Cohere Medicare Advantage Policy - Proximal Tibial Osteotomy

Clinical Guidelines for Medical Necessity Review

Version: 1
Revision Date: April 3, 2025

Important Notices

Notices & Disclaimers:

GUIDELINES SOLELY FOR COHERE'S USE IN PERFORMING MEDICAL NECESSITY REVIEWS AND ARE NOT INTENDED TO INFORM OR ALTER CLINICAL DECISION MAKING OF END USERS.

Cohere Health, Inc. ("**Cohere**") has published these clinical guidelines to determine medical necessity of services (the "**Guidelines**") for informational purposes only, and solely for use by Cohere's authorized "**End Users**". These Guidelines (and any attachments or linked third party content) are not intended to be a substitute for medical advice, diagnosis, or treatment directed by an appropriately licensed healthcare professional. These Guidelines are not in any way intended to support clinical decision making of any kind; their sole purpose and intended use is to summarize certain criteria Cohere may use when reviewing the medical necessity of any service requests submitted to Cohere by End Users. Always seek the advice of a qualified healthcare professional regarding any medical questions, treatment decisions, or other clinical guidance. The Guidelines, including any attachments or linked content, are subject to change at any time without notice.

Other Notices:

Fee schedules, relative value units, conversion factors and/or related components are not assigned by the AMA, are not part of CPT, and the AMA is not recommending their use. The AMA does not directly or indirectly practice medicine or dispense medical services. The AMA assumes no liability for data contained or not contained herein.

Guideline Information:

Specialty Area: Disorders of the Musculoskeletal System
Guideline Name: Cohere Medicare Advantage Policy - Proximal Tibial Osteotomy

Date of last literature review: 3/26/2025
Document last updated: 4/2/2025
Type: [**X**] Adult (18+ yo) | [**X**] Pediatric (0-17yo)

Table of Contents

Medical Necessity Criteria

Service: Proximal Tibial Osteotomy

Benefit Category

Not applicable.

Related CMS Documents

Please refer to the CMS Medicare Coverage Database for the most current applicable CMS National Coverage.

- There are no applicable NCDs and/or LCDs for Proximal Tibial Osteotomy.

Recommended Clinical Approach

A proximal tibial osteotomy (PTO) is a surgical procedure to treat unicompartmental osteoarthritis of the knee. The surgery is also used to correct the alignment of the bones that form the knee joint, particularly in patients with a knock knee deformity (genu valgum) or with genu varum, also known as bowlegs. A PTO for genu varum can be conducted in several ways, including as a lateral closing wedge (LCW) or a medial opening wedge procedure (MOW). While 10-year survivorship of the two procedures is comparable, MOW may decrease patellar height significantly, while an LCW may result in peroneal nerve injuries.[1-3]

Evaluation of Clinical Harms and Benefits

Cohere Health uses the criteria below to ensure consistency in reviewing the conditions to be met for coverage of proximal tibia osteotomy. This process helps to prevent both incorrect denials and inappropriate approvals of medically necessary services. Specifically, limiting incorrect approvals reduces the risks associated with unnecessary procedures, such as complications from surgery, infections, and prolonged recovery times.

The potential clinical harms of using these criteria may include:

- Non-union of the osteotomy fracture. In a prospective study of 75 patients, Gilat et al. (2021) found non-union in 2.7%.[4]
- Deterioration of long-term results. Papachristou et al. (2006) followed patients who had achieved an average postoperative correction of 8.1°. After a 10-year follow-up, the average loss of postoperative correction at 10 years was 2.8°.[5]
- Deep venous thrombosis. In the study of 75 patients by Gilat et al. (2021), deep vein thrombosis occurred in 1 patient (1.3%).[4]
- Infection. Surgical site infections are among the most serious postoperative complications. Gilat et al. (2021) found that deep infection requiring wound vacuum therapy also occurred in 1 patient (1.3%).[4]
- Damage to nerves or blood vessels. Jung et al. (2025) found that tibial nerve injury is one of the major complications that may occur in high tibial osteotomy.[6]
- Increased healthcare costs and complications from the inappropriate use of emergency services and additional treatments.

The clinical benefits of using these criteria include:

- Pain relief and improved knee function. In a review of 21 included studies involving 1065 people, Brouwer et al. (2014) concluded that valgus high tibial osteotomy reduces pain and improves knee function in patients with medial compartmental osteoarthritis of the knee.[7]
- Potentially delaying the need for a knee replacement. In a systematic review, Coakley et al. (2023) found that high tibial osteotomy for valgus knee may delay the need for a total knee replacement.[8]
- Enhanced overall patient satisfaction and healthcare experience.

