Total Knee Arthroplasty (Replacement)

Disclaimer

Clinical guidelines are developed and adopted to establish evidence-based clinical criteria for utilization management decisions. Clinical guidelines are applicable according to policy and plan type. The Plan may delegate utilization management decisions of certain services to third parties who may develop and adopt their own clinical criteria.

Coverage of services is subject to the terms, conditions, and limitations of a member's policy, as well as applicable state and federal law. Clinical guidelines are also subject to in-force criteria such as the Centers for Medicare & Medicaid Services (CMS) national coverage determination (NCD) or local coverage determination (LCD) for Medicare Advantage plans. Please refer to the member's policy documents (e.g., Certificate/Evidence of Coverage, Schedule of Benefits, Plan Formulary) or contact the Plan to confirm coverage.

Summary

The knee is composed of the lower end (distal) of the femur, the patella, and the upper end (proximal) of the tibia. There is a smooth cartilage surface at the distal end of the femur, proximal end of the tibia and undersurface of the patella. For various reasons these cartilage surfaces can wear down and sometimes erode away. In general terms this process is called arthritis, inflammation of a joint.

Total knee arthroplasty (TKA) or total knee replacement is surgical reconstruction or replacement of the distal femur, and proximal tibia, and often the undersurface of the patella. Some of the knee ligaments are removed, and other ligaments retained.

This guideline does not address partial knee arthroplasty, knee arthroscopy, or knee arthrotomy, please see MCG criteria.

Definitions

"Ambulatory" is a stay in a facility for up to 23 hours.

"Avascular necrosis" is spontaneous osteonecrosis (bone death) when there is alteration of blood supply to the bone. There are numerous causes for avascular necrosis, but in some cases the cause is unknown.

"Angular deformity" in the knees is a deviation from mechanical axis of the lower limb. The mechanical axis is a line from the center of the femoral head through the center of the knee joint to the center of the

ankle joint. The usual angular deformities are bow-legs (genu varum), knock-knees (genu valgum), or hyperextension (genu recurvatum).

"Kellgren-Lawrence System" is a five-grade classification system describing radiographic findings for osteoarthritis (Table 1).

Table 1. Kellgren-Lawrence System for classifying osteoarthritis	
Grade	Radiographic Findings
0	No radiographic features of osteoarthritis are present
I	Doubtful joint space narrowing and possible osteophytic lipping
II	Definite osteophytes and possible joint space narrowing
III	Moderate multiple osteophytes, definite joint space narrowing, some sclerosis, and possible deformity of bone contour
IV	Large osteophytes, marked joint space narrowing, severe sclerosis, and definite deformity of bone contour

"Osteoarthritis" (degenerative joint disease) is the most common form of arthritis and occurs when cartilage gradually wears down and affected bones no longer have the cushion of protective tissue. The primary symptoms are joint pain, stiffness and movement restriction.

"Revision" of total knee replacement is when surgery is needed to replace or reconstruct prior knee replacement due to failure, infection, instability or other indications.

"Rheumatoid arthritis" is an autoimmune disease causing chronic inflammation in joints and tissue. Over long periods of time, the inflammation can cause joint deformity, bone and cartilage erosion.

Clinical Indications

General Clinical Indications

(For partial knee arthroplasty, knee arthroscopy, or knee arthrotomy, please see MCG criteria)
Total knee arthroplasty for a unilateral knee is considered medically necessary when ONE of the following criteria are met:

1. The member meets medical necessity for advanced joint disease as indicated by ALL of the following:
    a. Radiologic or arthroscopic findings of advanced knee joint destruction documented by the treating surgeon and/or radiologist for ONE of the following:
        i. Kellgren Lawrence Grade IV radiographic findings (Table 1); *or*

ii. Exposed subchondral bone, which is erosion of articular cartilage that exposes subchondral bone often designated as Modified Outerbridge Classification IV; *or*
iii. Symptomatic angular deformity with accompanying radiographic changes; *or*
iv. Symptomatic avascular necrosis of the femoral condyles or proximal tibia with accompanying radiographic changes; *and*

