

Knee Replacement protocol

Total Knee Arthroplasty Indications:

- P3 Health Partners will consider total knee replacement surgery medically necessary when one or more of the following criteria are met:
 - Advanced joint disease demonstrated by:
 - Radiographic supported evidence or when conventional radiography is not adequate, magnetic resonance imaging (MRI) supported evidence (subchondral cysts, subchondral sclerosis, periarticular osteophytes, joint subluxation, joint space narrowing, avascular necrosis); **and**
 - Pain or functional disability from injury due to trauma or arthritis of the joint; **and**
 - History of unsuccessful conservative therapy (non-surgical medical management) that is clearly addressed in the pre procedure medical record.
 - **This conservative therapy must be documented as occurring for at least 24 weeks prior to having been considered to have failed**
 - **This conservative therapy must include:**
 - anti-inflammatory medications, analgesics,
 - flexibility and muscle strengthening exercises
 - supervised physical therapy [Activities of daily living (ADLs), diminished despite completing a plan of care
 - assistive device use
 - weight reduction as appropriate
 - therapeutic injections into the knee as appropriate.
 - In rare circumstances, for example, if the patient has bone on bone articulation, severe deformity, or pain or significant disabling interference with activities of daily living, the surgeon may determine that nonsurgical medical management would be ineffective or counterproductive, and that the best treatment option, after explaining the risks, is surgical. **If medical management is deemed inappropriate, the medical record should indicate the rationale for and circumstances under which this is the case.**
 - Failure of a previous osteotomy
 - Distal femur fracture
 - Malignancy of the distal femur, proximal tibia, knee joint or adjacent soft tissue
 - Failure of previous unicompartamental knee replacement
 - Avascular necrosis of the knee
 - Proximal tibia fracture



Replacement/Revision of Total Knee Arthroplasty Indications

- P3 Health Partners will consider Replacement/Revision of Total Knee Arthroplasty medically necessary when one or more of the following criteria are met
 - Loosening of one or more components
 - Fracture or mechanical failure of one or more component
 - Infection
 - Treatment of periprosthetic fracture of distal femur, proximal tibia or patella
 - Progressive or substantial periprosthetic bone loss
 - Bearing surface wear leading to symptomatic synovitis
 - Implant or knee misalignment
 - Knee stiffness/arthrofibrosis
 - Tibiofemoral instability
 - Extensor mechanism instability

All of the following should be documented in the medical record prior to scheduling the procedure

- Ruling out sources of infection, including dental and lower urinary tract infections.
- For members with significant conditions or co-morbidities, the risk/benefit of Total Knee Arthroplasty should be appropriately addressed in the medical record.
- Case Management referral has been completed and member is established with P3 Health Partners Case Manager.
 - ✚ PCP notifies team in chart review meeting of possible referral to ortho for joint replacement.
 - ✚ MA or PCP CM to contact member regarding possible "social issues" that would impact procedure post op recovery.
 - ✚ Evaluate if member has appropriate resources-transportation to follow up appts, caregiver resources for groceries, Rx retrieval, anticoagulation costs if needed and self-care ability.
 - ✚ Evaluate if member would need inpatient rehab/SNF for recovery.
 - ✚ Ortho MD/ team to ensure and document follow up with CM and nonsurgical conservative treatment.

CMS

Local Coverage Determination (LCD):