This policy includes provisions for expedited reviews and flexibility in urgent cases to mitigate risks of delayed access. Evidence-based criteria are employed to prevent inappropriate denials, ensuring that patients receive medically necessary care. The criteria aim to balance the need for effective treatment with the minimization of potential harms, providing numerous clinical benefits in helping avoid unnecessary complications from inappropriate care.

In addition, the use of these criteria is likely to decrease inappropriate denials by creating a consistent set of review criteria, thereby supporting optimal patient outcomes and efficient healthcare utilization.

Medical Necessity Criteria

Indications

- ➔ **Proximal tibial osteotomy** is considered appropriate if **ALL** of the following are **TRUE**[4,8,9-22]:
  - ◆ **ANY** of the following:
    - Current nicotine user with no product use for 6 weeks and **ANY** of the following:
      - Negative urine (cotinine) lab test within 30 days; **OR**
      - Surgery is urgently required due to documented reason; **OR**
    - No history of nicotine product use within the last 12 months; **OR**
    - No lifetime history of nicotine product use; **AND**
  - ◆ **ANY** of the following:
    - Genu valgum; **OR**
    - Knee instability with **ANY** of the following[10,22]:
      - ACL deficiency with coronal malalignment; **OR**
      - ACL deficiency with medial compartment arthrosis; **OR**
      - ACL deficiency with sagittal malalignment (increased tibial slope); **OR**
      - ACL deficiency with varus malalignment; **OR**
      - Chronic lateral/posterolateral ligamentous insufficiency (can be combined with cartilage restoration or meniscus preserving/replacing therapies); **OR**
    - Osteogenesis imperfecta; **OR**
    - Patellofemoral instability; **OR**
    - Posttraumatic tibial malalignment; **OR**
    - Spontaneous osteonecrosis of medial femoral condyle[13]; **OR**
    - Tibial torsion with **ALL** of the following[14]:
      - Symptoms of patellofemoral pain or patellar instability that do not respond to physical therapy; **AND**
      - Torsion of 30 degrees or more as confirmed by imaging; **OR**
    - Tumor excision or biopsy (e.g., giant cell tumor of bone, osteosarcoma)[15]; **OR**
    - Unicompartmental degenerative knee arthritis with **ALL** of the following[4]:
      - Knee range of motion includes **ALL** of the following:

        - Knee extension is normal or flexion contracture is not greater than 10°[14]; **AND**
        - Knee flexion is greater than or equal to 90°; **AND**
    - A weight-bearing radiograph shows **ANY** of the following evidence of knee arthritis:
        - Joint space narrowing (greater than 50%) in the medial compartment only[15]; **OR**
        - Marginal osteophytes or subchondral sclerosis in the medial compartment only with joint space narrowing (less than 50%)[15]; **AND**
    - Failure of conservative management for greater than 3 months, including **ALL** of the following:
        - Anti-inflammatory medications, analgesics, or prescription medications (oral steroids, narcotics, neuropathic pain medications)if not contraindicated; **AND**
        - Physical therapy; **AND**
        - Activity modifications; **AND**
        - **ANY** of the following:
            - Corticosteroid injection if medically appropriate; **OR**
            - Corticosteroid injection is contraindicated; **AND**
    - Symptoms limit activities of daily living (ADLs).

Non-Indications

➔ **Proximal tibial osteotomy** is **NOT** considered appropriate if **ANY** of the following is **TRUE**[22]:

- Lateral compartment moderate to severe osteoarthritis or meniscal deficiency; **OR**
- Rheumatoid arthritis; **OR**
- Severely limited range of motion (knee flexion less than 90° and a flexion contracture greater than 10°)[14]; **OR**
- Body mass index (BMI) greater than or equal to 30kg/m^2 [4]; **OR**
- Lower extremity ischemia; **OR**
- Active infection.

Level of Care Criteria

Inpatient or Outpatient.

Procedure Codes (HCPCS/CPT)

HCPCS/CPT Code	Code Description
27457	Osteotomy, proximal tibia, including fibular excision or osteotomy (includes correction of genu varus [bowleg] or genu valgus [knock-knee]); after epiphyseal closure
27455	Osteotomy, proximal tibia, including fibular excision or osteotomy (includes correction of genu varus [bowleg] or genu valgus [knock-knee]); before epiphyseal closure

Disclaimer: S Codes are non-covered per CMS guidelines due to their experimental or investigational nature.

