INTRODUCTION:

This guideline describes surgical indications of both arthroscopy as well as open, non-arthroplasty knee surgery. Also included are indications for knee manipulation. Arthroscopy introduces a fiber-optic camera into the knee joint through a small incision for diagnostic visualization purposes. Other instruments may then be introduced to remove, repair, or reconstruct intra- and extra-articular joint pathology. Surgical indications are based on relevant subjective clinical symptoms, objective physical exam and radiologic findings, and response to previous non-operative treatments when medically appropriate. Open, non-arthroplasty knee surgeries are performed instead of an arthroscopy as dictated by the type and severity of injury and/or disease and surgeon skill/experience.

This guideline is structured with clinical indications outlined for each of the following applications: Arthroscopic: Open, non-arthroplasty: Manipulation:

a) Diagnostic knee arthroscopy
b) Debridement with or without chondroplasty
c) Meniscectomy/meniscal repair
d) Ligament reconstruction/repair
   i. Anterior cruciate ligament (ACL) reconstruction
   ii. Posterior cruciate ligament (PCL) reconstruction
   iii. Collateral ligament repair
e) Articular cartilage restoration/repair:
   i. Marrow stimulating techniques (microfracture, drilling, abrasion chondroplasty, augmented marrow-stimulation [BioCartilage])
   ii. Restorative techniques (osteochondral autograft transfer system (OATS), mosaicplasty, autologous chondrocyte implantation (ACI), osteochondral allograft implantation, minced articular cartilage allograft transplantation [DeNovo NT])
f) Synovectomy (major [2+ compartments], minor [1 compartment])
g) Loose body removal
h) Lateral release/patellar realignment
i) Manipulation under anesthesia (MUA)
j) Lysis of adhesions for arthrofibrosis of the knee

*Non-operative Treatment:
Throughout this document non-operative care* is defined as a combination of two or more of the following:

- Rest or activity modifications/limitations;
- Ice/heat;
- Protected weight bearing;
- Pharmacologic treatment: oral/topical NSAIDS, acetaminophen, analgesics, tramadol
- Brace/orthosis;
- Physical therapy modalities;
- Supervised home exercise;
- Weight optimization;
- Injections: cortisone, viscosupplementation, platelet rich plasma (PRP)

**Kellgren-Lawrence Grading System:
Grade 0: No radiographic features of osteoarthritis
Grade I: Doubtful joint space narrowing and possible osteophytic lipping
Grade II: Definite osteophyte formation with possible joint space narrowing on anteroposterior weight-bearing radiograph
Grade III: Multiple osteophytes, definite narrowing of joint space, some sclerosis and possible bony deformity
Grade IV: Large osteophytes, marked narrowing of joint space, severe sclerosis and definite bony deformity

***Outerbridge Arthroscopic Grading System
Grade 0 Normal cartilage
Grade I Softening and swelling/b blistering
Grade II Partial thickness defect, fissures < 1.5cm diameter/wide
Grade III Fissures /defects down to subchondral bone with intact calcified cartilage layer, diameter > 1.5cm
Grade IV Exposed subchondral bone

****The International Cartilage Research Society (ICRS)
Grade 0 Normal cartilage
Grade I Nearly normal. Superficial lesions.
   A. Soft indentation
   B. And/or superficial fissures and cracks
Grade II Abnormal. Lesions extending down to <50% of cartilage depth
Grade III Severely abnormal
   A. Cartilage defects extending down >50% of cartilage depth
   B. And down to calcified layer
   C. And down to, but not through the subchondral bone
   D. And blisters
Grade IV Severely abnormal (through the subchondral bone)
A. Penetration of subchondral bone but not across entire
diameter of defect
B. Penetration of subchondral bone across the full diameter of
the defect

CLINICAL INDICATIONS:

A. Diagnostic Knee Arthroscopy
Diagnostic knee arthroscopy may be medically necessary when ALL of the
following criteria are met:
• At least 3 months of knee pain with documented loss of function (deviation
from normal knee function which may include painful weight bearing,
unstable articulation, and/or inadequate range of motion (>10 degrees flexion
contracture or <90 degrees flexion or both) to accomplish activities of daily
living (ADLs), recreational activity, and/or employment (documentation of
missed days of work or modifications of work status due to injury/pain)); AND
• At least 12 weeks of non-operative care* that has failed to improve
symptoms; AND
• Clinical documentation of painful weight bearing, joint line tenderness,
effusion and/or limited motion compared to presymptomatic joint range; AND
• Indeterminate radiographs AND MRI findings.

