National Imaging Associates, Inc.*	
Clinical guidelines: **KNEE ARTHROPLASTY**	**Original Date: November 2015**
CPT Codes** - **Total Knee Arthroplasty (TKA): 27447** - **Partial-Unicompartmental Knee Arthroplasty (UKA): 27438, 27446** - **Revision Knee Arthroplasty: 27486, 27487** ***See UM Matrix for allowable billed groupings and additional covered codes*	**Last Revised Date: May 2~~June 2~~0221~~1~~**
Guideline Number: NIA_CG_315	**Implementation Date: January 2023~~2~~**

General Requirements

Elective knee arthroplasty may be considered if the following general criteria are met:

- Knee pain with documented loss of function, which may include painful weight bearing, painful or inadequate range of motion to accomplish age-appropriate activities of daily living (ADLs) and/or employment, and painful mechanical catching, locking, or popping
- Individual~~Patient~~ is medically stable and optimized for surgery with no uncontrolled comorbidities (such as diabetes)
- Individual~~Patient~~ does not have an active local or systemic infection
- Individual~~Patient~~ does not have active, untreated drug dependency (including but not limited to narcotics, opioids, muscle relaxants) unless engaged in treatment program
- Individual~~Patient~~ has good oral hygiene and does not have major dental work scheduled or anticipated (ideally within one year of joint replacement), due to increased post-surgical infection risk
- ~~Efforts have been made to ensure that the patient is optimally informed and prepared for surgery~~

Clinical notes should address:

- Symptom onset, duration, and severity
- Loss of function and/or limitations

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- Type and duration of non-operative management modalities
- Discussion with patient regarding decision making and timing

Non-operative management must include at least **TWO** or more of the following unless otherwise specified in clinical indications below:

- Rest or activity modifications/limitations
- Weight reduction for individual~~patient~~ with elevated BMI
- Protected weight-bearing with cane, walker, or crutches
- Brace/orthosis
- Physical therapy modalities
- Physician-supervised exercise program (including home exercise program)
- Application of heat or ice
- Pharmacologic treatment: oral/topical NSAIDS, acetaminophen, or analgesics
- Intra-articular injection(s)

INDICATIONS

TOTAL KNEE ARTHROPLASTY (TKA)

TKA may be considered medically necessary when the following criteria are met:

- Extensive disease or damage due to rheumatoid arthritis ~~(Lee, 2012)~~,[1] post-traumatic arthritis (i.e., previous proximal tibia or distal femur fracture causing subsequent arthritis), fracture ~~(Softness, 2017)~~,[2] avascular necrosis[3] ~~(Woehnl, 2012)~~ confirmed by imaging (radiographs, MRI, or other advanced imaging) or radiographs (X-rays) demonstrate bone-on-bone articulation

  AND

- There is persistent pain and documented loss of function with any of the above.

  NOTE: There is no medical necessity to perform TKA in individual~~patient~~s with severe radiological disease and no symptoms~~.~~

  OR

- When **ALL** of the following criteria are met:
  - Pain due to advanced osteoarthritis (Kellgren-Lawrence (K-L) grade 3 or grade 4 degeneration [see grading appendix]) that is persistent and severe and/or individual~~patient~~ has documented loss of function that has been present for at least 12 weeks~~3 months~~ ~~-~~resulting in a diminished quality of life[4] ~~(Hoorntje, 2018)~~

- Failure of **at least 12 weeks~~3 months~~** of non-operative treatment, including **at least two** of the following:[5-8] ~~((Van Manen, 2012; AAOS, 2012; Felson, 1987; Hochberg, 2012):~~
  - Rest or activity modifications/limitations
  - Weight reduction for individual~~patient~~ with elevated BMI[8] ~~(AAOS, 2012)~~
  - Protected weight-bearing with cane, walker, or crutches
  - Brace/orthosis
  - Physical therapy modalities
  - Physician-supervised exercise program (including home exercise program)
  - Application of heat or ice
  - Pharmacologic treatment: oral/topical NSAIDS, acetaminophen, or analgesics[8] ~~(AAOS, 2012)~~
  - Injections: corticosteroid or viscosupplementation
- Physical exam findings demonstrate **one or more** of the following: tenderness, swelling/effusion, limited range of motion (decreased from uninvolved side or as compared to a normal joint), flexion contracture, palpable or audible crepitus, instability and/or angular deformity~~.~~
- Radiographic findings show evidence of advanced arthritic changes, described as Kellgren-Lawrence grade 3 or grade 4 degeneration or described as X-rays demonstrating advanced changes such as severe narrowing or bone-on-bone compartment collapse, subchondral sclerosis or cysts, osteophyte formation and/or bony deformity ~~(Hoorntje, 2018; Kellgren, 1957)~~.[4,9] X-rays described only as showing "severe", "advanced" or "end-stage" arthritis require more definitive descriptions as stated above. The severity of knee osteoarthritis is commonly determined with weight-bearing radiographs, however, if severe arthritic changes (e.g., bone on bone joint space narrowing) are noted on non-weightbearing images, further weight-bearing radiographs are not required

