



MASSACHUSETTS

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Medical Policy

Bone Mineral Density Studies

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NCD/LCD: Local Coverage Determination (LCD): Category III CPT® Codes (L33392) (A56195)

Medicare Benefit Policy Manual - Pub 100-02 Medicare Benefit Policy

Related Policies

- Vertebral Fracture Assessment with Densitometry, #[449](#)
- Bone Turnover Markers for Diagnosis and Management of Osteoporosis and Diseases Associated with High Bone Turnover, #[549](#)

Policy

Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity

Initial or repeat bone mineral density (BMD) measurement is not indicated unless the results will influence treatment decisions.

An initial measurement of central (hip/spine) BMD using dual x-ray absorptiometry (DXA) may be considered **MEDICALLY NECESSARY** to assess fracture risk and the need for pharmacologic therapy in both women and men who are considered at risk for osteoporosis. BMD testing may be indicated under the following conditions:

- Women age 65 and older, regardless of other risk factors;
- Men age 70 and older, regardless of other risk factors;
- Younger postmenopausal women with an elevated risk factor assessment;*
- Men age 50 to 70 with an elevated risk factor assessment;*
- Adults with a condition associated with low bone mass or increased bone loss
- Adults taking a medication associated with increased bone loss.

*The decision to perform a bone density assessment should be based on an individual's fracture risk profile and skeletal health assessment. In addition to age, sex, and BMD, risk factors included in the World Health Organization Fracture Risk Assessment Tool are:

- Low body mass index;
- Parental history of hip fracture;

- Previous fragility fracture in adult life (ie, occurring spontaneously or a fracture arising from trauma, which, in a healthy individual, would not have resulted in a fracture);
- Current smoking or 3 or more units of alcohol daily, where a unit is equivalent to a standard glass of beer (285 mL), a single measure of spirits (30 mL), a medium-sized glass of wine (120 mL), or 1 measure of an aperitif (60 mL);
- A disorder strongly associated with osteoporosis, which includes rheumatoid arthritis, type I (insulin-dependent) diabetes, osteogenesis imperfecta in adults, untreated long-standing hyperthyroidism, hypogonadism or premature menopause (<45 years), chronic malnutrition or malabsorption, and chronic liver disease;
- Current exposure to oral glucocorticoids or exposure to oral glucocorticoids for more than three months at a dose of prednisolone 5 mg daily or more (or equivalent doses of other glucocorticoids).

Repeat measurement of central (hip/spine) BMD using dual x-ray absorptiometry for individuals who previously tested normal may be considered **MEDICALLY NECESSARY** at an interval not more frequent than every 3 to 5 years; the interval depends on an updated patient fracture risk assessment.

Repeat measurement of central (hip/spine) BMD using dual x-ray absorptiometry may be considered **MEDICALLY NECESSARY** at an interval of not more frequent than every 1-2 years in individuals:

- With a baseline evaluation of osteopenia (BMD T- score -1.0 to -2.5)
- Adults with a pathologic condition associated with low bone mass or increased bone loss;
- Adults taking a medication associated with increased bone loss.

Repeat measure of central (hip/spine) BMD using dual x-ray absorptiometry may be considered **MEDICALLY NECESSARY** at an interval not more frequent than every 1-3 years in individuals who are receiving pharmacologic treatment for osteoporosis when the information will affect treatment decisions (continuation, change in drug therapy, cessation or resumption of drug therapy).

Peripheral (lower arm, wrist, finger or heel) BMD testing may be considered **MEDICALLY NECESSARY** when conventional central (hip/spine) DXA screening is not feasible or in the management of hyperparathyroidism, where peripheral DXA at the forearm (ie, radius) is essential for evaluation.

BMD measurement using ultrasound densitometry is considered **INVESTIGATIONAL**.

BMD measurement using quantitative computed tomography, or dual x-ray absorptiometry of peripheral sites is considered **INVESTIGATIONAL** except as noted above.

Medicare HMO BlueSM and Medicare PPO BlueSM Members

There is no national coverage determination for bone mass measurements (BMMs). Conditions for coverage of bone mass measurements are now contained in chapter 15, section 80.5 of Pub. 100-02, Medicare Benefit Policy Manual. Please refer to this document for coverage information.

