	0,859	-2,0
L3-L4	1,169	-1,2	0,879	-2,0

Detailed TBS and BMD results for individual vertebrae and combinations.  
TBS Z-Score compares the patient's TBS to the average TBS of the same-age reference population in terms of standard deviations.

**Description:** Comprehensive and detailed listing table of TBS and BMD results of individual vertebra and combinations.

**Benefit:** Visualize differences between individual vertebrae. This can be useful in cases of vertebral exclusion.

## 06 | FRAX® curve



**Description:** FRAX® reference curve to plot FRAX® adjusted for TBS. The displayed plot can be adapted to reflect local guidelines.

**Benefit:** Automatically plotted FRAX®, adjusted for TBS, provides patient classification according to local guidelines, aiding in making informed therapeutic treatment decisions (personalized treatment).

The patient's AP lumbar spine TBS is 1,150, which suggests a degraded microarchitecture compared to the reference population.

The lowest BMD T-Score (with or without TBS-adjustment) positions the patient in the category of Osteopenia.

The patient's combined BMD T-Score categories and absolute TBS tertile categories suggest a High Bone Fragility Index.

The patient's highest FRAX® 10-year fracture risk (with or without TBS adjustment) for MOF is 18.1% and for hip is 1.8%. These results should be interpreted regarding the intervention thresholds provided by national medical guidelines.

Final decision in diagnostic or therapeutic recommendations should include BMD, TBS, disease risk factors as well as the clinical context of the patient.

## 07 | Conclusion

**Description:** Automatically pre-filled and fully editable report.

**Benefit:** Automation saves time in reporting outcomes while giving flexibility to edit.

TBS Report last modified date 27/01/2025 14:37  
 TBS Report template version used: 1.0.0.2  
 TBS iNsiht™ version 4.0.1.2960  
 Soft-tissue correction based on Tissue Thickness at spine (TT spine).  
 BMD T-Score reference: White Gender Match  
 DXA Horizon #1 - File: PA07410A.P05

1. Consensus Dev. Conf., Am J Med (1993), vol 94, pp.646-650
2. Adapted from JBMR (2011), vol 26, pp.2762-2769
3. WHO (2003), ISBN 9241209216
4. JBMR (2016), vol 31(5), pp.940-948
5. Adapted from Osteoporos Int. (2018), vol 29, pp.751-758

Abbreviations: AP: anterior-posterior, BMD: Bone mineral density, BMI: Body mass index, DXA: dual-energy X-ray absorptiometry, L: lumbar vertebra, TBS: trabecular bone score, TT: tissue thickness

Learn more about TBS: [www.medimaps.ai](http://www.medimaps.ai)

## 08 | Notes & references

**Description:** This section displays report metadata and literature references.

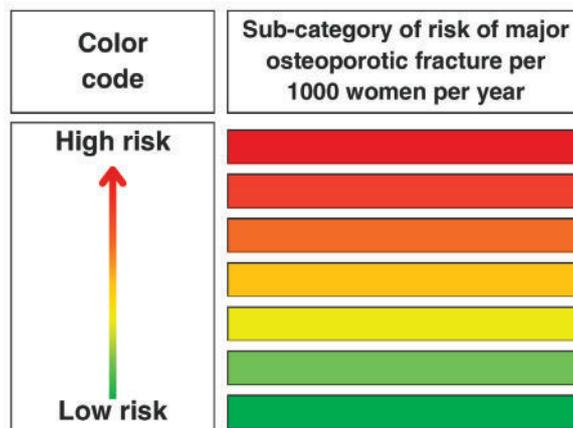
**Benefit:** Clear report traceability.

## Interpretation TBS values and bone density use in patient management

Trabecular Bone Score (TBS), together with the BMD and additional clinical risk factors is an aid for patient management. All diagnosis and treatment decisions require clinical judgement and consideration of the clinical context of the patient.

Risk stratification of TBS and BMD enhances the accuracy of fracture risk assessment, particularly in osteopenic patients and patients with secondary osteoporosis<sup>1</sup>. The following table presents the level of fracture risk expressed as the number of major osteoporotic fractures per 1000 women/year (based on a study conducted on 30,000 women)<sup>2</sup>.

		Level of risk based on classification of the WHO (BMD minimum T-score of proximal femur or lumbar spine)		
		Normal	Osteopenia	Osteoporosis
Risk level based on TBS of the spine	Normal			
	Partially degraded			
	Degraded			



To learn more  
**register to the e-learning**  
of TBS Osteo

1. Shevroja, E., Reginster, JY., Lamy, O. et al. Update on the clinical use of trabecular bone score (TBS) in the management of osteoporosis: results of an expert group meeting organized by the European Society for Clinical and Economic Aspects of Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (ESCEO), and the International Osteoporosis Foundation (IOF) under the auspices of WHO Collaborating Center for Epidemiology of Musculoskeletal Health and Aging. *Osteoporosis Int* 34, 1501–1529 (2023)
2. Adapted from Didier Hans et al. (2014). Bone microarchitecture assessed by TBS predicts osteoporotic fractures independent of bone density: the Manitoba study. *Journal of Bone and Mineral Research*. DOI:10.1002/jbmr.499



# MEDIMAPS

We understand bone health

Founded by medical practitioners and clinical researchers, Medimaps combines Swiss innovation with a global presence to lead in bone health management. We provide healthcare professionals worldwide with advanced AI-driven software that enables comprehensive bone microarchitecture assessment.

Our passion for musculoskeletal health is underpinned by scientific knowledge, collaborations with world-class academics, clinicians, industry partners, and direct patient engagement. The science behind our cutting-edge imaging applications and clinical evidence forms the core of our company's DNA.



swiss made software

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