B. Debridement with or without Chondroplasty
Debridement may be medically necessary when ALL of the following criteria are
met:
• Knee pain with documented loss of function (deviation from normal knee
function which may include painful weight bearing, unstable articulation,
and/or inadequate range of motion (>10 degrees flexion contracture or <90
degrees flexion or both) to accomplish activities of daily living (ADLs) and/or
employment (documentation of missed days of work or modifications of work
status due to injury/pain)); AND
• At least 12 weeks of non-operative care* that has failed to improve
symptoms; AND
• MRI results showing evidence of unstable chondral flap; AND
• Recurrent (more than 2) or persistent effusion(s)

OR
• Arthrofibrosis as evidence by physical exam findings of painful stiffness and
loss of motion due to proliferation of scar tissue in and around the joint.
NOTE: Imaging is not necessary, but historically has been used to determine
the diagnosis; AND
• At least 6 weeks of supervised or self-directed physical therapy that has
failed to improve symptoms.

OR
• Debridement chondroplasty for patellofemoral chondrosis when ALL of the
following criteria are met:
  o Anterior knee pain and loss of function (deviation from normal pain-
free weight bearing, stable articulation, and/or range of motion to
accomplish activities of daily living (ADLs) and/or employment); AND


o Other extra-articular or intra-articular sources of pain or dysfunction have been excluded (referred pain, radicular pain, tendinitis, bursitis, neuroma); AND

o Physical exam localizes tenderness to the patellofemoral joint with pain aggravated by activities that load the joint (single leg squat, ascending >descending stairs, and being in seated position for extended periods of time with knee flexed); AND

o Imaging (radiographs, MRI, or CT to measure tibial tubercle—trochlear groove distance)

o At least 12 weeks of non-operative care has failed to improve symptoms; AND

o No evidence of osteoarthritis (Kellgren-Lawrence** Grade 3-4 based on standing or weight-bearing radiographs and patellofemoral views))

NOTE: arthroscopic debridement with or without chondroplasty for osteoarthritis of the knee is considered NOT MEDICALLY NECESSARY unless above criteria noted.

C. Meniscectomy/Meniscal Repair

Meniscectomy and/or meniscal repair may be medically necessary when the following criteria are met:

• Symptomatic meniscal tear confirmed by MRI results that show a peripheral longitudinal tear in a vascular zone, associated with pain and mechanical symptoms upon physical exam:

  OR

• Pediatric or adolescent patient has pain and mechanical symptoms upon physical exam; AND

• MRI results show unstable tear:

  OR

• When at least 3 of the following 5 criteria are met:
  1. History of "catching" or "locking" as reported by the patient;
  2. Knee joint line pain with forced hyperextension upon physical exam;
  3. Knee joint line pain with maximum flexion upon physical exam;
  4. Knee pain or an audible click with McMurray's maneuver upon physical exam;
  5. Joint line tenderness to palpation upon physical exam; AND

• At least 6 weeks of non-operative care* that has failed to improve symptoms; AND

• One of the following radiographic findings:
  o Radiographic findings without moderate or severe osteoarthritic changes; OR
  o MRI results confirm meniscal tear in patients < 30 years of age; OR
  o MRI results confirm displaced tear (any age);

  OR

• Meniscus tear encountered during other medically necessary arthroscopic procedure
**Absolute Contraindications**
- Arthroscopic meniscectomy or meniscal repair is never medically necessary in the presence of Kellgren-Lawrence Grade 4 osteoarthritis.

**Relative Contraindications**
- Meniscectomy or repair is considered NOT MEDICALLY NECESSARY in the presence of Kellgren-Lawrence Grade 3 osteoarthritis unless acute onset with effusion, locking (note: locking only. This does not include catching, popping, cracking), and MRI evidence of bucket-handle or displaced meniscal fragment that correlates with the correct compartment (i.e. medial tenderness and locking for a medial tear).
- If grade 3 changes are present, only a meniscectomy may be indicated, not repair. If evidence of meniscal extrusion on coronal MRI with/without subchondral edema, arthroscopy is relatively contraindicated, even if tear is present.
- BMI > 35

