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Subject: Percutaneous Vertebroplasty, Kyphoplasty, and Sacroplasty

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Position Statement	Billing/Coding	Reimbursement	Program Exceptions	Definitions	Related Guidelines
Other	References	Updates			

DESCRIPTION:

Percutaneous vertebroplasty is an interventional technique involving the fluoroscopically guided injection of polymethylmethacrylate into a weakened vertebral body. The technique has been investigated to provide mechanical support and symptomatic relief in those with osteoporotic vertebral compression fractures or those with osteolytic lesions of the spine (eg, multiple myeloma, metastatic malignancies); as a treatment for sacral insufficiency fractures; and as a technique to limit blood loss related to surgery.

Percutaneous balloon kyphoplasty, radiofrequency kyphoplasty (RFK), and mechanical vertebral augmentation are interventional techniques involving the fluoroscopically guided injection of polymethylmethacrylate into a cavity created in the vertebra l body with a balloon or mechanical device.

Sacroplasty evolved from the treatment of insufficiency fractures in the thoracic and lumbar vertebrae with vertebroplasty. The procedure, essentially identical, entails guided injection of PMMA through a needle inserted into the fracture zone. It is most often described as a minimally invasive procedure employed as an alternative to conservative management for sacral insufficiency fractures (SIFs).

Summary and Analysis of Evidence: UpToDate review “Osteoporotic thoracolumbar vertebral compression fractures: Clinical manifestations and treatment (Rosen, 2024) states “(p)atients with severe pain from an acute (0 to 4 weeks) vertebral body fracture typically require opioids at the outset. When opioids are required to control pain from vertebral compression fractures, we typically initiate treatment with an immediate-release opioid combined with low-dose acetaminophen. If the pain is

incapacitating, hospital admission and parenteral analgesia for pain management may be necessary. For patients with incapacitating pain from acute and subacute vertebral compression fractures who are unable to taper parenteral or transition to oral opioids within seven days of admission or have intolerable sedation, constipation, or delirium from this therapy, we suggest vertebral augmentation rather than continued medical management (Grade 2C). This is typically performed during the initial hospitalization. Vertebroplasty and kyphoplasty appear to perform similarly. Vertebroplasty is performed when there is little to no compression of the vertebral body, but MRI shows bone marrow edema consistent with fracture. It does not rely on the performance of a balloon system … Kyphoplasty relies on the use of a balloon tamponade system that can have technical difficulties, but it may partially restore vertebral height." UpToDate review "Overview of therapeutic approaches for adult patients with bone metastasis from solid tumors" (Yu, Hoffe; 2024) states "(a)nother option for patients with painful vertebral bone metastases with a compression fracture is percutaneous vertebral augmentation, with (vertebroplasty) or without (kyphoplasty) polymethyl methacrylate. Percutaneous vertebral augmentation has been used to improve the mechanical stability of the vertebrae as well as pain from a vertebral compression fracture. However, only one randomized study has demonstrated improved quality of life and functional outcomes; further research is thus needed. When it is performed, vertebroplasty/kyphoplasty is generally reserved for patients with symptomatic osteolytic spinal metastases, with intact bone cortex and without epidural disease, spinal cord compression, or retropulsion of bone fragments into the spinal cord. For asymptomatic patients with radiographic evidence of significant compromise of mechanical stability due to osteolytic bone metastasis or fracture, vertebral augmentation may be considered by the multidisciplinary team to prevent future symptoms due to further compression of vertebrae." Zhao et al (2017) examined the efficacy and safety of vertebroplasty, kyphoplasty, and conservative treatment for the treatment of osteoporotic vertebral compression fracture. Sixteen RCTs were identified. No significant difference was found between kyphoplasty and vertebroplasty for pain relief, daily function, and quality of life. Network meta-analysis demonstrated that kyphoplasty was superior to conservative therapy as assessed by visual analog scale, European Quality of Life-5 Dimensions, and Roland-Morris Disability Questionnaire. Kyphoplasty was associated with the lowest risk of new fractures. UpToDate review "Minor pelvic fractures (pelvic fragility fractures) in the older adult" (Fitch, 2024) states "(i)nvasive treatment for insufficiency fractures of the pelvis (eg, sacroplasty and ramoplasty) has been described but is not well studied. Indications remain unspecified, but consultation is reasonable when pain control is difficult and mobilization remains limited. These procedures are performed primarily by interventional radiologists. Most authors agree that surgical treatment is needed for fragility fractures of the pelvis (FFP) types III and IV, and for type II fractures that fail to heal with conservative treatment." Frey et al (2017) reported on patients treated with percutaneous sacroplasty, particularly the long-term efficacy of sacroplasty versus nonsurgical management. This prospective, observational cohort study spanned 10 years and comprised 240 patients with sacral insufficiency fractures. Both forms of treatment resulted in significant visual analogue scale improvement from pretreatment to the 2-year follow-up. However, the sacroplasty treatment group experienced significant visual analogue scale score improvement consistently at many of the follow-up points. Meanwhile, the group with nonsurgical treatment only experienced 1 significant pain improvement score, which was at the 2-week followup post-treatment. One major limitation of this study was that the nonsurgical treatment group was not followed up at the 10-year mark whereas the sacroplasty group did receive follow-up. Due to the limited number of patients and the retrospective nature of the evidence base, harms associated with sacroplasty have not been adequately studied. The

