

Medical Coverage Policy | Vertebral Fracture Assessment or Biomechanical Computed Tomography



EFFECTIVE DATE: 10|01|2015

POLICY LAST REVIEWED: 09|16|2025

OVERVIEW

Vertebral fracture assessment (VFA) with densitometry is a technique to assess vertebral fractures at the same time as bone mineral density, using additional software with dual-energy x-ray absorptiometry. The addition of VFA to bone mineral density may augment diagnostic information on fracture risk. Another method of determining vertebral fracture risk is biomechanical computed tomography (BCT), which evaluates both bone density and strength.

This policy addresses vertebral fracture assessment **without** densitometry.

MEDICAL CRITERIA

Not applicable

PRIOR AUTHORIZATION

Not applicable

POLICY STATEMENT

Medicare Advantage Plans

Screening for vertebral fractures using dual-energy X-ray absorptiometry (DXA or DEXA), **without bone density study**, is covered, but not separately reimbursed.

Commercial Products

Screening for vertebral fractures using dual-energy X-ray absorptiometry (DXA or DEXA) or biomechanical computed tomography, **without bone density study**, is considered not medically necessary as the evidence is insufficient to determine the effects of the technology on health outcomes.

COVERAGE

Benefits may vary between groups and contracts. Please refer to the appropriate Benefit Booklet, Evidence of Coverage or Subscriber Agreement for not medically necessary benefits/coverage.

BACKGROUND

Vertebral Fractures

Vertebral fractures are highly prevalent in the elderly population, and epidemiologic studies have found that these fractures are associated with an increased risk of future spine or hip fractures independent of bone mineral density.

Diagnosis

Only 20% to 30% of vertebral fractures are recognized clinically; the rest are discovered incidentally on lateral spine radiographs. Lateral spine radiographs have not been recommended as a component of risk assessment for osteoporosis because of the cost, radiation exposure, and the fact that the radiograph would require a separate procedure in addition to the bone mineral density study using dual-energy x-ray absorptiometry. However, several densitometers with specialized software can perform VFA in conjunction with dual-energy x-ray absorptiometry. The lateral spine scan is performed by using a rotating arm; depending on the densitometer used, the patient can either stay in the supine position after the bone density study or is required to move onto the left decubitus position.

VFA differs from radiologic detection of fractures because VFA uses a lower radiation exposure and can detect only fractures, while traditional radiograph images can detect other bone and soft tissue abnormalities in addition to spinal fractures. Manufacturers have also referred to this procedure as instant vertebral assessment, radiographic vertebral assessment, dual-energy vertebral assessment, or lateral vertebral assessment.

For both lateral spine radiographs and images with densitometry, vertebral fractures are assessed visually. While a number of grading systems have been proposed, the Genant semiquantitative method is commonly used. This system grades the deformities from I to III, with grade I (mild) representing a 20% to 24% reduction in vertebral height, grade II (moderate) representing a 25% to 39% reduction in height, and grade III (severe) representing a 40% or greater reduction in height. The location of the deformity within the vertebrae may also be noted. For example, if only the mid height of the vertebrae is affected, the deformity is defined as an endplate deformity; if both the anterior and mid heights are deformed, it is a wedge deformity; and if the entire vertebrae is deformed, it is classed as a crush deformity. A vertebral deformity of at least 20% loss in height is typically considered a fracture. Accurate interpretation of both lateral spine radiographs and VFA imaging is dependent on radiologic training. Thus, device location and availability of appropriately trained personnel may influence diagnostic accuracy.

Biomechanical computed tomography (BCT) is another method of performing VFA which also minimizes radiation exposure.² Previously obtained CT scans can be used for BCT analysis in many cases. Exceptions include spinal images performed with contrast and images in which metal is present in the transverse plane of the bone of interest. Analysis is performed in a centralized laboratory, to which clinicians must send CT scans. The BCT calculation involves a non-linear finite element analysis to simulate a fracture event, with outputs including T-score and Z-score of the femoral neck and hip, femoral strength, vertebral strength, vertebral trabecular volume, and vertebral Z-score. Patients are classified as high risk if fragile bone strength (defined as ≤ 3000 to 6500 Newtons depending on patient sex and location [hip or spine]) or osteoporosis at the hip or spine is found. The classification of increased risk is assigned if low bone strength or low bone mass is identified at the hip or spine.

