

Osteoporosis Risk Assessment & Screening Guide

Osteoporosis and low bone mass is currently a major public health threat to the US with nearly 43.4 million Americans having low bone mass and more than 12.3 million Americans having osteoporosis.¹

Having a fracture can lead to significant cost in health care spending as well as major impact on one's quality of life. This document serves as a guide to help providers assess a patient's risk for fractures and to determine when to screen patients.

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SCREENING FOR OSTEOPOROSIS:

WHO SHOULD HAVE A BONE MINERAL DENSITY (BMD) TEST?

- A dual-energy X-ray absorptiometry (DEXA) scan should be used to check BMD and screen for osteoporosis in the following patients^{1,2}:
 - Women aged 50-64 years with risk factors*
 - Women aged 65 years and older
 - Men aged 50-69 years with risk factors*
 - Men aged 70 years and older
 - Anyone who has broken a bone after age 50

*Examples of risk factors for osteoporosis and fractures include family history of osteoporosis and/or fracture, frequent falling, vitamin D deficiency, smoking, excessive alcohol intake, malabsorption, and some medications, such as prednisone

RISK ASSESSMENT TOOLS:

Several screening tools are available to help providers determine a patient's risk of fractures and/or risk of developing osteoporosis. These tools may provide further guidance in determining who may need a BMD test.

TOOLS*	DESCRIPTION
The Fracture Risk Assessment (FRAX) Tool	<ul style="list-style-type: none"> • Most validated and widely used tool which is available as an online algorithm for several different countries.^{1,3} • Estimates the 10-year probability of hip fracture and major osteoporotic fracture (MOF) combined (hip, spine, shoulder, or forearm). • To be used in untreated women or men with easily obtainable information to assess fracture risk with or without information on BMD.
Osteoporosis Self-Assessment Tool (OST)	<ul style="list-style-type: none"> • Predicts risk of osteoporosis based solely on current weight and age and can be used for men and women.^{4,5}
Osteoporosis Risk Assessment Instrument (ORAI)	<ul style="list-style-type: none"> • Used in post-menopausal women only. • Uses age, weight, and estrogen use as an aid to determine one's risk of osteoporosis and if a BMD test is needed.^{4,6}
Osteoporosis Index of Risk (OSIRIS)	<ul style="list-style-type: none"> • Used in post-menopausal women only. • Based on four variables to predict osteoporosis risk: age, body weight, current estrogen use, and history of previous low impact fracture.^{4,7}
The Simple Calculated Osteoporosis Risk Estimation (SCORE)	<ul style="list-style-type: none"> • Used in post-menopausal women only at risk of osteoporosis.⁴ • Stratifies osteoporosis risk using six factors, each of them with answer choices that are weighted in a formula: age, weight, estrogen use, race, rheumatoid arthritis, fracture history.

*See appendix for more information on how tools are scored and assessed in patients.

SCREENING INTERVALS FOR PATIENTS AT RISK:

A repeat BMD test should be performed **every two years if the patient**⁸:

- Has an initial BMD test showing low bone mass with a **T-score of -2.00 to -2.49 at any site**.*
- Has a **condition that can adversely affect bone health** (i.e., rheumatoid arthritis, hypogonadism, premature menopause, alcoholism, conditions that cause malabsorption etc.).
- Is taking **medications that can decrease bone density and/or increase fracture risk** (see below).

COMMON DRUGS ASSOCIATED WITH BONE LOSS & FRACTURES^{9,10}

Glucocorticoids (GCs)**	Unfractionated Heparin (UFH)
Warfarin	Thiazolidinediones (pioglitazone, rosiglitazone)
Medroxyprogesterone acetate	Anti-Seizure Medications (ASMs)
Proton Pump Inhibitors (PPIs)	Selective Serotonin Reuptake Inhibitors (SSRIs)

*See appendix for information on interpreting T-score results.