small numbers of treated patients leave uncertainty regarding the impact of sacroplasty on health outcomes. The authors stated "Although the clinical outcomes in our study are encouraging, this study has several limitations. First, only 18 patients were enrolled in our study; the sample size is too small to prove the feasibility and efficacy of this technique. Second, the retrospective nature of the study design lacked randomization of patients. Therefore, enrolling patients to undergo different treatment methods to compare clinical outcomes was impossible. Third, some patients had comorbidities, such as hypertension and diabetes mellitus. We did not take these comorbidities into consideration because they have no direct correlation with pedicle screws loosening. However, these comorbidities may have influenced the treatment results."

POSITION STATEMENT:

Percutaneous vertebroplasty

Percutaneous vertebroplasty **meets the definition of medical necessity** for the following indications:

- Treatment of symptomatic osteoporotic vertebral fractures that have failed to respond to conservative treatment (eg, analgesics, physical therapy, rest) for at least 6 weeks, **OR**
- Treatment of symptomatic osteoporotic vertebral fractures that are less than 6 weeks in duration that have led to hospitalization or persist at a level that prevents ambulation, **OR**
- Treatment of severe pain due to osteolytic lesions of the spine related to multiple myeloma or metastatic malignancies, **OR**
- Treatment of acute vertebral fractures due to trauma, when at least 2 weeks of conservative treatment (eg, analgesics, physical therapy, rest) has failed

Balloon kyphoplasty and mechanical vertebral augmentation

Balloon kyphoplasty or mechanical vertebral augmentation using an FDA cleared device **meets the definition of medical necessity** for the following indications:

- Treatment of symptomatic osteoporotic vertebral compression fractures that have failed to respond to conservative treatment (eg, analgesics, physical therapy, rest) for at least 6 weeks, **OR**
- Treatment of severe pain due to osteolytic lesions of the spine related to multiple myeloma or metastatic malignancies, **OR**
- Treatment of acute vertebral fractures due to trauma, when at least 2 weeks of conservative treatment (eg, analgesics, physical therapy, rest) has failed

Radiofrequency kyphoplasty

Radiofrequency kyphoplasty is considered **experimental or investigational**. Data in published medical literature are inadequate to permit scientific conclusions on long-term and net health outcomes.

Percutaneous sacroplasty

Percutaneous sacroplasty is considered **experimental or investigational** for all indications, including sacral insufficiency fractures due to osteoporosis and spinal lesions due to metastatic malignancies, or multiple myeloma. The available published clinical literature does not support clinical value.