Medicare Benefit Policy Manual - Pub 100-02 Medicare Benefit Policy:

<http://www.cms.gov/Regulations-and-Guidance/Guidance/Transmittals/downloads/R70BP.pdf>

CPT code 0508T (Pulse-echo ultrasound bone density measurement resulting in indicator of axial bone mineral density, tibia) is not a covered service.

Medical necessity criteria and coding guidance for **Medicare Advantage members living in Massachusetts** can be found through the link below.

[Local Coverage Determinations \(LCDs\) for National Government Services, Inc.](#)

Local Coverage Determination (LCD): Category III CPT® Codes (L33392) (A56195)

Note: To review the specific LCD, please remember to click “accept” on the CMS licensing agreement at the bottom of the CMS webpage.

For medical necessity criteria and coding guidance for **Medicare Advantage members living outside of Massachusetts**, please see the Centers for Medicare and Medicaid Services website at <https://www.cms.gov> for information regarding your specific jurisdiction.

Prior Authorization Information

Inpatient

- For services described in this policy, precertification/preauthorization **IS REQUIRED** for all products if the procedure is performed **inpatient**.

Outpatient

- For services described in this policy, see below for products where prior authorization **might be required** if the procedure is performed **outpatient**.

	Outpatient
Commercial Managed Care (HMO and POS)	Prior authorization is not required .
Commercial PPO and Indemnity	Prior authorization is not required .
Medicare HMO Blue SM	Prior authorization is not required .
Medicare PPO Blue SM	Prior authorization is not required .

CPT Codes / HCPCS Codes / ICD Codes

Inclusion or exclusion of a code does not constitute or imply member coverage or provider reimbursement. Please refer to the member’s contract benefits in effect at the time of service to determine coverage or non-coverage as it applies to an individual member.

Providers should report all services using the most up-to-date industry-standard procedure, revenue, and diagnosis codes, including modifiers where applicable.

The following codes are included below for informational purposes only; this is not an all-inclusive list.

The above **medical necessity criteria MUST be met for the following codes to be covered for Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity:**

CPT Codes

CPT Codes	Code Description
77080	Dual-energy x-ray absorptiometry (DXA) bone density study, 1 or more sites; axial skeleton (e.g., hips, pelvis, spine)
77081	Dual-energy x-ray absorptiometry (DXA) bone density study, 1 or more sites; appendicular skeleton (peripheral) (e.g., radius, wrist, heel)

The following CPT codes are considered investigational for **Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity:**

CPT Codes

CPT Codes	Code Description
0508T	Pulse-echo ultrasound bone density measurement resulting in indicator of axial bone mineral density, tibia
76977	Ultrasound bone density measurement and interpretation, peripheral site(s), any method

Description

Osteoporosis

Osteoporosis is determined using the World Health Organization diagnostic thresholds for osteoporosis based on bone mineral density measurement (BMD) compared with a calculated T-score.

Risk factors for fracture include low bone mass, low bone strength, a personal history of fracture as an adult, or a history of fracture in a first-degree relative. Osteoporosis, defined as low bone mass leading to an increased risk of fragility fractures, is an extremely common disease in the elderly population due to age-related bone loss in both sexes and menopause-related bone loss in women. The World Health Organization has diagnostic thresholds for osteoporosis based on BMD measurements compared with a T-score, which is the standard deviation difference between an individual's BMD and that of a young adult reference population. Conditions that can cause or contribute to osteoporosis include lifestyle factors such as low intake of calcium, high intake of alcohol or cigarette smoking, and thinness. Other risk factors for osteoporosis include certain endocrine, hematologic, gastrointestinal tract and genetic disorders, hypogonadal states, and medications.

BMD can be measured either centrally (ie, hip or spine) or peripherally (ie, wrist, finger, heel) sites. While BMD measurements are predictive of fragility fractures at all sites, central measurements of the hip and spine are the most predictive. Fractures of the hip and spine (ie, vertebral fractures) are also considered to be the most clinically relevant. BMD is typically expressed as a T-score.