Total Knee Arthroplasty (L36577) Oregon and Arizona

Total Knee Arthroplasty (L36575) Nevada

MCG

Knee Arthroplasty, Total, ORG: S-700

References

1. Mihalko WM. Arthroplasty of the knee. In: Azar FM, Beatty JH, Canale ST, editors. Campbell's Operative Orthopaedics. 13th ed. Philadelphia, PA: Elsevier; 2017:395-468.
2. Lanting BA, Lieberman JR, Callaghan JJ, Berend ME, MacDonald SJ. Ensuring a winner: the ABCs of primary total knee arthroplasty. *Instructional Course Lectures* 2015;64:369-79.
3. Carr AJ, et al. Knee replacement. *Lancet* 2012;379(9823):1331-40.
4. Skou ST, et al. A randomized, controlled trial of total knee replacement. *New England Journal of Medicine* 2015;373(17):1597-606.
5. Bozic KJ, Maselli J, Pekow PS, Lindenauer PK, Vail TP, Auerbach AD. The influence of procedure volumes and standardization of care on quality and efficiency in total joint replacement surgery. *Journal of Bone and Joint Surgery. American Volume* 2010;92(16):2643-52.
6. Odum SM, Springer BD. In-hospital complication rates and associated factors after simultaneous bilateral versus unilateral total knee arthroplasty. *Journal of Bone and Joint Surgery. American Volume* 2014;96(13):1058-1065.
7. Richmond JC. Surgery for osteoarthritis of the knee. *Rheumatic Diseases Clinics of North America* 2013;39(1):203-11.
8. Cerciello S, Vasso M, Maffulli N, Neyret P, Corona K, Panni AS. Total knee arthroplasty after high tibial osteotomy. *Orthopedics* 2014;37(3):191-8.
9. Bohm ER, Tufescu TV, Marsh JP. The operative management of osteoporotic fractures of the knee: to fix or replace? *Journal of Bone and Joint Surgery. British Volume* 2012;94(9):1160-9.
10. Bus MP, van de Sande MA, Fiocco M, Schaap GR, Bramer JA, Dijkstra PD. What are the long-term results of MUTARS modular endoprostheses for reconstruction of tumor resection of the distal femur and proximal tibia? *Clinical Orthopaedics and Related Research* 2017;475(3):708-18.
11. Sharkey MS, Grunseich K, Carpenter TO. Contemporary medical and surgical management of X-linked hypophosphatemic rickets. *Journal of the American Academy of Orthopedic Surgeons* 2015;23(7):433-42.
12. Vanderhave KL, et al. Musculoskeletal care of the hemophiliac patient. *Journal of the American Academy of Orthopedic Surgeons* 2012;20(9):553-63.
13. Vince KG. The problem total knee replacement: systematic, comprehensive and efficient evaluation. *Bone and Joint Journal* 2014;96-B(11 Supple A):105-11.

14. Dalling JG, Math K, Scuderi GR. Evaluating the progression of osteolysis after total knee arthroplasty. *Journal of the American Academy of Orthopedic Surgeons* 2015;23(3):173-80.
15. Osmon DR, et al. Diagnosis and management of prosthetic joint infection: clinical practice guidelines by the Infectious Diseases Society of America. *Clinical Infectious Diseases* 2013;56(1):e1-e25.
16. Gehrke T, Alijanipour P, Parvizi J. The management of an infected total knee arthroplasty. *Bone and Joint Journal* 2015;97-B(10 Suppl A):20-9.
17. Haidukewych GJ, Langford J, Liporace FA. Revision for periprosthetic fractures of the hip and knee. *Journal of Bone and Joint Surgery. American Volume* 2013;95(4):368-76.
18. Appropriate use criteria for non-arthroplasty treatment of osteoarthritis of the knee. [Internet] American Academy of Orthopaedic Surgeons. Accessed at: http://www.orthoguidelines.org/go/auc/auc.cfm?auc_id=224791. Updated 2012 [accessed 2017 Sep 20]
19. Berger RA, Cross MB, Sanders S. Outpatient hip and knee replacement: the experience from the first 15 years. *Instructional Course Lectures* 2016;65:547-51.
20. Kolisek FR, McGrath MS, Jessup NM, Monesmith EA, Mont MA. Comparison of outpatient versus inpatient total knee arthroplasty. *Clinical Orthopaedics and Related Research* 2009;467(6):1438-42.
21. Premier hospital database, 10/1/2015 - 3/31/2017. Premier, Inc.
22. Bini SA, Inacio MC, Cafri G. Two-day length of stay is not inferior to 3 days in total knee arthroplasty with regards to 30-day readmissions. *Journal of Arthroplasty* 2015;30(5):733-8.
23. Keeney JA, Nam D, Johnson SR, Nunley RM, Clohisey JC, Barrack RL. The impact of risk reduction initiatives on readmission: THA and TKA readmission rates. *Journal of Arthroplasty* 2015;30(12):2057-60.
24. Sutton JC, Antoniou J, Epure LM, Huk OL, Zukor DJ, Bergeron SG. Hospital discharge within 2 days following total hip or Knee arthroplasty does not increase major-complication and readmission rates. *Journal of Bone and Joint Surgery. American Volume* 2016;98(17):1419-28.
25. Molloy IB, Martin BI, Moschetti WE, Jevsevar DS. Effects of the length of stay on the cost of total knee and total hip arthroplasty from 2002 to 2013. *Journal of Bone and Joint Surgery. American Volume* 2017;99(5):402-7.