For individuals who are at risk of having vertebral fractures but are not known to have them who receive VFA with densitometry by dual-energy x-ray absorptiometry, the evidence includes diagnostic accuracy studies and subgroup reanalyses of treatment studies. Relevant outcomes are test accuracy, test validity, and morbid events. There is a lack of direct evidence from screening trials that use densitometry with and without VFA improves health outcomes. Because direct evidence was not available, a chain of evidence was sought. Evidence was examined on the diagnostic accuracy of VFA in nonosteoporotic patients (ie, those not already eligible for treatment), the ability of VFA to identify patients for treatment who would not otherwise be identified, and the effectiveness of treatment in this population. Diagnostic accuracy studies have reported variable findings; recent studies have suggested higher diagnostic accuracy of VFA overall compared with standard radiographs than older studies. Studies have found that VFA can identify patients without osteoporosis who may be appropriate candidates for treatment according to recommendations from the National Osteoporosis Foundation. However, there is limited evidence on the effectiveness of treatment in this population. No treatment data have been published on patients whose vertebral fracture had been identified using VFA software with densitometry. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who are at risk of having vertebral fractures but are not known to have them who receive VFA with biomechanical computed tomography (BCT), the evidence includes retrospective studies. Relevant outcomes are test accuracy, test validity, and morbid events. The available studies have demonstrated that BCT has similar efficacy to DXA in detecting osteoporosis. There is a lack of direct evidence from clinical trials that the use of BCT for VFA improves health outcomes. No treatment data have been published on patients whose vertebral fractures were identified using BCT. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

CODING

Medicare Advantage Plans and Commercial Products

The following CPT code(s) is covered, but not separately reimbursed for Medicare Advantage Plans and is not medically necessary for Commercial Products:

77086 Vertebral fracture assessment via dual-energy X-ray absorptiometry (DXA)

RELATED POLICIES

Bone Mineral Density Studies

Non-Reimbursable Health Service Codes

PUBLISHED

Provider Update, November, 2025

Provider Update, January 2025

Provider Update, January 2024

Provider Update, January 2023

Provider Update, December 2021

REFERENCES

1. Alsoof D, Anderson G, McDonald CL, et al. Diagnosis and Management of Vertebral Compression Fracture. *Am J Med.* Jul 2022; 135(7): 815-821. PMID 35307360
2. Keaveny TM, Clarke BL, Cosman F, et al. Biomechanical Computed Tomography analysis (BCT) for clinical assessment of osteoporosis. *Osteoporos Int.* Jun 2020; 31(6): 1025-1048. PMID 32335687
3. Malgo F, Hamdy NAT, Ticheler CHJM, et al. Value and potential limitations of vertebral fracture assessment (VFA) compared to conventional spine radiography: experience from a fracture liaison service (FLS) and a meta-analysis. *Osteoporos Int.* Oct 2017; 28(10): 2955-2965. PMID 28842721
4. Lee JH, Lee YK, Oh SH, et al. A systematic review of diagnostic accuracy of vertebral fracture assessment (VFA) in postmenopausal women and elderly men. *Osteoporos Int.* May 2016; 27(5): 1691-9. PMID 26782682
5. Domiciano DS, Figueiredo CP, Lopes JB, et al. Vertebral fracture assessment by dual X-ray absorptiometry: a valid tool to detect vertebral fractures in community-dwelling older adults in a population-based survey. *Arthritis Care Res (Hoboken).* May 2013; 65(5): 809-15. PMID 23212896
6. Ferrar L, Jiang G, Clowes JA, et al. Comparison of densitometric and radiographic vertebral fracture assessment using the algorithm-based qualitative (ABQ) method in postmenopausal women at low and high risk of fracture. *J Bone Miner Res.* Jan 2008; 23(1): 103-11. PMID 17892377
7. Binkley N, Krueger D, Gangnon R, et al. Lateral vertebral assessment: a valuable technique to detect clinically significant vertebral fractures. *Osteoporos Int.* Dec 2005; 16(12): 1513-8. PMID 15834512
8. LeBoff MS, Greenspan SL, Insogna KL, et al. The clinician's guide to prevention and treatment of osteoporosis. *Osteoporos Int.* Oct 2022; 33(10): 2049-2102. PMID 35478046
9. Gill SM, Hassan A. Routine Use of Lateral Vertebral Assessment With DXA Scan for Detection of Silent But Debilitating Vertebral Fractures. *Clin Nucl Med.* Feb 01 2023; 48(2): 107-111. PMID 36607360
10. Yang J, Mao Y, Nieves JW. Identification of prevalent vertebral fractures using Vertebral Fracture Assessment (VFA) in asymptomatic postmenopausal women: A systematic review and meta-analysis. *Bone.* Jul 2020; 136: 115358. PMID 32268210
11. Kanterewicz E, Puigoriol E, García-Barrionuevo J, et al. Prevalence of vertebral fractures and minor vertebral deformities evaluated by DXA-assisted vertebral fracture assessment (VFA) in a population-based study of postmenopausal women: the FRODOS study. *Osteoporos Int.* May 2014; 25(5): 1455-64. PMID 24599272
12. Mrgan M, Mohammed A, Gram J. Combined vertebral assessment and bone densitometry increases the prevalence and severity of osteoporosis in patients referred to DXA scanning. *J Clin Densitom.* 2013; 16(4): 549-53. PMID 23769657
13. El Maghraoui A, Mounach A, Rezqi A, et al. Vertebral fracture assessment in asymptomatic men and its impact on management. *Bone.* Apr 2012; 50(4): 853-7. PMID 22240446