**See appendix for more details on glucocorticoids and how dosing and/or treatment duration can affect bone health.

APPENDIX:

1. T-score Interpretations:

- A T-score is a result from a BMD test that indicates how one's BMD is when compared to that of a young healthy adult of the same sex.¹ **A lower T-score indicates a lower bone density.**

T-SCORE RESULT	CATEGORY
-1.00 and above	Normal Bone Density
-1.00 to -2.50	Low Bone Density or Osteopenia
-2.5 and below	Osteoporosis

2. Risk Screening Tools:

TOOL	RISK FACTORS	SCORING	FREQUENTLY USED THRESHOLDS TO DETERMINE RISK
FRAX ^{4,11}	Age (years), sex, weight (kg), height (cm), previous fracture, parental hip fracture, current smoking, glucocorticoid use, rheumatoid arthritis, conditions that cause secondary osteoporosis (i.e., hypogonadism, premature menopause, liver disease, malabsorption), alcohol consumption ≥ 3 units/day, with or without BMD of femoral neck	Refer to website for specific country-based algorithm (https://frax.shef.ac.uk/FRAX/)	Consider starting osteoporosis treatment when BMD test shows osteopenia (T-score -1 to -2.5) and a 10-year probability for $\geq 3\%$ for hip fracture and/or $\geq 20\%$ for major osteoporotic fracture (MOF). ^{*1}
OST ^{4,11}	Weight, kg Age, years	(kg - years) x 0.2	If score is <2 points , consider referring patient for BMD test. [^]
ORAI ^{4,11}	Age, years:		If score is ≥ 9 points , consider referring patient for BMD test. [^]
	≥ 75	+15 points	
	65-74	+9 points	
	55-64	+5 points	
	45-54	0	
	Weight, kg:		
	<60	+9 points	
	60-69	+3 points	
≥ 70	0		
	No current estrogen use	+2 points	
OSIRIS ^{4,7,11}	Age, years	(-0.2) x age	If score is ≤ 1 point , consider referring patient for BMD test. [^]
	Weight, kg	(0.2) x weight	
	Current estrogen use	+2 points	
	Prior low-impact fracture	-2 points	
SCORE ^{4,11}	Non-black race	+5 points	If score is ≥ 6 points , consider referring patient for BMD test. [^]
	Rheumatoid arthritis	+4 points	
	Prior rib/wrist/hip fracture	+4 points for each type of nontraumatic fracture after age 45 (max of 12 points)	
	Never used estrogen	+1 point	
	Age, years	3 x first digit of age	
	Weight, lbs	(-1 x weight) / 10	

Abbreviations: FRAX=Fracture Risk Assessment Tool; ORAI=Osteoporosis Risk Assessment Instrument; OSIRIS=Osteoporosis Index of Risk; OST=Osteoporosis Self-Assessment Tool; SCORE=Simple Calculated Osteoporosis Risk Estimation

^{*8.4%} represents the 10-year MOF risk in a 65-year-old Caucasian woman without any other risk factors in the US. Some experts say in women under ≤ 65 years with a MOF above 8.4% who have not had a BMD test, a BMD test should be performed.¹¹

[^]The thresholds listed above for these tools are based on validation studies that may have been limited to certain populations only (i.e., postmenopausal Caucasian women).^{4,7} Therefore, these thresholds may not correlate well to other populations as more studies/research is needed.

3. When should a BMD test be repeated in patients without osteoporosis and who have no risk factors?⁸

T-SCORE RESULT AT ANY SITE	NEXT BMD TEST*
-2.00 to -2.49	2 years
-1.50 to -1.99	3-5 years
-1.01 to -1.49	10-15 years

**Note: The frequency of how often one should get a BMD test may change if patient develops risk factors for bone loss (i.e., develops certain conditions or begins taking medications that reduce bone density). Providers may use screening tools such as FRAX to assess patient's risk of osteoporosis and if a BMD test should be completed sooner.*

4. Glucocorticoid-Induced Osteoporosis (GCOP)¹²:

- The most common cause of iatrogenic osteoporosis when taken long-term (3 months or longer).
- May occur in 30-50% of patients on chronic glucocorticoid therapy.
- Doses as low as 2.5 mg of prednisone per day can be a risk factor for fracture, but the risk is greater with higher doses.
 - Fracture risk increases markedly in the first 3 months after initiation (even at low doses).
 - Vertebral fractures have even occurred in patients at normal-to-high BMD while receiving GCs compared to patients not receiving them.
- To avoid risk of developing osteoporosis and avoiding fractures, it is recommended to use the minimal effective glucocorticoid dose for the least amount of time possible.

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