BILLING/CODING INFORMATION:

CPT Coding:

0200T	Percutaneous sacral augmentation (sacroplasty), unilateral injection(s), including the use of a balloon or mechanical device, when used, one or more needles, includes imaging guidance and bone biopsy, when performed (**investigational**)
0201T	Percutaneous sacral augmentation (sacroplasty), bilateral injections, including the use of a balloon or mechanical device, when used, two or more needles, includes imaging guidance and bone biopsy, when performed (**investigational**)
22510	Percutaneous vertebroplasty (bone biopsy included when performed) 1 vertebral body, unilateral or bilateral injection, inclusive of all imaging guidance, cervicothoracic
22511	Percutaneous vertebroplasty (bone biopsy included when performed) 1 vertebral body, unilateral or bilateral injection, inclusive of all imaging guidance, lumbosacral
22512	Percutaneous vertebroplasty (bone biopsy included when performed) 1 vertebral body, unilateral or bilateral injection, inclusive of all imaging guidance, each additional cervicothroacic or lumbosacral, vertebral body (List separately in addition to code for primary procedure)
22513	Percutaneous vertebral augmentation, including cavity creation (fracture reduction and bone biopsy included when performed) using mechanical device (e.g., kyphoplasty), 1 vertebral body, unilateral or bilateral cannulation, inclusive of all imaging guidance; thoracic
22514	Percutaneous vertebral augmentation, including cavity creation (fracture reduction and bone biopsy included when performed) using mechanical device (e.g., kyphoplasty), 1 vertebral body, unilateral or bilateral cannulation, inclusive of all imaging guidance; lumbar
22515	Percutaneous vertebral augmentation, including cavity creation (fracture reduction and bone biopsy included when performed) using mechanical device (e.g., kyphoplasty), 1 vertebral body, unilateral or bilateral cannulation, inclusive of all imaging guidance; each additional thoracic or lumbar vertebral body (List separately in addition to code for primary procedure)

ICD-10 Diagnosis Codes That Support Medical Necessity:

C41.2	Malignant neoplasm of vertebral column
C79.51 – C79.52	Secondary malignant neoplasm of bone and bone marrow
C90.00 – C90.02	Multiple myeloma
D18.09	Hemangioma of other sites
D47.Z9	Other unspecified neoplasms of uncertain behavior of lymphoid, hematopoietic and related tissue
M48.50XA – M48.58XS	Collapsed vertebra, not elsewhere classified

M80.08XA – M80.08XS	Age-related osteoporosis with current pathological fracture, vertebra(e)
M84.48XA – M84.48XS	Pathological fracture, other site
M84.58XA – M84.58XS	Pathological fracture in neoplastic disease, vertebrae
M84.68XA – M84.68XS	Pathological fracture in other disease, other site

REIMBURSEMENT INFORMATION:

None applicable.

PROGRAM EXCEPTIONS:

Federal Employee Program (FEP): Follow FEP guidelines.

State Account Organization (SAO): Follow SAO guidelines.

Medicare Advantage products: The following Local Coverage Determinations (LCD) was reviewed on the last guideline revised date: Percutaneous Vertebral Augmentation (PVA) for Vertebral Compression Fracture (VCF) (L34976), located at cms.gov.

If this Medical Coverage Guideline contains a step therapy requirement, in compliance with Florida law 627.42393, members or providers may request a step therapy protocol exemption to this requirement if based on medical necessity. The process for requesting a protocol exemption can be found at Coverage Protocol Exemption Request.

DEFINITIONS:

No guideline specific definitions apply.

RELATED GUIDELINES:

None applicable.

OTHER:

Joline Kyphoplasty System Allevo

TRACKER Kyphoplasty System

TRACKER Plus Kyphoplasty System

Stryker iVAS Elite Inflatable Vertebral AugmentationSystem (Stryker iVAS Elite Balloon Catheter)

SpineKure Kyphoplasty System

Modified Winch Kyphoplasty (15 and 20 mm) 11 GaugeBalloon Catheters

13G InterV Kyphoplasty Catheter (Micro) and 11GInterV Kyphoplasty Catheter (Mini-Flex)

MEDINAUT Kyphoplasty System

AVAflex Vertebral Balloon System

Osseoflex SB Straight Balloon 10g/4ml Osseoflex SBStraight Balloon 10g/2ml

InterV Kyphoplasty Catheter (Balloon Length: 1015 and20mm) InterV Kyphoplasty Catheter (Mini) (BalloonLength: 10 15 and 20mm)