The utility of screening BMD measurements can be established by demonstrating that screening identifies a population at increased risk of fracture and that, by treating those at-risk individuals, the rate of fractures is reduced thereby lowering fracture-related morbidity and mortality. These potential benefits of screening should outweigh the risks of screening (radiation exposure) or false positives (initiation of unnecessary treatment).

Bone Mineral Density

The decision to perform a bone density assessment should be based on an individual's fracture risk profile and skeletal health assessment. In addition to age, sex, and BMD, risk factors included in the World Health Organization Fracture Risk Assessment Tool¹ are:

- Low body mass index;
- Parental history of hip fracture;
- Previous fragility fracture in adult life (ie, occurring spontaneously or a fracture arising from trauma, which, in a healthy individual, would not have resulted in a fracture);
- Current smoking or 3 or more units of alcohol daily, where a unit is equivalent to a standard glass of beer (285 mL), a single measure of spirits (30 mL), a medium-sized glass of wine (120 mL), or 1 measure of an aperitif (60 mL);
- A disorder strongly associated with osteoporosis, which includes rheumatoid arthritis, type I (insulin-dependent) diabetes, osteogenesis imperfecta in adults, untreated long-standing hyperthyroidism, hypogonadism or premature menopause (<45 years), chronic malnutrition or malabsorption, and chronic liver disease;
- Current exposure to oral glucocorticoids or exposure to oral glucocorticoids for more than 3 months at a dose of prednisolone 5 mg daily or more (or equivalent doses of other glucocorticoids).

Dual x-ray absorptiometry (DXA) is the most commonly used technique to measure BMD because of its ease of use, low radiation exposure, and its ability to measure BMD at both the hip and spine. DXA generates 2 x-ray beams of different energy levels to scan the region of interest and measures the difference in attenuation as the low- and high-energy beams pass through the bone and soft tissue. The low-energy beam is preferentially attenuated by bone, while the high-energy beam is attenuated by both bone and soft tissue. This difference in attenuation between the 2 beams allows for correction for the irregular masses of soft tissue, which surrounds the spine and hip, and therefore the measurement of bone density at those sites.

A T-score is the standard deviation difference between an individual's BMD and that of a young adult reference population.

Table 1. WHO Classification of Bone Mineral Density T-Scores

Assessment	BMD Definition
Normal	Bone density is within 1 SD (+1 or -1) of the young adult mean.

Osteopenia (low bone mass)	Bone density is between 1 and 2.5 SD below the young adult mean (-1 to -2.5 SD).
Osteoporosis	Bone density is 2.5 SD or more below the young adult mean (-2.5 SD or lower).
Severe (established) osteoporosis	Bone density is more than 2.5 SD below the young adult mean, and there have been one or more osteoporotic fractures.

BMD: bone mineral density; SD: standard deviation; WHO: World Health Organization.

Other Measurement Tools

Available diagnostic tools use either X-rays or ultrasound. X-ray based methods measure BMD. However, studies suggest that in addition to measuring structural aspects of the bone by assessing BMD, other mechanical features and elastic properties of the bone are also important to predict the risk of fractures. X-ray based methods cannot assess these properties and therefore use of alternative methodologies such as ultrasound densitometry and quantitative computed tomography (CT) have been explored.

Quantitative Computed Tomography

Quantitative CT depends on the differential absorption of ionizing radiation by calcified tissue and is used for central measurements only. Compared with DXA, quantitative CT is less readily available and associated with relatively high radiation exposure and relatively high cost. Analysis of previously obtained clinical CT scans of the pelvis might provide an alternative method of assessing biomechanical bone strength.

Ultrasound Densitometry

Ultrasound densitometry is a technique for measuring BMD at peripheral sites, typically the heel but also the tibia and phalanges. Compared with osteoporotic bone, normal bone demonstrates higher attenuation of the ultrasound wave and is associated with a greater velocity of the wave passing through bone. Ultrasound densitometry has no radiation exposure, and machines may be purchased for use in an office setting.

Single- and dual-photon absorptiometry and radiographic absorptiometry are now rarely used and may be considered obsolete.

Note: Vertebral fracture assessment with DXA is addressed in policy #449.