b. Severe pain persisting in the affected knee that interferes with functional activity or age-appropriate activities for at least 3-months (e.g., ambulation, prolonged standing, ability to sleep); *and*
c. There has been a failure to decrease pain or improve function after at least a 3-month trial of conservative treatment (non-surgical) which has included ALL of the following:
    i. Active and ongoing participation in a physical therapy (documented) or a well documented home exercise program under the supervision of a physical therapist or physician, (e.g., lower extremity flexibility and strengthening program, activity modification, and/or weight loss program), unless poorly tolerated or contraindicated; *and*
    ii. Oral/topical medications (e.g., analgesics, NSAIDs, serotonin/norepinephrine reuptake Inhibitor (duloxetine)), unless poorly tolerated or contraindicated; *and*
    iii. No intra-articular steroid injections to the knee within three months before the surgery date; *and*
d. If there is a separate request for the device, implant or prosthesis that will be inserted during surgery, it must be FDA approved (unless the member is enrolled in an approved clinical trial as defined by the plan benefit); *and*
e. No contraindication present or the request is not considered Experimental or Investigational, or Not Medically Necessary based on the indications listed below; *or*

2. Failure of previous surgical interventions such as ONE of the following:
    a. Previous proximal tibial or distal femoral osteotomy; *or*
    b. Previous unicompartmental knee replacement with continued pain interfering with ADLs; *or*
3. Post-traumatic injury (e.g., fracture, infection) causing debilitating knee joint destruction affecting movement, causing pain and stiffness; *or*
4. Bone tumor involving the knee that requires excision.

Please Note: If the member is a smoker or nicotine product user, it is recommended the member has stopped using within 4 weeks of surgery or has been provided a well documented education plan on options to quit such as referral to a cessation program, pharmacologic, and over the counter treatments.

Simultaneous Bilateral Surgery

Total knee arthroplasty for simultaneous bilateral surgery is considered medically necessary if ALL of the following criteria are met:

1. Each knee meets medical necessity for criteria under General Clinical Indications; *and*
2. Meets the inpatient hospital Levels of Care criteria (see below).

Removal or Revision of Total Knee Arthroplasty

Removal (resection with subsequent reimplantation at a later time or permanent resection arthroplasty with no reimplantation planned) or Revision (members may require multi-staged surgeries to complete revision over time)

The removal or revision of a total knee prosthesis is considered medically necessary when ALL of the following criteria are met:

1. In the affected knee requested without history of prior infection, no current or ongoing knee infection (e.g., supporting labs and cultures, no longer on antibiotics, assessment by treating surgeon); *and*
2. One of the following:
    a. Prosthesis/hardware failure, damage or fracture*; or*
    b. Loosening of prosthesis, implant or components that is confirmed by imaging*; or*
    c. Periprosthetic Knee fracture*; or*
    d. Instability or dislocation of the knee*; or*
    e. The member has functional disability AND persistent pain for more than 6 months*; or*
    f. Bearing surface wear leading to symptomatic synovitis*; or*
    g. Significant limb malalignment post TKA*; or*
    h. Symptomatic abnormal joint line on imaging as it pertains to physical exam and clinical findings; *or*
3. If the member has an actively infected knee prosthesis or periprosthetic infection, one of the following criteria must be met:
    a. The member must first have completed medical management (e.g., antibiotics), or interventions such as washouts (including irrigation and debridement) or spacer placement/replacement prior to surgery day of inserted prosthesis, i.e., the member must clear out all infection (e.g., negative cultures) prior to the day of planned procedure whether one-stage or two-stage exchange)*; or*
    b. There is documentation for either planned medical or interventional management to address the source of infection prior to revision/replacement of the prosthesis; *or*
4. Additional staged surgery is needed as part of a multispecialty approach to any one of the conditions listed above. This could include, but is not limited to, the replacement of impregnated antibiotic spacers, additional joint washouts, and the removal or replacement of hardware.

Levels of Care

Ambulatory Surgical Center, Outpatient Hospital

The following indications are appropriate for ambulatory surgical centers and outpatient hospital level of care:

- Unilateral TKA
- Staged TKA on both knees (request for each knee still needs to meet medical necessity and staggered typically between 30-90 days following the first total knee joint replacement).
- An additional day as an ambulatory or observation level of care might be needed for a safe transition to oral pain medication.