Medical Evidence

Coakley et al. (2023) conducted a systematic review of the outcomes of high tibial osteotomy for valgus knee. The review included 17 papers collectively representing 517 knee procedures. The authors found HTO to be a viable treatment for correct hip-knee-ankle angles and that there is evidence to suggest that the procedure may delay the need for a total knee replacement.[8]

Bin et al. (2023) reviewed 21 studies, including 17 randomized control trials with 1749 patients. The studies compared the complications, revisions, reoperations, and functional outcomes among patients undergoing total knee arthroplasty (TKA), unicompartmental knee arthroplasty (UKA), high tibial osteotomy, bicompartmental knee arthroplasty (BCA), bi-unicompartmental knee arthroplasty (BIU), and knee joint distraction KJD). While some HTOs may require a conversion to TKA if osteoarthritis advances, successful reconstruction of joint function is accomplished by correcting varus malalignment. In addition, TKA after HTO has a higher complication rate and poor outcomes.[15]

Murray et al. (2021) discuss the indications, techniques, and outcomes for high tibial osteotomy. Evidence supports the procedure as a durable solution for joint preservation. Research shows positive outcomes with the lateral closing wedge and medial opening wedge, including the mechanical medial proximal tibial angle.[2]

The American Academy of Orthopaedic Surgeons (AAOS) published a clinical practice guideline on the *Management of Osteoarthritis of the Knee (Non-Arthroplasty).* High tibial osteotomy may improve pain and function in properly indicated patients with unicompartmental knee osteoarthritis. Studies demonstrate a pain reduction with survival rates of approximately 70% at 10 years.[21] The AAOS also published a guideline on the *Surgical Management of Osteoarthritis of the Knee.* Unicompartmental knee arthroplasty or tibial osteotomy is recommended to treat knee osteoarthritis.[13]

References

1. Tollefson LV, Lee D, Keel T, LaPrade CM, LaPrade RF. Medial opening wedge (MOW) versus lateral closing wedge (LCW) High Tibial Osteotomies for Knee Medial Compartment Osteoarthritis Show Similar Outcomes and Survivorship, While MOW Has Higher Rates of Tibial Fracture and LCW Has Higher Rates of Nerve Injury and Conversion to Total Knee. *Arthroscopy*. 2024 Nov 10:S0749-8063(24)00902-2. doi: 10.1016/j.arthro.2024.11.002. Epub ahead of print. PMID: 39532213.
2. Murray R, Winkler PW, Shaikh HS, Musahl V. High tibial osteotomy for varus deformity of the knee. *JAAOS Global Research & Reviews*. 2021 Jul 1;5(7):e21.
3. He M, Zhong X, Li Z, Shen K, Zeng W. Progress in the treatment of knee osteoarthritis with high tibial osteotomy: a systematic review. *Systematic reviews*. 2021 Dec;10:1-0.
4. Gilat R, Patel S, Knapik DM, Evuarherhe Jr A, Haunschild E, Parvaresh K, Chahla J, Yanke A, Cole B. Patient factors predictive of failure following high tibial osteotomy. *Journal of Cartilage & Joint Preservation*. 2021 Jun 1;1(2):100012.
5. Papachristou G, Plessas S, Sourlas J, Levidiotis C, Chronopoulos E, Papachristou C. Deterioration of long-term results following high tibial osteotomy in patients under 60 years of age. *Int Orthop*. 2006 Oct;30(5):403-8. doi: 10.1007/s00264-006-0098-7. Epub 2006 May 11. PMID: 16688454; PMCID: PMC3172754.
6. Jung WH, Wagh A, Seo M. Tibial nerve injury in medial open wedge-high tibial osteotomy - A rare complication with 14-year follow-up. *J Orthop Case Rep.* 2025 Jan;15(1):202-207. doi: 10.13107/jocr.2025.v15.i01.5178. PMID: 39801886; PMCID: PMC11723749.
7. Brouwer RW, Huizinga MR, Duivenvoorden T, van Raaij TM, Verhagen AP, Bierma-Zeinstra SM, Verhaar JA. Osteotomy for treating knee osteoarthritis. *Cochrane Database Syst Rev*. 2014 Dec 13;2014(12):CD004019. doi: 10.1002/14651858.CD004019.pub4. PMID: 25503775; PMCID: PMC7173694.
8. Coakley A, McNicholas M, Biant L, Tawy G. A systematic review of outcomes of high tibial osteotomy for the valgus knee. *The Knee*. 2023 Jan 1;40:97-110.
9. Hannon CP, Fillingham YA, Spangehl MJ, et al. The efficacy and safety of periarticular injection in total joint arthroplasty: A direct meta-analysis. *J Arthroplasty*. 2022 Oct;37(10):1928-1938.e9. doi: 10.1016/j.arth.2022.03.045. PMID: 36162925.
10. Valcarenghi J, Vittone G, Mouton C, Coelho Leal A, Ibañez M, Hoffmann A, Pape D, Ollivier M, Seil R. A systematic approach to managing complications after proximal tibial osteotomies of the knee. *J Exp*