  NOTE: MRI should not be the primary radiographic test used to determine the presence or severity of arthritic changes in the joint ~~(Marsh 2013)~~.[10] Likewise, determinations as to the degree of arthritis should not routinely be determined by findings described from prior arthroscopic surgery of the knee~~.~~

- No corticosteroid injection into the joint within 12 weeks of surgery[11-15] ~~(Bedard, 2017; Cancienne, 2015; Richardson, 2019; Tang, 2021)~~
- No prior arthroscopic knee surgery within 6 months of surgery[16-20]

Additional Information

- ~~All requests for TKA or UKA must have documentation in the medical record pertaining to the potential risks, benefits, and complications specific to these procedures.~~ All requests for simultaneous bilateral total knee replacements should clearly indicate why

simultaneous TKA is preferable to staged procedures. Associated risks with simultaneous bilateral total knee replacements should also be discussed with the patient and documented in the medical record

- If medical records indicate that possibly either a TKA or a UKA will be performed, based on the findings at the time of surgery, separate requests are to be submitted

Absolute Contraindication

- Active infection (local or remote). If a local or remote infection is documented in the patient's history, records should clearly demonstrate that the previous infection has been treated and symptoms have resolved or that the individual~~patient~~ has no clinical signs or symptoms of the previous infection at the time of the operation.
- Any corticosteroid injection into the joint within 12 weeks of surgery[11-15] ~~(Bedard, 2017; Cancienne, 2015; Richardson, 2019; Tang, 2021)~~
- Any prior arthroscopic knee surgery within 6 months of surgery[16-20]

Relative Contraindication

- Prior infection at site (unless aspiration with cultures and serology [CBC with differential, ESR, CRP] demonstrates no infection). If prior infection at site, tissue biopsies should be sent intra-operatively to exclude latent/dormant infection.
- Documented allergy to any proposed component
- BMI > 40[21] ~~(D'Apuzzo, 2014)~~ without attempts at weight loss or discussion of increased risk conferred by BMI
- Severe peripheral vascular disease
- Compromised soft tissue envelope
- Uncontrolled comorbidities[22] ~~(Clement, 2013)~~

UNICOMPARTMENTAL KNEE ARTHROPLASTY (UKA) / PARTIAL KNEE REPLACEMENT (PKA)

Medial or l~~L~~ateral UKA/PKA may be medically necessary when **ALL** of the following criteria are met:

- At least 12 weeks~~3 months~~ of pain localized to the medial or lateral compartment[4] ~~(Hoorntje, 2018)~~
- Failure of at least 12 weeks~~3 months~~ of non-operative treatment, including **at least two** of the following[5-8] ~~(AAOS, 2012; Felson, 1987; Hochberg, 2012; Van Manen, 2012~~):
  - Rest or activity modifications/limitations
  - Weight reduction for individual ~~patient~~ with elevated BMI[8] ~~(AAOS, 2012)~~
  - Protected weight-bearing with cane, walker, or crutches
  - Brace/orthosis
  - Physical therapy modalities
  - Physician-supervised exercise program (including home exercise program)

- Application of heat or ice
- Pharmacologic treatment: oral/topical NSAIDS, acetaminophen, or analgesics[8] ~~(AAOS, 2012)~~
- Injections: corticosteroid or viscosupplementation

- Total arc of motion (goniometer) > 90 degrees
- Normal ACL or stable reconstructed ACL per physical exam test[23] ~~(Tinius, 2012)~~
- W~~Standing, w~~eight-bearing radiographs demonstrate *only* unicompartmental disease (with or without patellofemoral involvement), described as Kellgren-Lawrence grade 3 or grade 4 degeneration

  NOTE: MRI should not be the primary radiographic test used to determine the presence or severity of arthritic changes in the joint[10] ~~(Marsh 2013)~~
- Contracture < or equal to 10 degrees upon physical exam (goniometer)[24] ~~(Purcell, 2018)~~
- Angular deformity < or equal to 10 degrees, passively correctable to neutral upon physical exam (goniometer)[25] ~~(Becker, 2013)~~
-
- No corticosteroid injection into the joint within 12 weeks of surgery[11-15] ~~(Bedard, 2017; Cancienne, 2015; Richardson, 2019; Tang, 2021)~~
-
- No prior arthroscopic knee surgery within 6 months of surgery[16-20]

All requests for UKA in individual~~patient~~s with chronic, *painless* effusion and extensive radiographic arthritis will be evaluated on a case-by-case basis.