Inpatient Hospital

Inpatient hospital level of care for simultaneous bilateral total knee arthroplasty may be considered medically necessary if an ambulatory or outpatient hospital is unable to monitor the member's needs. Furthermore, each knee must meet medical necessity.

The member may also meet inpatient hospital level of care for unilateral or bilateral total knee replacement if ONE of the following are met:

- Non-elective surgery for unilateral or bilateral; *or*
- For members requesting unilateral or bilateral revision procedures that require an extended stay outside of the ambulatory or outpatient hospital timeframe, or are unable to be discharged and expected to be admitted/transferred to acute or subacute rehab facility (the member must also meet Oscar's utilization review criteria for the rehabilitation facility); *or*
- The member requires more prolonged postoperative treatment or management for unilateral or bilateral due to comorbidities which may include ANY of the following:
    - need for parenteral bridging anticoagulation
    - NYHA class III or IV heart failure
    - pulmonary fibrosis
    - pulmonary hypertension
    - history of thromboembolism
    - extensive edema
    - chronic systemic corticosteroid use
    - severely reduced renal function
    - Poorly controlled type 1 diabetes
    - recent history of falls
    - Significant dementia
    - BMI > 40
    - Age > 70 and an additional comorbidity as listed in this section
    - Significant movement abnormalities (eg, stroke, Parkinson disease, dependent functional status); *or*

- For a member to meet inpatient level of care for pain management after TKA surgery, the member must meet the criteria in MCG Pain Management GRG (PG-PM) criteria for unilateral or bilateral; *or*
- An inpatient admission for a unilateral or bilateral request may be considered medically necessary when the member meets MCG Ambulatory Surgery Exception Criteria (CG-AEC).

Extension Requests

The Plan considers extension requests for inpatient level of care medically necessary when the member continues to meet extension criteria in MCG Knee Arthroplasty, Total for milestones of recovery, clinical status is improving during IP stay, and is not ready to be transitioned to an alternative or lower level of care. Extension requests should be based on medical records of progress.

Experimental or Investigational / Not Medically Necessary

The Plan considers the following conditions as contraindications:

- Generalized infection, active illness under medical management
- Active infection in the knee, unless surgery is for revision for TKA
- Active wound or skin infection at the planned knee joint for surgery
- The member has not reached skeletal maturity
- Allergy to components of the implant

The following indications are considered not medically necessary:

- Customized total or partial knee implant
- Progressive neurologic disease affecting lower extremity and extensor mechanism
- Chronic lower extremity ischemia or vascular insufficiency severe enough to compromise recovery
- Anemia has not been investigated and managed
- Joint instability that has not been managed prior to TKA

The following indications are considered experimental/investigational/unproven:

- UniSpacer interpositional spacer
- Persona IQ Smart Knee Implant (Zimmer Biomet) for Total Knee Arthroplasty

Applicable Billing Codes (HCPCS/CPT Codes)

Service(s) name	
Initial TKA CPT/HCPCS Codes considered medically necessary if criteria are met:	
Code	*Description*
27445	Arthroplasty, knee, hinge prosthesis (eg, Walldius type)

27447	Arthroplasty, knee, condyle and plateau; medial AND lateral compartments with or without patella resurfacing (total knee arthroplasty)
C1776	Joint device (implantable)
Removal or Revision for TKA CPT/HCPCS Codes considered medically necessary if criteria are met:	
Code	*Description*
27486	Revision of total knee arthroplasty, with or without allograft; 1 component
27487	Revision of total knee arthroplasty, with or without allograft; femoral and entire tibial component
27488	Removal of prosthesis, including total knee prosthesis, methylmethacrylate with or without insertion of spacer, knee

CPT/HCPCS codes *not* considered medically necessary or considered experimental or investigational:	
Code	*Description*
27599	Unlisted procedure, femur or knee ● Due to the broad nature of this code and lack of specificity in certain scenarios, clarification is provided below: ● When this code is billed for customized knee implant, UniSpacer interpositional spacer or Persona IQ Smart Knee Implant (Zimmer Biomet), it is considered experimental/investigational
C1776	Joint device (implantable) ● Due to the broad nature of this code and lack of specificity in certain scenarios, clarification is provided below: ● When this code is billed for customized knee implant, UniSpacer interpositional spacer, Persona IQ Smart Knee Implant (Zimmer Biomet), etc., or devices not FDA approved, then it is considered NOT medically necessary.