GUARDIAN-SG Inflatable Bone Expander System

ZVPLASTY

Kiva VCF Treatment System

SpineJack Expansion Kit

V-Strut Vertebral Implant

REFERENCES:

1. ACR-ASNR-ASSR-SIR-SNIS. Practice guideline for the performance of vertebral augmentation (2012). Accessed at http://www.acr.org/~/media/ACR/Documents/PGTS/guidelines/Vertebral_Augmentation.pdf.
2. Ahsan MK, Pandit OP, Khan MSI. Percutaneous vertebroplasty for symptomatic osteoporotic compression fractures: A single-center prospective study. Surg Neurol Int. 2021 Apr 19;12:176. doi: 10.25259/SNI_212_2021.
3. Baerlocher MO, Saad WE, Dariushnia S, et al. Quality improvement guidelines for percutaneous vertebroplasty. J Vasc Interv Radiol. Feb 2014;25(2):165-17.
4. Barr JD, Jensen ME, Hirsch JA, et al. Position statement on percutaneous vertebral augmentation: a consensus statement developed by the Society of Interventional Radiology (SIR), American Association of Neurological Surgeons (AANS) and the Congress of Neurological Surgeons (CNS), American College of Radiology (ACR), American Society of Neuroradiology (ASNR), American Society of Spine Radiology (ASSR), Canadian Interventional Radiology Association (CIRA), and the Society of NeuroInterventional Surgery (SNIS). J Vasc Interv Radiol. Feb 2014;25(2):171-181.
5. Blue Cross Blue Shield Association Evidence Positioning System®. 6.01.25 – Minimally Invasive Approaches to Vertebral Fractures and Osteolytic Lesions of the Spine, 05/24.
6. Blue Cross Blue Shield Association Evidence Positioning System®. 6.01.38 – Percutaneous Balloon Kyphoplasty and Mechanical Vertebral Augmentation (ARCHIVED 04/11/24).
7. Blue Cross and Blue Shield Association Technology Evaluation Center (TEC). – Percutaneous Vertebroplasty, TEC Assessments 2001 Vol. 15, No. 21.
8. Blue Cross and Blue Shield Association. Technology Evaluation Center (TEC). Percutaneous Kyphoplasty for Vertebral Fractures Caused by Osteoporosis or Malignancy. TEC Assessments 2005, Vol. 20, No. 7.
9. Blue Cross and Blue Shield Association. Technology Evaluation Center (TEC). Percutaneous Vertebroplasty for Vertebral Fractures Caused by Osteoporosis or Malignancy. TEC Assessments 2008, Vol. 25, No. 5.
10. Blue Cross and Blue Shield Association. Technology Evaluation Center (TEC). Percutaneous Vertebroplasty for Vertebral Fractures Caused by Osteoporosis or Malignancy. TEC Assessments 2005, Vol. 20, No. 6.