Contraindications for Medial or Lateral UKA/PKA

- Any corticosteroid injection into the joint within 12 weeks of surgery[11-15] ~~(Bedard, 2017; Cancienne, 2015; Richardson, 2019; Tang, 2021)~~
- Any prior arthroscopic knee surgery within 6 months of surgery[16-20]
-
- Local or systemic active infection
- Inflammatory arthritis
- Angular deformity or contracture greater than indicated range
- Significant arthritic involvement of opposite compartment
- ACL instability
- Poor bone quality or significant osteoporosis or osteopenia
- Meniscectomy of the opposite compartment, involving > 25% of meniscus
- Stiffness greater than indicated range of motion

PATELLOFEMORAL UKA/PKA may be medically necessary when **ALL** of the criteria are met within one of the following two subsections:

- Failure of prior patellofemoral unloading procedures (i.e., Maquet or Fulkerson)
- Failure of at least 12 weeks~~3 months~~ of non-operative treatment, including at least **two** of the following:
    - Rest or activity modifications/limitations
    - Weight reduction for individual~~patient~~ with elevated BMI
    - Protected weight-bearing with cane, walker, or crutches
    - Brace/orthosis
    - Physical therapy modalities
    - Physician-supervised exercise program (including home exercise program)
    - Application of heat or ice
    - Pharmacologic treatment: oral/topical NSAIDS, acetaminophen, or analgesics
    - Injections: corticosteroid or viscosupplementation
- Standing, AP or PA weight-bearing x-rays demonstrate only unicompartmental disease of the patellofemoral joint, described as Kellgren-Lawrence grade 3 or grade 4 degeneration (joint space narrowing, osteophyte formation, sclerosis and/or subchondral cystic changes), with no evidence of medial or lateral compartment arthritis.

  OR

- At least 6 months of isolated patellar/anterior knee pain
- Patellar/anterior knee pain that is exacerbated by stairs, inclines, transfers or prolonged sitting
- Reproducible patellofemoral pain upon physical exam
- No ligamentous instability upon physical exam
- Failure of **at least 12 weeks~~3 months~~** of non-operative treatment, including at least **two** of the following:
    - Rest or activity modifications/limitations
    - Weight reduction for individual~~patient~~ with elevated BMI
    - Protected weight-bearing with cane, walker, or crutches
    - Brace/orthosis
    - Physical therapy modalities
    - Physician-supervised exercise program (including home exercise program)
    - Application of heat or ice
    - Pharmacologic treatment: oral/topical NSAIDS, acetaminophen, or analgesics
    - Injections: corticosteroid or viscosupplementation

- Standing, AP, or PA weight-bearing radiographs demonstrate only unicompartmental disease of the patellofemoral joint, described as Kellgren-Lawrence grade 3 or grade 4 degeneration, with no evidence of medial or lateral compartment arthritis~~.~~
- No cortisone injection into the joint within 12 weeks of surgery[11-15] ~~(Bedard, 2017; Cancienne, 2015; Richardson, 2019; Tang, 2021)~~

  NOTE: MRI should not be the primary radiographic test used to determine the presence or severity of arthritic changes in the joint[10] ~~(Marsh, 2013)~~

Contraindications for Patellofemoral UKA/PKA:

- Any corticosteroid injection into the joint within 12 weeks of surgery[11-15] ~~(Bedard, 2017; Cancienne, 2015; Richardson, 2019; Tang, 2021)~~
- Local or systemic active infection
- Inflammatory arthritis
- Angular deformity or contracture greater than indicated range
- Significant arthritic involvement of the medial or lateral knee compartment(s)
- Ligament instability
- Poor bone quality or significant osteoporosis or osteopenia
- Stiffness greater than indicated range of motion
-

REVISION ARTHROPLASTY

Revision TKA may be considered medically necessary when the following criteria are met:

- Previous removal of infected knee prosthesis **AND** no evidence of current, ongoing, or inadequately treated knee infection (ruled out by normal inflammatory markers* (ESR and CRP) or significant improvement in these markers and a clear statement by the treating surgeon that infection has been adequately treated) AND off antibiotics[26-28] ~~(Della Valle, 2010; Lee, 2015; Ting, 2017).~~