26. Daines BK, Dennis DA, Amann S. Infection prevention in total knee arthroplasty. *Journal of the American Academy of Orthopedic Surgeons* 2015;23(6):356-64.
27. Levine BR, Haughom B, Strong B, Hellman M, Frank RM. Blood management strategies for total knee arthroplasty. *Journal of the American Academy of Orthopedic Surgeons* 2014;22(6):361-71.
28. Falck-Ytter Y, et al. Prevention of VTE in orthopedic surgery patients: antithrombotic therapy and prevention of thrombosis, 9th ed: American College of Chest Physicians evidence-based clinical practice guidelines. *Chest* 2012;141(2 Suppl):e278S-325S.
29. Forster R, Stewart M. Anticoagulants (extended duration) for prevention of venous thromboembolism following total hip or knee replacement or hip fracture repair. *Cochrane Database of Systematic Reviews* 2016, Issue 3. Art. No.: CD004179.
30. Pathak R, et al. Meta-analysis on efficacy and safety of new oral anticoagulants for venous thromboembolism prophylaxis in elderly elective postarthroplasty patients. *Blood Coagulation & Fibrinolysis* 2015;26(8):934-9.
31. Barrington JW, Halaszynski TM, Sinatra RS, Expert Working Group On Anesthesia And Orthopaedics Critical Issues In Hip And Knee Replacement Arthroplasty FT. Perioperative pain management in hip and knee replacement surgery. *American Journal of Orthopedics (Belle Mead, N.J.)* 2014;43(4 Suppl):S1-S16.
32. Moucha CS, Weiser MC, Levin EJ. Current strategies in anesthesia and analgesia for total knee arthroplasty. *Journal of the American Academy of Orthopedic Surgeons* 2016;24(2):60-73. DOI: 10.5435/JAAOS-D-14-00259.
33. Cram P, Lu X, Kates SL, Singh JA, Li Y, Wolf BR. Total knee arthroplasty volume, utilization, and outcomes among Medicare beneficiaries, 1991-2010. *Journal of the American Medical Association* 2012;308(12):1227-36.
34. Keswani A, Lovy AJ, Robinson J, Levy R, Chen D, Moucha CS. Risk factors predict increased length of stay and readmission rates in revision joint arthroplasty. *Journal of Arthroplasty* 2016;31(3):603-8. DOI: 10.1016/j.arth.2015.09.050.
35. Halawi MJ, Vovos TJ, Green CL, Wellman SS, Attarian DE, Bolognesi MP. Preoperative predictors of extended hospital length of stay following total knee arthroplasty. *Journal of Arthroplasty* 2015;30(3):361-4. DOI: 10.1016/j.arth.2014.10.025.
36. Memtsoudis SG, et al. Does the impact of the type of anesthesia on outcomes differ by patient age and comorbidity burden? *Regional Anesthesia and Pain Medicine* 2014;39(2):112-9.