11. Boswell, Mark V., MD, PhD, Trescot, Andrea M, MD, Sukdeb Datta, MD, et al. Interventional Techniques:Evidence-based Practice Guidelines in the Management of Chronic Spinal Pain. Pain Physician 2007; 10:7-111, ISSN 1533-3159.
12. Buchbinder R, Johnston RV, Rischin KJ, et al. Percutaneous vertebroplasty for osteoporotic vertebral compression fracture. Cochrane Database Syst Rev. 2018;4(4):CD006349. Published 2018 Apr 4. doi:10.1002/14651858.CD006349.pub3.
13. Butler, Carina L., Given, Curtis A., Michel, Steven J., Tibbs, Phillip A. Percutaneous Sacroplasty for the Treatment of Sacral Insufficiency Fractures. AJR 2005; 184:1956-1959.
14. Centers for Medicare & Medicaid (CMS). Billing and Coding Article A57872: Percutaneous Vertebral Augmentation (PVA) for Vertebral Compression Fracture (VCF) (07/12/20).
15. Centers for Medicare & Medicaid (CMS). Local Coverage Determination (LCD) Percutaneous Vertebral Augmentation (PVA) for Vertebral Compression Fracture (VCF) (L34976) (10/01/15) (Revised 07/11/21).
16. Chiu YC, Yang SC, Kao YH, Tu YK. Percutaneous Sacroplasty for Symptomatic Sacral Pedicle Screw Loosening. Indian J Orthop. 2022 Nov 22;57(1):96-101. doi: 10.1007/s43465-022-00773-7.
17. Clark W, et al. Vertebroplasty for acute painful osteoporotic fractures (VAPOUR): study protocol for a randomized controlled trial. Trials. 2015 Apr 12;16:159.
18. Dohm M, et al. A randomized trial comparing balloon kyphoplasty and vertebroplasty for vertebral compression fractures due to osteoporosis. AJNR Am J Neuroradiol. 2014 Dec;35(12):2227-36.
19. ECRI. Percutaneous kyphoplasty for the treatment of vertebral fractures. Plymouth Meeting, PA: ECRI. 2006:75. ECRI.
20. ECRI. Percutaneous vertebroplasty for the treatment of vertebral fractures. Plymouth Meeting, PA: ECRI. Dec. 2008:123. ECRI.
21. ECRI. Percutaneous vertebroplasty for the treatment of vertebral fractures. Plymouth Meeting, PA: ECRI. 2005:123. ECRI.
22. Elnoamany H. Percutaneous Vertebroplasty: A New Serial Injection Technique to Minimize Cement Leak. Asian Spine J. 2015 Dec;9(6):855-62.
23. Frey ME, DePalma MJ, Cifu DX, et al. Efficacy and safety of percutaneous sacroplasty for painful osteoporotic sacral insufficiency fractures a prospective, multicenter trial. Spine. July 2007; 32(15): 1635-1640.
24. Gupta AC, et al. Safety and effectiveness of sacroplasty: a large single-center experience. AJNR Am J Neuroradiol. 2014 Nov-Dec;35(11):2202-6.
25. Hariri O, Takayanagi A, Miulli DE, Siddiqi J, Vrionis F. Minimally Invasive Surgical Techniques for Management of Painful Metastatic and Primary Spinal Tumors. Cureus. 2017 Mar 24;9(3):e1114.
26. Hayes, Inc. HAYES Medical Technology Directory – Percutaneous Vertebroplasty and Kyphoplasty Lansdale, PA: Hayes, Inc.; May 2004. Update performed 05/11/07.
27. Hinde K, Maingard J, Hirsch JA, Phan K, Asadi H, Chandra RV. Mortality Outcomes of Vertebral Augmentation (Vertebroplasty and/or Balloon Kyphoplasty) for Osteoporotic Vertebral Compression Fractures: A Systematic Review and Meta-Analysis. Radiology. 2020 Apr;295(1):96-103. doi: 10.1148/radiol.2020191294. Epub 2020 Feb 18.
28. Huang Y, Liu Y, Zhong F, Zhou X, Huang S, Huang C, Zhong Y. Percutaneous Curved Vertebroplasty Versus Unilateral Percutaneous Vertebroplasty for Osteoporotic Vertebral Compression Fractures: A Systematic Review and Meta-Analysis. World Neurosurg. 2024 Jan;181:29-37. doi: 10.1016/j.wneu.2023.10.035. Epub 2023 Oct 13. PMID: 37839572.
29. Jensen ME, McGraw JK, et al, Position Statement on Percutaneous Vertebral Augmentation: A Consensus Statement Developed by the American Society of Interventional and Therapeutic

Neuroradiology, Society of Interventional Radiology, American Association of Neurological Surgeons/Congress of Neurological Surgeons, and American Society of Spine Radiology, The American Journal of Neuroradiology (2007) Volume 28, 1439-1443.