  ***NOTE**: If these inflammatory markers are elevated, further evaluation is required, including an aspiration with synovial fluid WBC count, gram stain and cultures, or an intraoperative frozen biopsy[26] ~~(Della Valle, 2010)~~;

  OR

- When **ALL** of the following criteria are met[29,30] ~~(Goyal, 2012; Motififard, 2015)~~:
  - Symptomatic UKA/PKA or TKA as evidenced by persistent, severe, disabling pain, complaints of instability, mechanical abnormalities ("clunking" or audible crepitus), any of which result in a loss of function
  - Any of the following findings upon physical exam: tenderness to palpation objectively attributable to the implant, swelling or effusion, pain on weight-bearing or motion, instability on stress-testing, abnormal or limited motion (compared to

usual function), palpable or audible crepitus or "clunking" associated with reproducible pain

- Aseptic loosening, instability, osteolysis, progressive bone loss, or mechanical failure confirmed on radiographic or advanced imaging (bone scan, CT scan, or MRI)
- For implant loosening seen on routine X-rays or advanced imaging, documentation of no evidence of current, ongoing, or inadequately treated knee infection, ruled out by normal inflammatory markers (ESR and CRP)[27,28,31-33] ~~(Lee, 2015; Parvizi, 2010, 2013, 2018; Ting, 2017)~~
- If the revision is for obvious hardware failure only, inflammatory markers are not required
- Cases that do not demonstrate any radiographic abnormalities yet show findings of gross instability on physical examination will be evaluated on a case-by-case basis

- No corticosteroid injection into the joint within 12 weeks of surgery[11-15] ~~(Bedard, 2017; Cancienne, 2015; Richardson, 2019; Tang, 2021)~~

Additional Information

- Removal of infected knee prosthesis and subsequent insertion of antibiotic spacer is not considered a revision knee arthroplasty~~.~~
- All requests for revision TKA are to have documentation in the medical record pertaining to the potential risks, benefits, and complications specific to this procedure~~.~~

Absolute Contraindication

- Active infection (local or remote). If a local or remote infection is documented in the patient's history, records should clearly demonstrate that~~-~~ the previous infection has been treated and symptoms have resolved or that the individual~~patient~~ has no clinical signs or symptoms of the previous infection at the time of the operation~~.~~
- Any corticosteroid injection into the joint within 12 weeks of surgery[11-15] ~~(Bedard, 2017; Cancienne, 2015; Richardson, 2019; Tang, 2021)~~

Relative Contraindication:

- Unstable or poorly controlled comorbidities
- Severe peripheral vascular disease
- Compromised soft-tissue envelope (revision may be performed in conjunction with plastic surgical consultation for soft tissue coverage via pedicle flaps or other acceptable procedure)

GRADING APPENDIX

Kellgren-Lawrence Grading System:
MRI should not be the primary tool used to determine the presence or severity of arthritic changes in the joint.

Grade	Description
0	No radiographic features of osteoarthritis
1	Possible joint space narrowing and osteophyte formation
2	Definite osteophyte formation with possible joint space narrowing
3	Moderate multiple osteophytes, definite narrowing of joint space, some sclerosis and possible deformity of bone contour (*some sclerosis and cyst formation)*
4	Large osteophytes, marked narrowing of joint space, severe sclerosis and definite deformity of bone contour.

Other Notes

Manipulation following total knee arthroplasty: SEE KNEE ARTHROSCOPY & OTHER OPEN PROCEDURES Guideline for specific Manipulation indications.

BACKGROUND

KNEE ARTHROPLASTY - **Total, Partial & Revision Knee Replacement**
This guideline addresses elective, non-emergent knee arthroplasty (knee replacement) procedures, including total knee arthroplasty (TKA), unicompartmental/unicondylar knee arthroplasty (UKA) or hemiarthroplasty (partial knee replacement), and revision arthroplasty procedures.

Arthroplasty describes the surgical replacement and reconstruction of a joint with implanted devices when the joint has been damaged by an arthritic or traumatic process. A normal knee functions as a hinge joint between the femur and the tibia. The surfaces where these bones meet can become worn out over time, due to arthritis or other conditions, which can cause pain and swelling.

TKA replaces and reconstructs all articular joint surfaces. In some cases, only one surface within the knee develops arthritis and associated pain and functional loss. In these cases, a partial knee replacement may be necessary to remove and reconstruct only the damaged region of the knee.

In some cases, the knee prosthesis may wear out or loosen. If loosening is painful, a revision surgery may be necessary. In this procedure some or all of the components of the original replacement prosthesis are removed and replaced with new ones.