Orthop. 2023 Dec 6;10(1):131. doi: 10.1186/s40634-023-00708-7. PMID: 38055158; PMCID: PMC10700288.
11. Crenshaw AH Jr. Soft-tissue procedures and osteotomies about the knee. In: Azar FM, Beaty JH, editors. Campbell's Operative Orthopaedics. 14th ed. Philadelphia, PA: Elsevier; 2021:493-523.e2.
12. Sabzevari S, Ebrahimpour A, Roudi MK, et al. High tibial osteotomy: A systematic review and current concept. *Arch Bone Jt Surg*. 2016 Jun;4(3):204-12. PMID: 27517063; PMCID: PMC4969364.
13. Goshima K, Sawaguchi T, Shigemoto K, et al. Open-wedge high tibial osteotomy for spontaneous osteonecrosis of the medial tibial plateau shows excellent clinical outcomes. *J Exp Orthop*. 2020 Mar 14;7(1):14. doi: 10.1186/s40634-020-00231-z.
14. Capella M, Gennari E, Dolfin M, Saccia F. Indications and results of high tibial osteotomy. *Annals of Joint.* 2017 Jun 22;2(6).
15. Emrani PS, Katz JN, Kessler CL, Reichmann WM, Wright EA, McAlindon TE, Losina E. Joint space narrowing and Kellgren–Lawrence progression in knee osteoarthritis: an analytic literature synthesis. *Osteoarthritis and Cartilage*. 2008 Aug 1;16(8):873-82.
16. Snow M. Tibial torsion and patellofemoral pain and instability in the adult population: Current concept review. *Curr Rev Musculoskelet Med*. 2021 Feb;14(1):67-75. doi: 10.1007/s12178-020-09688-y. PMID: 33420589; PMCID: PMC7930175.
17. National Comprehensive Cancer Network (NCCN). NCCN clinical practice guidelines: Bone cancer (ver. 1.2024). Published August 7, 2023. https://www.nccn.org/.
18. American Academy of Orthopaedic Surgeons (AAOS). Surgical management of osteoarthritis of the knee: Evidence-based clinical practice guideline. Published December 2, 2022. https://www.aaos.org/globalassets/quality-and-practice-resources/surgical-management-knee/smoak2cpg.pdf.
19. Chahla J, Dean CS, Mitchell JJ, et al. Medial opening wedge proximal tibial osteotomy. *Arthrosc Tech.* 2016 Aug 22;5(4):e919-e928. doi: 10.1016/j.eats.2016.04.019. PMID: 27709059; PMCID: PMC5040605.
20. Bin G, Jinmin L, Cong T, et al. Surgical interventions for symptomatic knee osteoarthritis: A network meta-analysis of randomized control trials. *BMC Musculoskelet Disord*. 2023 Apr 22;24(1):313. doi: 10.1186/s12891-023-06403-z. PMID: 37087428; PMCID: PMC10122318.
21. American Academy of Orthopaedic Surgeons (AAOS). Management of osteoarthritis of the knee (non-arthroplasty): Evidence-based clinical practice guideline. Published August 31, 2021. https://www.aaos.org/globalassets/quality-and-practice-resources/osteoarthritis-of-the-knee/oak3cpg.pdf.
22. Murray R, Winkler PW, Shaikh HS, Musahl V. High tibial osteotomy for varus deformity of the knee. *J Am Acad Orthop Surg Glob Res Rev*.

2021;5(7):e21.00141. Published 2021 Jul 9. doi:10.5435/JAAOSGlobal-D-21-00141.
23. Schwartz C. Minimally invasive opening wedge tibia outpatient osteotomy, using screw-to-plate locking technique and a calcium phosphate cement. *Eur J Orthop Surg Traumatol.* 2018 Jul;28(5):799-809. doi: 10.1007/s00590-017-2109-3. Epub 2018 Jan 10. PMID: 29322260.

Clinical Guideline Revision History/Information

Original Date: 04/03/2025		
Review History		