30. Jian W. Symptomatic cervical vertebral hemangioma treated by percutaneous vertebroplasty. Pain Physician. 2013 Jul-Aug;16(4):E419-25.
31. Jindal V, Binyala S, Kohli SS. Balloon kyphoplasty versus percutaneous vertebroplasty for osteoporotic vertebral body compression fractures: clinical and radiological outcomes. Spine J. 2023 Apr;23(4):579-584. doi: 10.1016/j.spinee.2022.11.015. Epub 2022 Dec 5.
32. Jurczyszyn A, et al. Percutaneous Vertebroplasty for Pathological Vertebral Compression Fractures Secondary to Multiple Myeloma--Medium-Term and Long-Term Assessment of Pain Relief and Quality of Life. Adv Clin Exp Med. 2015 Jul-Aug;24(4):651-6.
33. Kao FC, Hsu YC, Chen TS, Liu PH, Tu YK. Combination of long- and short-axis alar sacroplasty techniques under fluoroscopic guidance for osteoporotic sacral insufficiency fracture. J Orthop Surg Res. 2021 Apr 17;16(1):269. doi: 10.1186/s13018-021-02409-2.
34. Klazen CA, Lohle PN, de Vries J, Jansen FH, Tielbeek AV, Blonk MC, Venmans A, van Rooij WJ, Schoemaker MC, Juttmann JR, Lo TH. Vertebroplasty versus conservative treatment in acute osteoporotic vertebral compression fractures (Vertos II): an open-label randomised trial. The Lancet. 2010 Sep 25;376(9746):1085-92.
35. Leali PT, Solla F, Maestretti G, et al. Safety and efficacy of vertebroplasty in the treatment of osteoporotic vertebral compression fractures: a prospective multicenter international randomized controlled study. Clin Cases Miner Bone Metab. Sep-Dec 2016;13(3):234-236.
36. Li Y, Feng X, Pan J, Yang M, Li L, Su Q, Tan J. Percutaneous Vertebroplasty Versus Kyphoplasty for Thoracolumbar Osteoporotic Vertebral Compression Fractures in Patients with Distant Lumbosacral Pain. Pain Physician. 2021 May;24(3):E349-E356.
37. Mahmood B, Pasternack J, Razi A, Saleh A. Safety and efficacy of percutaneous sacroplasty for treatment of sacral insufficiency fractures: a systematic review. J Spine Surg. 2019;5(3):365–371. doi:10.21037/jss.2019.06.05.
38. McGraw JK, Cardella J, Barr JD, Mathis JM, Sanchez O, Schwartzberg MS, Swan TL, Sacks D; Society of Interventional Radiology Standards of Practice Committee. Society of Interventional Radiology quality improvement guidelines for percutaneous vertebroplasty. J Vasc Interv Radiol. 2003 Sep; 14(9 Pt 2): S311-5.
39. Moser M, Jost J, Nevzati E. Kyphoplasty versus percutaneous posterior instrumentation for osteoporotic vertebral fractures with posterior wall injury: a propensity score matched cohort study. J Spine Surg. 2021 Mar;7(1):68-82. doi: 10.21037/jss-20-625.
40. National Institute for Health and Clinical Excellence. Balloon kyphoplasty for vertebral compression fractures. London: National Institute for Health and Clinical Excellence (NICE). 2006:2. National Institute for Health and Clinical Excellence (NICE).
41. National Institute for Health and Care Excellence (NICE). Technology Appraisal Guidance 279: Percutaneous vertebroplasty and percutaneous balloon kyphoplasty for treating osteoporotic vertebral compression fractures (April 2013). Accessed at https://www.nice.org.uk/.
42. National Institute for Health and Care Excellence (NICE). NICE Pathway: Metastatic Spinal Cord Compression (October 2017). Accessed at https://www.nice.org.uk/.
43. Noguchi T, Yamashita K, Kamei R, Maehara J. Current status and challenges of percutaneous vertebroplasty (PVP). Jpn J Radiol. 2023 Jan;41(1):1-13. doi: 10.1007/s11604-022-01322-w. Epub 2022 Aug 9.
44. Ontario Ministry of Health and Long-Term Care. Medical Advisory Secretariat. Balloon kyphoplasty. 2004:42. Toronto, ON, Canada: Ministry of Health and Long-Term Care.

45. Otten LA, et al. Comparison of balloon kyphoplasty with the new Kiva® VCF system for the treatment of vertebral compression fractures. Pain Physician. 2013 Sep-Oct;16(5):E505-12.

46. Richards, A.M., Mears S.C., Knight, T.A., Dinah A.F., Belkoff, S.M. Biomechanical Analysis of Sacroplasty: Does Volume or Location of Cement Matter? American Journal of Neuroradiology 30:315-317, February 2009.