Overview

UNICOMPARTMENTAL KNEE ARTHROPLASTY (UKA) / PARTIAL KNEE REPLACEMENT (PKA)
Unicompartmental knee arthroplasty (UKA) is also called partial replacement, hemiarthroplasty, unicondylar knee, or bicondylar knee arthroplasty. This procedure involves reconstruction of either the medial or lateral weight bearing compartment of the knee and/or patellofemoral joint. Medial UKA is performed more frequently than lateral procedures.

REVISION ARTHROPLASTY
Revision describes surgical reconstruction due to failure or complication of a previous arthroplasty.

POLICY HISTORY

Date	Summary
May ~~June~~ 2022	• Added arthroscopic surgery within 6 months of an arthroplasty as a contraindication • Removed the risk/benefit discussion requirement • Clarified language (General Requirements) for medically stable and surgically optimized individuals~~.~~ • Revised 3-months to 12-weeks throughout • Replaced “patient” with “individual” where appropriate
June 2021	• Revised requirements for revision arthroplasty. Inflammatory markers are not required if revision is for obvious hardware failure. • Added clarification of X-ray requirements: “X-rays described only as showing “severe”, “advanced” or “end-stage” arthritis require more definitive descriptions”
October 2020	• Added: Efforts have been made to ensure that the patient is optimally informed and prepared for surgery • Altered: BMI > 40 (D’Apuzzo, 2014); without attempts at weight loss or discussion of increased risk conferred by BMI • Changed: angular deformity and flexion contracture to less than or equal to 10 degrees • Removed: BMI < 40 (Bonutti, 2011) as contraindication for UKA

	• Changed under UKA contraindication: Meniscectomy of the opposite compartment, involving > 25% of meniscus • Added: (documented with a normal erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP), or significant improvement in these markers and a clear statement by the treating surgeon that infection has been adequately treated) • Changed: The patient should be off of antibiotics at the time of pre-operative testing and aspiration, as well as re-implantation • Removed Bonutti reference • Added Molloy reference on BMI for UKA
April 2020	• Removed CPT code 27488 from Revision Knee Arthroplasty
October 2019	• Updated/revised in-text references and bibliography • Added new a statement that if "bone on bone" arthritis is documented, conservative treatment requirements are not necessary for approval. • Deleted age limit for UKA (previous age criteria: over 50) • Added:" No evidence of current, ongoing, or inadequately treated knee infection (ruled out by normal inflammatory markers (ESR and CRP)) • Removed Outerbridge Classification (this is an arthroscopic grading system) • Removed Non-covered section
August 2019	• Added CPT code 27438 for Partial-Unicompartmental Knee Arthroplasty (UKA)
November 2018	• Total Knee Arthroplasty (TKA): TKA may be considered medically necessary when the following criteria are met: Added 'post-traumatic arthritis (i.e., previous proximal tibia or distal femur fracture causing subsequent arthritis)' to separate the general fracture term into old post traumatic arthritis versus new fracture • Additional Information: Added: 1- 'If medical records indicate that possibly either a TKA or a UKA will be performed, based on the findings at the time of surgery, separate requests are to be submitted'; 2- 'All requests for TKA, UKA, or revision TKA are to have documentation in the medical record pertaining to the potential risks, benefits, and complications specific to these procedures' • Absolute Contraindication: changed 'Any injection into the joint within 3 months of surgery' to 'Any corticosteroid injection into the joint within 3 months of surgery' • Patellofemoral UKA/PKA: Modified language to include: '*Standing*, AP or PA weight-bearing *x-rays* (this used to say

	'radiographs') demonstrate only unicompartmental disease of the patellofemoral joint, described as Kellgren-Lawrence grade 3 or grade 4 degeneration *(joint space narrowing, osteophyte formation, sclerosis and/or subchondral cystic changes*), with no evidence of medial or lateral *compartment* arthritis' • Revision TKA: Added content '… if ESR and CRP are elevated, '*further evaluation is required, including an aspiration with synovial fluid WBC count, gram stain and cultures, or an intraoperative frozen biopsy*' • Revision TKA criteria: Added a physical exam to the criteria, see italicized 'Symptomatic UKA/PKA or TKA as evidenced by persistent, severe, disabling pain, *complaints of instability, mechanical abnormalities ("clunking" or audible crepitus)*'; also added clarification '*Cases that do not demonstrate any radiographic abnormalities yet show findings of gross instability on physical examination will be evaluated on a case-by-case basis*' • Added and updated references

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Reviewed / Approved by NIA Clinical Guideline Committee

~~**GENERAL INFORMATION**~~

~~It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.~~

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Reviewed / Approved by NIA Clinical Guideline Committee

GENERAL INFORMATION

It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.