37. Alshryda S, Sukeik M, Sarda P, Blenkinsopp J, Haddad FS, Mason JM. A systematic review and meta-analysis of the topical administration of tranexamic acid in total hip and knee replacement. *Bone and Joint Journal* 2014;96-B(8):1005-15.
38. Melvin JS, Stryker LS, Sierra RJ. Tranexamic acid in hip and knee arthroplasty. *Journal of the American Academy of Orthopedic Surgeons* 2015;23(12):732-40.
39. Wang H, Shen B, Zeng Y. Blood loss and transfusion after topical tranexamic acid administration in primary total knee arthroplasty. *Orthopedics* 2015;38(11):e1007-16.
40. Opperer M, Poeran J, Rasul R, Mazumdar M, Memtsoudis SG. Use of perioperative hydroxyethyl starch 6% and albumin 5% in elective joint arthroplasty and association with adverse outcomes: a retrospective population based analysis. *British Medical Journal* 2015;350:h1567.
41. Raines BT, Ponce BA, Reed RD, Richman JS, Hawn MT. Hospital acquired conditions are the strongest predictor for early readmission: An analysis of 26,710 arthroplasties. *Journal of Arthroplasty* 2015;30(8):1299-307. DOI: 10.1016/j.arth.2015.02.024.
42. Schairer WW, Vail TP, Bozic KJ. What are the rates and causes of hospital readmission after total knee arthroplasty? *Clinical Orthopaedics and Related Research* 2014;472(1):181-7.
43. Merkow RP, et al. Underlying reasons associated with hospital readmission following surgery in the United States. *Journal of the American Medical Association* 2015;313(5):483-95.
44. Proprietary health insurance data sources (2015-2016); and Medicare 100% Standard Analytical File (2014-2015).
45. Preyde M, Brassard K. Evidence-based risk factors for adverse health outcomes in older patients after discharge home and assessment tools: a systematic review. *Journal of Evidence-Based Social Work* 2011;8(5):445-68.
46. Billings J, Dixon J, Mijanovich T, Wennberg D. Case finding for patients at risk of readmission to hospital: development of algorithm to identify high risk patients. *British Medical Journal* 2006;333(7563):327.
47. van Walraven C, et al. Derivation and validation of an index to predict early death or unplanned readmission after discharge from hospital to the community. *Canadian Medical Association Journal* 2010;182(6):551-7.
48. Hasan O, et al. Hospital readmission in general medicine patients: a prediction model. *Journal of General Internal Medicine* 2010;25(3):211-9.

49. Billings J, Blunt I, Steventon A, Georghiou T, Lewis G, Bardsley M. Development of a predictive model to identify inpatients at risk of re-admission within 30 days of discharge (PARR-30). *BMJ Open* 2012;2(4):e001667.
50. Jencks SF, Williams MV, Coleman EA. Rehospitalizations among patients in the Medicare fee-for-service program. *New England Journal of Medicine* 2009;360(14):1418-28.
51. Garcia-Perez L, Linertova R, Lorenzo-Riera A, Vazquez-Diaz JR, Duque-Gonzalez B, Sarria-Santamera A. Risk factors for hospital readmissions in elderly patients: a systematic review. *Quarterly Journal of Medicine* 2011;104(8):639-51.
52. Woz S, et al. Gender as risk factor for 30 days post-discharge hospital utilisation: a secondary data analysis. *BMJ Open* 2012;2(2):e000428. DOI: 10.1136/bmjopen-2011-000428.
53. Jack BW, et al. A reengineered hospital discharge program to decrease rehospitalization: a randomized trial. *Annals of Internal Medicine* 2009;150(3):178-87.
54. Arbaje AI, Wolff JL, Yu Q, Powe NR, Anderson GF, Boulton C. Postdischarge environmental and socioeconomic factors and the likelihood of early hospital readmission among community-dwelling Medicare beneficiaries. *Gerontologist* 2008;48(4):495-504.
55. Silverstein MD, Qin H, Mercer SQ, Fong J, Haydar Z. Risk factors for 30-day hospital readmission in patients ≥65 years of age. *Proceedings (Baylor University. Medical Center)* 2008;21(4):363-72.
56. Adams-Leander S. Transcultural nursing in the community. In: Rector C, editor. *Community and Public Health Nursing Promoting the Public's Health*. 9th ed. Philadelphia, PA: Wolters Kluwer; 2018:128-64.
57. Armor BL, Wight AJ, Carter SM. Evaluation of adverse drug events and medication discrepancies in transitions of care between hospital discharge and primary care follow-up. *Journal of Pharmacy Practice* 2016;29(2):132-7. DOI: 10.1177/0897190014549836.
58. Frostick S. Pharmacological thromboprophylaxis and total hip or knee replacement. *British Journal of Nursing* 2016;25(1):45-53. DOI: 10.12968/bjon.2016.25.1.45.
59. Musculoskeletal care modalities. In: Hinkle JL, Cheever KH, editors. *Brunner & Suddarth's Textbook of Medical-Surgical Nursing*. 13th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2014:1103-31.
60. Wollan MK. Musculoskeletal trauma and orthopedic surgery. In: Lewis SL, Bucher L, Heitkemper MM, Harding MM, Kwong J, Roberts D, editors. *Medical Surgical Nursing: Assessment and Management of Clinical Problems*. 10th ed. St. Louis, MO: Elsevier; 2017:1462-95.