47. Shi-Ming G, et al. Percutaneous vertebroplasty and percutaneous balloon kyphoplasty for osteoporotic vertebral compression fracture: A metaanalysis. Indian J Orthop. 2015 Jul-Aug;49(4):377-87.

48. Smith, Douglas k., Dix, James E. Percutaneous Sacroplasty: Long-Axis Injection Technique. AJR 2006; 186:1252-1255.

49. Strub, W.M., Hoffmann, H., Ernst, R.J., Bulas, R.V. Sacroplasty by CT and Fluoroscopic Guidance: Is the Procedure Right for Your Patient? American Journal of Neuroradiology 28:38-41, January 2007.

50. Sun HB, Jing XS, Tang H, Hai Y, Li JJ, Shan JL, Wang DC. Clinical and radiological subsequent fractures after vertebral augmentation for treating osteoporotic vertebral compression fractures: a meta-analysis. Eur Spine J. 2020 Oct;29(10):2576-2590. doi: 10.1007/s00586-020-06560-y. Epub 2020 Aug 10. PMID: 32776263.

51. Syrimpeis V, et al. Lumbar vertebral hemangioma mimicking lateral spinal canal stenosis: case report and review of literature. J Spinal Cord Med. 2014 Mar;37(2):237-42.

52. UpToDate. Management of complete and impending pathologic fractures in patients with metastatic bone disease, multiple myeloma, and lymphoma. 2024. Accessed at uptodate.com.

53. UpToDate. Minor pelvic fractures (pelvic fragility fractures) in the older adult. 2024. Accessed at uptodate.com.

54. UpToDate. Osteoporotic thoracolumbar vertebral compression fractures: Clinical manifestations and treatment. 2024. Accessed at uptodate.com.

55. UpToDate. Overview of therapeutic approaches for adult patients with bone metastasis from solid tumors. 2024. Accessed at uptodate.com.

56. Wang H, et al. Comparison of Percutaneous Vertebroplasty and Balloon Kyphoplasty for the Treatment of Single Level Vertebral Compression Fractures: A Meta-analysis of the Literature. Pain Physician. 2015 May-Jun;18(3):209-22.

57. Wang B, Zhao CP, Song LX, Zhu L. Balloon kyphoplasty versus percutaneous vertebroplasty for osteoporotic vertebral compression fracture: a meta-analysis and systematic review. J Orthop Surg Res. 2018;13(1):264. Published 2018 Oct 22. doi:10.1186/s13018-018-0952-5.

58. Whitlow, C.T., Mussat-Whitlow, B.J., Mattern, C.W.T., Baker, M.D., Morris, P.P. Sacroplasty versus Vertebroplasty: Comparable Clinical Outcomes for the Treatment of Fracture-Related Pain. American Journal of Neuroradiology 28:1266-1270, August 2007.

59. Yang EZ, Xu JG, Huang GZ, et al. Percutaneous Vertebroplasty versus conservative treatment in aged patients with acute osteoporotic vertebral compression fractures: a prospective randomized controlled clinical study. Spine (PhilaPa 1976). Apr 2016;41(8):653-660.

60. Yang SC, Tsai TT, Chen HS, Fang CJ, Kao YH, Tu YK. Comparison of sacroplasty with or without balloon assistance for the treatment of sacral insufficiency fractures. J Orthop Surg (Hong Kong). 2018;26(2):2309499018782575. doi:10.1177/2309499018782575.

61. Yi X, Lu H, Tian F, Wang Y, Li C, Liu H, Liu X, Li H. Recompression in new levels after percutaneous vertebroplasty and kyphoplasty compared with conservative treatment. Archives of Orthopaedic and Trauma Surgery. 2014;134(1):21.

62. Zhang GQ, et al. Comparison of percutaneous vertebroplasty and percutaneous kyphoplasty for the management of Kümmell's disease: A retrospective study. Indian J Orthop. 2015 Nov-Dec;49(6):577-82.

63. Zhang J, Wu CG, Gu YF, Li MH. Percutaneous sacroplasty for sacral metastatic tumors under fluoroscopic guidance only. Korean J Radiol. 2008 Nov-Dec;9(6):572-6.