References

1. Albanese, J., Feltri, P., Boffa, A., Werner, B. C., Traina, F., & Filardo, G. (2023). Infection risk increases after total hip arthroplasty within 3 months following intra-articular corticosteroid injection. A meta-analysis on knee and hip arthroplasty. The Journal of Arthroplasty, 38(6), 1184-1193.
2. Alghadir, A.H., Iqbal, Z.A., Anwer, S. et al. Comparison of simultaneous bilateral versus unilateral total knee replacement on pain levels and functional recovery. BMC Musculoskelet Disord 21, 246 (2020).
3. American Academy of Orthopaedic Surgeons. Surgical Management of Osteoarthritis of the Knee. Evidence Based Clinical Practice Guideline. www.aaos.org/smoakcpg . Published September 4, 2015.

4. Berbari E, Baddour LM, Chen AF. Prosthetic joint infection: Treatment. UpToDate.com. UpToDate, Waltham, MA. Last updated Oct 29, 2021. Retrieved from https://www.uptodate.com/contents/prosthetic-joint-infection-treatment?search=spacer%20in%20knee%20surgery&source=search_result&selectedTitle=5~150&usage_type=default&display_rank=5
5. Courtine M, Labattut L, Martz P, Baulot E. The unicompartmental knee implant UniSpacerTM: Ten-year outcomes after treatment for medial tibio-femoral osteoarthritis. *Orthop Traumatol Surg Res*. 2021 May;107(3):102873. doi: 10.1016/j.otsr.2021.102873.
6. Deveza LA. Overview of the management of osteoarthritis. UpToDate.com. UpToDate, Waltham, MA. Last updated April 15, 2022. Retrieved from https://www.uptodate.com/contents/overview-of-the-management-of-osteoarthritis?search=kellgren%20lawrence&source=search_result&selectedTitle=1~29&usage_type=default&display_rank=1
7. Deveza LA, Bennell K. Management of knee osteoarthritis. UpToDate.com. UpToDate, Waltham, MA. Last updated April 5, 2022. Retrieved from https://www.uptodate.com/contents/management-of-knee-osteoarthritis?search=kellgren%20lawrence&topicRef=106097&source=see_link
8. Duchman KR, Gao Y, Pugely AJ, Martin CT, Noiseux NO, Callaghan JJ. The Effect of Smoking on Short-Term Complications Following Total Hip and Knee Arthroplasty. J Bone Joint Surg Am. 2015 Jul 1;97(13):1049-58.
9. Feltri P, Mondini Trissino da Lodi C, Grassi A, Zaffagnini S, Candrian C, Filardo G. One-stage bilateral unicompartmental knee arthroplasty is a suitable option vs. the two-stage approach: a meta-analysis. EFORT Open Rev. 2021 Nov 19;6(11):1063-1072.