61. Chughtai M, Elmallah RK, Cherian JJ, Mistry JB, Harwin SF, Mont MA. Rehabilitation and pain management modalities in total knee arthroplasty. *Journal of Knee Surgery* 2016;29(3):179. DOI: 10.1055/s-0036-1580606.
62. Gleason K, Brake H, Agramonte V, Perfetti C. Medications at transitions and clinical handoffs (MATCH) toolkit for medication reconciliation. (Prepared by the Island Peer Review Organization, Inc., under Contract No. HHS2902009000 13C.) AHRQ Publication No. 11(12)-0059 [Internet] Agency for Healthcare Research and Quality. 2012 Aug Accessed at: <http://www.ahrq.gov>. [created 2011; accessed 2017 Oct 04]
63. National patient safety goals. 2018 national patient safety goals [Internet] Joint Commission on Accreditation of Healthcare Organizations. Accessed at: <http://www.jointcommission.org/PatientSafety/NationalPatientSafetyGoals/>. Updated 2017 [accessed 2017 Nov 20]
64. Roberts ME, Wheeler KJ, Neiheisel MB. Medication adherence part three: Strategies for improving adherence. *Journal of the American Association of Nurse Practitioners* 2014;26(5):281-7. DOI: 10.1002/2327-6924.12113.
65. Phatak A, et al. Impact of pharmacist involvement in the transitional care of high-risk patients through medication reconciliation, medication education, and postdischarge call-backs (IPITCH Study). *Journal of Hospital Medicine* 2016;11(1):39-44. DOI: 10.1002/jhm.2493.
66. Dusek B, Pearce N, Harripaul A, Lloyd M. Care transitions: A systematic review of best practices. *Journal of Nursing Care Quality* 2015;30(3):233-9. DOI: 10.1097/NCQ.000000000000097.
67. Care coordination and transition management (CCTM) between acute care and ambulatory care. In: Haas SA, Swan BA, Haynes TS, editors. *Care Coordination and Transition Management Core Curriculum*. Pitman, NJ: American Academy of Ambulatory Care Nursing; 2014:141-62.
68. Principles and practices of rehabilitation. In: Hinkle JL, Cheever KH, editors. *Brunner & Suddarth's Textbook of Medical-Surgical Nursing*. 13th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2014:153-81.
69. Joint replacement surgery. In: Swearingen PL, editor. *All-in-One Nursing Care Planning Resource*. 4th ed. St. Louis, MO: Elsevier; 2016:498-503.
70. Browne JA, Sandberg BF, D'Apuzzo MR, Novicoff WM. Depression is associated with early postoperative outcomes following total joint arthroplasty: a nationwide database study. *Journal of Arthroplasty* 2014;29(3):481-3. DOI: 10.1016/j.arth.2013.08.025
71. Alvi HM, Mednick RE, Krishnan V, Kwasny MJ, Beal MD, Manning DW. The effect of BMI on 30 day outcomes following total joint arthroplasty. *Journal of Arthroplasty* 2015;30(7):1113-7.



72. Jamsen E, Puolakka T, Peltola M, Eskelinen A, Lehto MU. Surgical outcomes of primary hip and knee replacements in patients with Parkinson's disease: a nationwide registry-based case-controlled study. *Bone and Joint Journal* 2014;96-B(4):486-91. DOI: 10.1302/0301-620X.96B4.33422
73. Gwahirisa JJ. Trimodal venous thromboembolism prophylaxis in total knee replacement: A quality improvement project for best care practices. *Journal of Vascular Nursing* 2015;33(3):119-26. DOI: 10.1016/j.jvn.2015.05.039.
74. Lewis SL. Inflammation and wound healing. In: Lewis SL, Bucher L, Heitkemper MM, Harding MM, Kwong J, Roberts D, editors. *Medical Surgical Nursing: Assessment and Management of Clinical Problems*. 10th ed. St. Louis, MO: Elsevier; 2017:160-77