Osteoporosis Treatment

Treatment of osteoporosis includes both lifestyle measures (eg, increased intake of calcium and vitamin D, exercise, smoking cessation) and pharmacologic measures. Current pharmacologic options include bisphosphonates such as alendronate (ie, Fosamax), selective estrogen receptor modulators such as raloxifene (ie, Evista), the recombinant human parathyroid hormone teriparatide (ie, Forteo), and calcitonin. An updated 2014 systematic review funded by the Agency for Healthcare Research and Quality found good-quality evidence that bisphosphonates, denosumab, teriparatide, and raloxifene reduce fracture risk in postmenopausal women with BMD in the osteoporotic range and/or preexisting hip or vertebral fracture.²

Summary

Bone mineral density (BMD) studies can be used to identify individuals with osteoporosis and monitor response to osteoporosis treatment, with the goal of reducing the risk of fracture. Bone density is most commonly evaluated with dual x-ray absorptiometry (DXA); other technologies are available.

For individuals who are eligible for screening of BMD based on risk factor assessment who receive DXA analysis of central sites (hip or spine), the evidence includes systematic reviews of RCTs controlled trials and cohort studies. Relevant outcomes are morbid events, functional outcomes, quality of life (QOL), hospitalizations, and medication use. Central DXA is the most widely accepted method for measuring BMD and is the reference standard against which other screening tests are evaluated. BMD measurements with central DXA identify individuals at increased risk of fracture, and osteoporosis

medications reduce fracture risk in the population identified as osteoporotic by central DXA. Therefore, test results with initial central DXA can be used to guide therapy. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals without osteoporosis on initial screen who receive repeat DXA analysis of central sites (hip or spine), the evidence includes systematic reviews of large cohort and observational studies. Relevant outcomes are morbid events, functional outcomes, QOL, hospitalizations, and medication use. Little research has been done on the frequency of BMD monitoring for osteoporosis. The available research has evaluated repeat measurement with central DXA. Evidence on whether repeat measurements add to risk prediction compared with a single measurement is mixed. Although the optimal interval may differ depending on risk factors, current evidence does not support repeat monitoring in patients with BMD on DXA in the normal range. The evidence is insufficient to determine the effects of the technology on health outcomes. Although the evidence is limited, multiple clinical practice guidelines recommend repeat DXA in 3-5 years in patients at low-risk using risk factor assessment. Similarly, multiple guidelines recommend a repeat screening interval of 1-2 years for high-risk individuals and in individuals with a baseline evaluation near a fracture intervention threshold (osteopenia).

For individuals who are receiving pharmacologic treatment for osteoporosis who receive repeat DXA analysis of central sites (hip or spine), the evidence includes systematic reviews of RCTs and observational studies. Relevant outcomes are morbid events, functional outcomes, QOL, hospitalizations, and medication use. There is no high-quality evidence to guide how often to monitor BMD during osteoporosis treatment. Within-person variation in measurement may exceed treatment effects, and fracture risk has been shown to be reduced in some treatment studies in the absence of changes in BMD. Together, these results suggest that frequent (ie, every 2 years) repeat monitoring has low value. It is unclear whether DXA at the end of the initial 5 years of therapy is sufficiently accurate to guide subsequent therapy. The evidence is insufficient to determine the effects of the technology on health outcomes. Although the evidence is limited, multiple clinical practice guidelines recommend repeat DXA at intervals of 1-3 years to monitor treatment response in patients who are receiving pharmacological treatment for osteoporosis or after a change in or cessation of treatment.

For individuals who are eligible for screening of BMD based on risk factor assessment who receive ultrasound densitometry, or quantitative computed tomography, or DXA analysis of peripheral sites, the evidence includes observational studies and systematic reviews. Relevant outcomes are morbid events, functional outcomes, QOL, hospitalizations, and medication use. In comparison with central DXA, other measures of bone health showed area under the curves around 0.80 for the identification of osteoporosis. These technologies are not commonly used for BMD measurements in practice, and no studies have shown that they can select patients who benefit from treatment for osteoporosis. There is little to no evidence on the usefulness of repeat measurement of BMD using these techniques. The evidence is insufficient to determine the effects of the technology on health outcomes.