64. Zhao S, Xu CY, Zhu AR, Ye L, Lv LL, Chen L, Huang Q, Niu F. Comparison of the efficacy and safety of 3 treatments for patients with osteoporotic vertebral compression fractures: A network meta-analysis. Medicine (Baltimore). 2017 Jun;96(26):e7328. doi: 10.1097/MD.0000000000007328.

65. Zheng L, Chen Z, Sun M, Zeng H, Zuo D, Hua Y, Cai Z. A preliminary study of the safety and efficacy of radiofrequency ablation with percutaneous kyphoplasty for thoracolumbar vertebral metastatic tumor treatment. Med Sci Monit. 2014 Apr 4;20:556-63.

66. Zuo XH, Zhu XP, Bao HG, et al. Network meta-analysis of percutaneous vertebroplasty, percutaneous kyphoplasty, nerve block, and conservative treatment for nonsurgery options of acute/subacute and chronic osteoporotic vertebral compression fractures (OVCFs) in short-term and long-term effects. Medicine (Baltimore). 2018;97(29):e11544. doi:10.1097/MD.0000000000011544.

COMMITTEE APPROVAL:

This Medical Coverage Guideline (MCG) was approved by the Florida Blue Medical Policy and Coverage Committee on 01/23/25.

GUIDELINE UPDATE INFORMATION:

01/25/01	Medical Coverage Guideline developed.
07/15/02	Revised coverage criteria for vertebroplasty and added investigational statement for kyphoplasty.
07/15/03	Reviewed; added coverage criteria for kyphoplasty.
01/01/04	HCPCS coding update.
06/15/04	Review and revision of guideline; consisting of updated references.
04/15/05	Review and revision of guideline; consisting of updated references.
01/01/06	Annual HCPCS coding update consisting of the addition of 22523 – 22525.
04/01/06	2nd qtr HCPCS coding update consisting of the deletion of S2362 – S2363.
01/01/07	Annual HCPCS coding update consisting of the deletion of 76012 – 76013 and the addition of 72291 – 72292.
09/15/07	Review and revision of guideline consisting of updated references and reformatted guideline.
04/15/09	Scheduled review; no change in position statement. Update references.
07/15/09	HCPCS coding revision; add 0200T & 0201T. Add investigational statement for sacroplasty. Update description section. Update guideline title. Update references.
01/01/10	Annual HCPCS coding update: revised descriptors for CPT codes 22520, 22521, 22523, 72291, and 72292.
10/15/10	Revision; related ICD-10 codes added.
01/01/11	Annual HCPCS coding update. Revised descriptors for codes 0200T, and 0201T.
06/15/11	Scheduled review; position statements maintained and references updated.
01/01/12	Annual HCPCS coding update. Revised 22520, 22521 and 22522 descriptors.
05/11/14	Revision: Program Exceptions section updated.

01/01/15	Annual CPT/HCPCS update. Added 22510, 22511, 22512, 22513, 22514, 22515. Revised 0200T, 0201T descriptors. Deleted 22520, 22521, 22522, 22523, 22524, 22525, 72291, 72292.
11/01/15	Revision: ICD-9 Codes deleted.
01/01/16	Annual CPT/HCPCS coding update. Deleted codes S2360, S2361. Revised Program Exceptions section.
03/15/16	Scheduled review. Revised description section and position statement. Updated references.
10/15/17	Revision: revised description section. Added coverage statement for percutaneous radiofrequency kyphoplasty. Updated references.
06/15/18	Unscheduled review. Revised criteria for percutaneous vertebroplasty, balloon kyphoplasty, and vertebral augmentation with KIVA. Updated references.
10/01/18	Revision: updated ICD10 coding section.
06/15/20	Scheduled review. Revised description. Revised position statement (added coverage statements for acute fracture due to trauma). Updated references.
03/15/22	Scheduled review. Revised description and index terms. Maintained position statement. Updated references.
05/23/23	Update to Program Exceptions section.
02/15/24	Scheduled review. Revised description, maintained position statements, and updated references.
02/15/25	Scheduled review. Revised description. Maintained position statement and updated references.