10. Flierl, M. A., Sobh, A. H., Culp, B. M., Baker, E. A., & Sporer, S. M. (2019). Evaluation of the Painful Total Knee Arthroplasty. The Journal of the American Academy of Orthopaedic Surgeons, 27(20), 743–751.https://doi.org/10.5435/JAAOS-D-18-00083
11. Ghasemi SA, Rashidi S, Rasouli MR, Parvizi J. Staged Bilateral Total Knee Arthroplasty: When Should the Second Knee be Replaced? Arch Bone Jt Surg. 2021 Nov;9(6):633-640.
12. Ginnetti, J. G., O'Connor, M. I., Chen, A. F., & Myers, T. G. (2022). Total Joint Arthroplasty Training (Prehabilitation and Rehabilitation) in Lower Extremity Arthroplasty. Journal of the American Academy of Orthopaedic Surgeons, 30(11), e799-e807.
13. Gupta P, Gupta V, Patil B,Verma V. Angular deformities of lower limb in children: Correction for whom, when and how? Journal of Clinical Orthopaedics and Trauma. 2020; 11(2): 196-201, ISSN 0976-5662. doi:https://doi.org/10.1016/j.jcot.2020.01.008.
14. Haffar, A., Fillingham, Y. A., Breckenridge, L., Gursay, D., & Lonner, J. H. (2022). Meloxicam versus Celecoxib for Postoperative Analgesia after Total Knee Arthroplasty: Safety, Efficacy and Cost. Journal of the American Academy of Orthopaedic Surgeons. Global research & reviews, 6(4), e22.00032. https://doi.org/10.5435/JAAOSGlobal-D-22-00032
15. Hayes, Inc. Evidence Analysis Research Brief. Persona IQ Smart Knee Implant (Zimmer Biomet) for Total Knee Arthroplasty. Lansdale, PA: Hayes, Inc.; Nov 2021.
16. Hogan, K. A. (2013). Nonoperative Treatment of Knee Osteoarthritis. JBJS Journal of Orthopaedics for Physician Assistants, 1(1), 35-38.
17. Kellgren J & Lawrence J. Radiological Assessment of Osteo-Arthrosis. Ann Rheum Dis. 1957;16(4):494-502. doi:10.1136/ard.16.4.494
18. Kohn M, Sassoon A, Fernando N. Classifications in Brief: Kellgren-Lawrence Classification of Osteoarthritis. Clinical Orthopaedics & Related Research. 2016;474(8):1886-1893. doi:10.1007/s11999-016-4732-4
19. Lachiewicz, P. F., Watters, T. S., & Jacobs, J. J. (2016). Metal hypersensitivity and total knee arthroplasty. The Journal of the American Academy of Orthopaedic Surgeons, 24(2), 106.
20. Liu L, Liu H, Zhang H, Song J, Zhang L. Bilateral total knee arthroplasty: Simultaneous or staged? A systematic review and meta-analysis. Medicine (Baltimore). 2019 May;98(22):e15931.
21. Luscombe JC, Theivendran K, Abudu A, Carter SR. The relative safety of one-stage bilateral total knee arthroplasty. Int Orthop. 2009 Feb;33(1):101-4.