Policy History

Date	Action
6/2020	BCBSA National medical policy review. Policy statements revised to add specific information on risk factors and to indicate that more frequent monitoring (1-2 years in asymptomatic individuals and 1-3 years to monitor treatment) may be medically necessary depending on risk factors. For clarification, the last investigational statement was separated into two statements. Effective 6/1/2020.
2/2019	BCBSA National medical policy review. Description, summary and references updated. Policy statements unchanged.
7/2018	Clarified coding information.
8/2017	BCBSA National medical policy review. New medically necessary and investigational indications described. Policy statements edited to clarify that central dual x-ray absorptiometry (DXA) is medically necessary and other methods of measurement are investigational. Clarified coding information. Effective 8/1/2017.
1/2016	Added coding language.

5/2015	New references added from BCBSA National medical policy.
5/2014	New references from BCBSA National medical policy.
5/2013	New references from BCBSA National medical policy.
11/2011-4/2012	Medical policy ICD 10 remediation: Formatting, editing and coding updates. No changes to policy statements.
10/2011	Updated to reflect coverage in accordance with National Health Care Reform.
9/2011	Reviewed - Medical Policy Group - Urology and Obstetrics/Gynecology. No changes to policy statements.
1/2011	BCBSA National medical policy review. No changes to policy statements.
10/2010	Reviewed - Medical Policy Group - Urology and Obstetrics/Gynecology. No changes to policy statements.
11/2009	BCBSA National medical policy review. Changes to policy statements.
10/2009	Reviewed - Medical Policy Group - Urology and Obstetrics/Gynecology. No changes to policy statements.
10/2008	Reviewed - Medical Policy Group - Urology and Obstetrics/Gynecology. No changes to policy statements.
10/2007	Reviewed - Medical Policy Group - Urology and Obstetrics/Gynecology. No changes to policy statements.
8/2007	BCBSA National medical policy review. No changes to policy statements.

Information Pertaining to All Blue Cross Blue Shield Medical Policies

Click on any of the following terms to access the relevant information:

[Medical Policy Terms of Use](#)

[Managed Care Guidelines](#)

[Indemnity/PPO Guidelines](#)

[Clinical Exception Process](#)

[Medical Technology Assessment Guidelines](#)

References

1. World Health Organization (WHO). FRAX: Fracture Risk Assessment Tool. n.d.; <http://www.shef.ac.uk/FRAX/tool.jsp>. Accessed January 2, 2020.
2. Crandall CJ, Newberry SJ, Diamant A, et al. Comparative effectiveness of pharmacologic treatments to prevent fractures: an updated systematic review. *Ann Intern Med*. Nov 18 2014;161(10):711-723. PMID 25199883
3. National Osteoporosis Foundation. Osteoporosis: review of the evidence for prevention, diagnosis and treatment and cost-effectiveness analysis. Introduction. *Osteoporos Int*. 1998;8 Suppl 4(suppl 4):S7-80. PMID 10197173
4. Blue Cross and Blue Shield Association Technology Evaluation Center (TEC). Ultrasonography of the heel for diagnosing osteoporosis and selecting patients for pharmacologic treatment. *TEC Assessments*. 1999;Volume 14:Tab 19.
5. Blue Cross and Blue Shield Association Technology Evaluation Center (TEC). Ultrasonography of peripheral sites for diagnosing and selecting patients for pharmacologic treatment for osteoporosis. *TEC Assessments*. 2002;Volume 17:Tab 5.
6. U.S. Preventive Services Task Force (USPSTF). Osteoporosis: Screening to Prevent Fractures. 2018; <http://www.uspreventiveservicestaskforce.org/uspstf/uspstfoste.htm>. Accessed January 2, 2020.
7. Camacho PM, Petak SM, Binkley N, et al. American Association of Clinical Endocrinologists and American College of Endocrinology Clinical Practice Guidelines for the Diagnosis and Treatment of Postmenopausal Osteoporosis - 2016. *Endocr Pract*. Sep 02 2016;22(Suppl 4):1-42. PMID 27662240
8. Watts NB, Adler RA, Bilezikian JP, et al. Osteoporosis in men: an Endocrine Society clinical practice guideline. *J. Clin. Endocrinol. Metab.*, 2012 Jun 8;97(6). PMID 22675062
9. Hillier TA, Stone KL, Bauer DC, et al. Evaluating the value of repeat bone mineral density measurement and prediction of fractures in older women: the study of osteoporotic fractures. *Arch Intern Med*. Jan 22 2007;167(2):155-160. PMID 17242316
10. Berry SD, Samelson EJ, Pencina MJ, et al. Repeat bone mineral density screening and prediction of hip and major osteoporotic fracture. *JAMA*. Sep 25 2013;310(12):1256-1262. PMID 24065012