14. El Maghraoui A, Rezqi A, Mounach A, et al. Systematic vertebral fracture assessment in asymptomatic postmenopausal women. *Bone*. Jan 2013; 52(1): 176-80. PMID 23017663
15. Jager PL, Jonkman S, Koolhaas W, et al. Combined vertebral fracture assessment and bone mineral density measurement: a new standard in the diagnosis of osteoporosis in academic populations. *Osteoporos Int*. Apr 2011; 22(4): 1059-68. PMID 20571773
16. Cummings SR, Black DM, Thompson DE, et al. Effect of alendronate on risk of fracture in women with low bone density but without vertebral fractures: results from the Fracture Intervention Trial. *JAMA*. Dec 1998; 280(24): 2077-82. PMID 9875874
17. Quandt SA, Thompson DE, Schneider DL, et al. Effect of alendronate on vertebral fracture risk in women with bone mineral density T scores of -1.6 to -2.5 at the femoral neck: the Fracture Intervention Trial. *Mayo Clin Proc*. Mar 2005; 80(3): 343-9. PMID 15757015
18. Kanis JA, Barton IP, Johnell O. Risedronate decreases fracture risk in patients selected solely on the basis of prior vertebral fracture. *Osteoporos Int*. May 2005; 16(5): 475-82. PMID 15875093
19. Bhoopalam N, Campbell SC, Moritz T, et al. Intravenous zoledronic acid to prevent osteoporosis in a veteran population with multiple risk factors for bone loss on androgen deprivation therapy. *J Urol*. Nov 2009; 182(5): 2257-64. PMID 19758618
20. Greenspan SL, Nelson JB, Trump DL, et al. Effect of once-weekly oral alendronate on bone loss in men receiving androgen deprivation therapy for prostate cancer: a randomized trial. *Ann Intern Med*. Mar 20 2007; 146(6): 416-24. PMID 17371886
21. Izzy M, Addissie BD, Arab JP, et al. Triple-Phase Computed Tomography May Replace Dual-Energy X-ray Absorptiometry Scan for Evaluation of Osteoporosis in Liver Transplant Candidates. *Liver Transpl*. Feb 2021; 27(3): 341-348. PMID 33098253
22. 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
23. Fidler JL, Murthy NS, Khosla S, et al. Comprehensive Assessment of Osteoporosis and Bone Fragility with CT Colonography. *Radiology*. Jan 2016; 278(1): 172-80. PMID 26200602
24. Weber NK, Fidler JL, Keaveny TM, et al. Validation of a CT-derived method for osteoporosis screening in IBD patients undergoing contrast-enhanced CT enterography. *Am J Gastroenterol*. Mar 2014; 109(3): 401-8. PMID 24445572
25. 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
26. Camacho PM, Petak SM, Binkley N, et al. AMERICAN ASSOCIATION OF CLINICAL ENDOCRINOLOGISTS/AMERICAN COLLEGE OF ENDOCRINOLOGY CLINICAL PRACTICE GUIDELINES FOR THE DIAGNOSIS AND TREATMENT OF POSTMENOPAUSAL OSTEOPOROSIS-2020 UPDATE. *Endocr Pract*. May 2020; 26(Suppl 1): 1-46. PMID 32427503
27. Qaseem A, Forciea MA, McLean RM, et al. Treatment of Low Bone Density or Osteoporosis to Prevent Fractures in Men and Women: A Clinical Practice Guideline Update From the American College of Physicians. *Ann Intern Med*. Jun 06 2017; 166(11): 818-839. PMID 28492856
28. American College of Radiology. ACR Appropriateness Criteria, Osteoporosis and Bone Mineral Density. 2022; <https://acsearch.acr.org/docs/69358/Narrative/>. Accessed July 19, 2025.
29. International Society for Clinical Densitometry. 2023 ISCD Official Positions Adult. 2023; <https://iscd.org/official-positions-2023/>. Accessed July 19, 2025.
30. 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*. May 2019; 104(5):1595-1622.
31. Management of osteoporosis in postmenopausal women: the 2021 position statement of The North American Menopause Society. *Menopause*. Sep 01 2021; 28(9): 973-997. PMID 34448749

32. Nicholson WK, Silverstein M, Wong JB, et al. Screening for Osteoporosis to Prevent Fractures: US Preventive Services Task Force Recommendation Statement. JAMA. Feb 11 2025; 333(6): 498-508. PMID 39808425

[CLICK THE ENVELOPE ICON BELOW TO SUBMIT COMMENTS](#)

This medical policy is made available to you for informational purposes only. It is not a guarantee of payment or a substitute for your medical judgment in the treatment of your patients. Benefits and eligibility are determined by the member's subscriber agreement or member certificate and/or the employer agreement, and those documents will supersede the provisions of this medical policy. For information on member-specific benefits, call the provider call center. If you provide services to a member which are determined to not be medically necessary (or in some cases medically necessary services which are non-covered benefits), you may not charge the member for the services unless you have informed the member and they have agreed in writing in advance to continue with the treatment at their own expense. Please refer to your participation agreement(s) for the applicable provisions. This policy is current at the time of publication; however, medical practices, technology, and knowledge are constantly changing. BCBSRI reserves the right to review and revise this policy for any reason and at any time, with or without notice. Blue Cross & Blue Shield of Rhode Island is an independent licensee of the Blue Cross and Blue Shield Association.