22. Lum, Z. C., Saiz, A. M., Pereira, G. C., & Meehan, J. P. (2020). Patella Baja in Total Knee Arthroplasty. The Journal of the American Academy of Orthopaedic Surgeons, 28(8), 316–323. https://doi.org/10.5435/JAAOS-D-19-00422
23. Martin GM, Harris I. Total Knee Arthroplasty. UpToDate.com. UpToDate, Waltham, MA. Last updated Sept 12, 2023. Retrieved from https://www.uptodate.com/contents/total-knee-arthroplasty?search=total%20knee%20arthroplasty&source=search_result&selectedTitle=1~139&usage_type=default&display_rank=1
24. Martin GM, Harris I. Complications of total knee arthroplasty. UpToDate.com. UpToDate, Waltham, MA. Last updated Mar 29, 2022.
25. Mardani-Kivi M, Leili EK, Torfeh N, Azari Z. Bilateral total knee arthroplasty: Simultaneous versus staging in the same or in twice hospitalization. J Clin Orthop Trauma. 2020 Sep 22;14:59-64.
26. McGrory, Brian J. MD, MS; Weber, Kristy L. MD; Jevsevar, David S. MD, MBA; Sevarino, Kaitlyn MBA. Surgical Management of Osteoarthritis of the Knee: Evidence-based Guideline. Journal of the American Academy of Orthopaedic Surgeons: August 2016 - Volume 24 - Issue 8 - p e87-e93 doi: 10.5435/JAAOS-D-16-00159
27. Middleton S, Toms A. Allergy in total knee arthroplasty: a review of the facts. Bone Joint J. 2016 Apr;98-B(4):437-41. doi: 10.1302/0301-620X.98B4.36767. PMID: 27037424.
28. Christensen, D. D., Klement, M. R., Moschetti, W. E., & Fillingham, Y. A. (2020). Current evidence-based indications for modern noncemented total knee arthroplasty. JAAOS-Journal of the American Academy of Orthopaedic Surgeons, 28(20), 823-829.
29. National Institute for Health and Care Excellence (NICE). (March 29, 2022). Quality standard on joint replacement (primary) – Hip, knee and shoulder). Quality standard [QS206]. Retrieved from https://www.nice.org.uk/guidance/qs206
30. National Institute for Health and Care Excellence (NICE). (June 4, 2020). Joint replacement (primary): hip, knee and shoulder. NICE guideline [NG157]. Retrieved from https://www.nice.org.uk/guidance/ng157
31. Naylor, B. H., Seidman, D., & Scuderi, G. R. (2021). Bridging the Gap: The Influence of Foot and Ankle Pathomechanics in Total Knee Arthroplasty. JAAOS-Journal of the American Academy of Orthopaedic Surgeons, 29(14), e693-e701.
32. Onggo, J. R., Onggo, J. D., De Steiger, R., & Hau, R. (2020). Greater risks of complications, infections, and revisions in the obese versus non-obese total hip arthroplasty population of 2,190,824 patients: a meta-analysis and systematic review. Osteoarthritis and Cartilage, 28(1), 31-44.
33. Pierce, J. P. (2022). Quitting smoking by age 35 years—a goal for reducing mortality. JAMA network open, 5(10), e2231487-e2231487
34. Pollock, M., Lanting, B., Somerville, L., & Firth, A. (2016). Outpatient total hip arthroplasty, total knee arthroplasty, and unicompartmental knee arthroplasty–a systematic review of the literature. Osteoarthritis and Cartilage, 24, S433.
35. Rehman Y, Lindberg MF, Arnljot K, Gay CL, Lerdal A, Aamodt A. More Severe Radiographic Osteoarthritis Is Associated With Increased Improvement in Patients' Health State Following a Total Knee Arthroplasty. J Arthroplasty. 2020 Nov;35(11):3131-3137
36. Richardson, S. S., Schairer, W. W., Sculco, T. P., & Sculco, P. K. (2019). Comparison of infection risk with corticosteroid or hyaluronic acid injection prior to total knee arthroplasty. JBJS, 101(2), 112-118.
37. Seward, M. W., Briggs, L. G., Bain, P. A., & Chen, A. F. (2021). Preoperative nonsurgical weight loss interventions before total hip and knee arthroplasty: a systematic review. The Journal of Arthroplasty, 36(11), 3796-3806.
38. Slattery C, Kweon CY. Classifications in Brief: Outerbridge Classification of Chondral Lesions. Clin Orthop Relat Res. 2018 Oct;476(10):2101-2104. doi: 10.1007/s11999.0000000000000255. PMID: 29533246; PMCID: PMC6259817.
39. Takagawa S, Kobayashi N, Yukizawa Y, Oishi T, Tsuji M, Misumi T, Inaba Y. Identifying factors predicting prolonged rehabilitation after simultaneous bilateral total knee arthroplasty: a retrospective observational study. BMC Musculoskelet Disord. 2021 Apr 20;22(1):368. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8058996/

40. Wainwright TW, Gill M, McDonald DA, Middleton RG, et al. (2020) Consensus statement for perioperative care in total hip replacement and total knee replacement surgery: Enhanced Recovery After Surgery (ERAS®) Society recommendations, Acta Orthopaedica, 91:1, 3-19, DOI: 10.1080/17453674.2019.1683790
41. Wang, L., Lee, M., Zhang, Z., Moodie, J., Cheng, D., & Martin, J. (2016). Does preoperative rehabilitation for patients planning to undergo joint replacement surgery improve outcomes? A systematic review and meta-analysis of randomised controlled trials. BMJ open, 6(2), e009857.

Clinical Guideline Revision / History Information

Original Date: 1/31/2023

Reviewed/Revised: 5/02/2023, 10/19/2023, 01/23/2024, 4/16/2024