11. Frost SA, Nguyen ND, Center JR, et al. Timing of repeat BMD measurements: development of an absolute risk-based prognostic model. *J Bone Miner Res.* Nov 2009;24(11):1800-1807. PMID 19419321
12. Gourlay ML, Fine JP, Preisser JS, et al. Bone-density testing interval and transition to osteoporosis in older women. *N Engl J Med.* Jan 19 2012;366(3):225-233. PMID 22256806
13. Gourlay ML, Overman RA, Ensrud KE. Bone Density Screening and Re-screening in Postmenopausal Women and Older Men. *Current osteoporosis reports.* Dec 2015;13(6):390-398. PMID 26408154
14. Qaseem A, Snow V, Shekelle P, et al. Screening for osteoporosis in men: a clinical practice guideline from the American College of Physicians. *Ann Intern Med.* May 06 2008;148(9):680-684. PMID 18458281
15. Agency for Healthcare Research and Quality. Treatment To Prevent Fractures in Men and Women With Low Bone Density or Osteoporosis: Update of a 2007 Report. 2012; https://effectivehealthcare.ahrq.gov/sites/default/files/pdf/osteoporosis-bone-fracture_research.pdf. Accessed January 2, 2020.
16. Bell KJ, Hayen A, Macaskill P, et al. Value of routine monitoring of bone mineral density after starting bisphosphonate treatment: secondary analysis of trial data. *BMJ.* 2009;338:b2266. PMID 19549996
17. Eastell R, Rosen CJ, Black DM, et al. Pharmacological Management of Osteoporosis in Postmenopausal Women: An Endocrine Society* Clinical Practice Guideline. *J. Clin. Endocrinol. Metab.,* 2019 Mar 26;104(5). PMID 30907953
18. Adams AL, Fischer H, Kopperdahl DL, et al. Osteoporosis and Hip Fracture Risk from Routine Computed Tomography Scans: The Fracture, Osteoporosis, and CT Utilization Study (FOCUS). *J Bone Miner Res.* Jul 2018;33(7):1291-1301. PMID 29665068
19. American College of Obstetricians and Gynecologists (ACOG) Committee on Practice Bulletins. Osteoporosis (Practice Bulletin N. 129). *Obstet Gynecol.* Sep 2012, reaffirmed 2014;120(3):718-734. PMID 22914492
20. Adler RA, El-Hajj Fuleihan G, Bauer DC, et al. Managing Osteoporosis in Patients on Long-Term Bisphosphonate Treatment: Report of a Task Force of the American Society for Bone and Mineral Research. *J. Bone Miner. Res.,* 2016 Oct 21;31(10). PMID 27759931
21. National Osteoporosis Foundation. Clinician's guide to prevention and treatment of osteoporosis. 2014; <https://my.nof.org/file/bonesource/Clinicians-Guide.pdf>. Accessed January 2, 2020.
22. Expert Panel on Musculoskeletal I, Ward RJ, Roberts CC, et al. ACR Appropriateness Criteria((R)) Osteoporosis and Bone Mineral Density. *J Am Coll Radiol.* May 2017;14(5S): S189-S202. PMID 28473075
23. International Society for Clinical Densitometry. 2013 ISCD Official Positions-Adult 2013; <http://www.iscd.org/official-positions/2013-iscd-official-positions-adult/>. Accessed January 2, 2020.
24. Centers for Medicare & Medicaid Services (CMS). National Coverage Determination for Bone (Mineral) Density Studies (150.3). 2007; <http://www.cms.gov/Regulations-and-Guidance/Guidance/Transmittals/downloads/R70BP.pdf>. Accessed January 2, 2020.