**D. Ligament Reconstruction/Repair**

**Anterior Cruciate Ligament (ACL) Reconstruction with Allograft or Autograft:**
ACL reconstruction or repair may be medically necessary when ALL of the following criteria are met:
- Knee instability (as defined subjectively as "giving way", "giving out", "buckling", two-fist sign) with clinical findings of instability: Lachman’s 1A, 1B, 2A, 2B, 3A, 3B, Anterior Drawer, or Pivot Shift, instrumented (KT-1000 or KT-2000) laxity of greater than 3 mm side-side difference; AND
- MRI results confirm complete ACL tear; AND
- Patient has no evidence of severe arthritis (Kellgren-Lawrence** Grade 3 or 4)

OR
- When ONE of the following criteria are met:
  - MRI results confirm ACL tear associated with other ligamentous instability or repairable meniscus; OR
  - MRI results confirm partial or complete ACL tear AND patient has persistent symptoms despite at least 12 weeks of non-operative care*; OR
  - Acute ACL tear confirmed by MRI in high demand occupation or competitive athlete (as quantified by Marx activity score for athletics (any score greater than 4) and Tegner activity score for athletics and/or occupation (score greater than 2)); AND
  - Patient has no evidence of severe arthritis (Kellgren-Lawrence** Grade 3 or 4)

- Tears in patients less than age 13 will be reviewed on a case by case basis.

**Posterior Cruciate Ligament (PCL) Reconstruction:**
PCL reconstruction or repair may be medically necessary when ALL of the following criteria are met:


• Knee instability (as defined subjectively as "giving way", "giving out", "buckling", two-fist sign) with clinical findings of positive Posterior Drawer, posterior Sag, or quadriceps active, or Dial test at 90 degrees knee flexion, reverse pivot shift test: AND
• MRI results confirm complete PCL tear: AND
• Failed non-operative care (bracing in full extension successful in acute PCL tears): AND
• Absence of medial and patellofemoral K-L grade 3-4 changes in chronic tears; OR

• The following clinical scenarios will be considered and decided on a case-by-case basis:
  o pediatric and adolescent tears in patients with open physes or open growth plates
  o symptomatic partial tears with persistent instability despite non-operative care
  o incidental Kellgren-Lawrence Grade 2-3 osteoarthritis in acute/subacute tears with unstable joint

• Tears in patients less than age 13 will be reviewed on a case by case basis.

Collateral Ligament Repair or Reconstruction:
Collateral ligament repair or reconstruction should rarely occur independent of additional repair or reconstruction surgery. All non-traumatic collateral ligament repair/reconstruction requests will be reviewed on a case by case basis.

E. Articular Cartilage Restoration/Repair
Skeletally Immature Indications:
• When ALL of the following criteria are met:
  o Skeletally immature patient: AND
  o Patient is symptomatic (pain, swelling, mechanical symptoms of popping, locking, catching, or limited range of motion): AND
  o Radiographic findings (any radiograph and MRI) of a displaced lesion: OR

• When ALL of the following criteria are met:
  o Skeletally immature patient: AND
  o Patient is symptomatic (pain, swelling, mechanical symptoms of popping, locking, catching, or limited range of motion): AND
  o At least 12 weeks of non-operative care* has failed to improve symptoms: AND
  o Radiographic findings (any radiograph and MRI) results finding of a stable osteochondral lesion

• When ALL of the following criteria are met:
  o Skeletally immature: AND
  o Asymptomatic: AND
At least 12 weeks of non-operative care has failed to improve lesion stability or size: AND
Radiographic findings (any radiograph and MRI) results finding of an unstable osteochondral lesion

AND

Exclude patients with evidence of meniscal deficiency and/or malalignment IF these are not being addressed (meniscal transplant and/or lateral release/patellar realignment procedure) at the same time as the cartilage restoration procedure.

**Skeletally Mature Indications, Listed By Surgical Approach:**

- Reparative marrow stimulation techniques (microfracture & drilling. Abrasion arthroplasty is including in coding but is not indicated) may be medically necessary when ALL of the following criteria are met:
  - Skeletally mature adult: AND
  - MRI confirms a full-thickness weight-bearing lesion that is < 2.5 sq.cm: AND
  - Patient is symptomatic (pain, swelling, mechanical symptoms of popping, locking, catching, or limited range of motion): AND
  - Patient is less than 50 years of age: AND
  - BMI < 35 (optimal outcomes if patient BMI <30): AND
  - Physical exam findings and/or (imaging) results confirm knee has stable ligaments: AND
  - No evidence of prior meniscectomy in same compartment (medial femoral condyle full thickness lesion and prior medial meniscectomy) unless concurrent meniscal transplant performed.

OR

- Restorative techniques (abrasion arthroplasty, osteochondral autograft transfer or transplantation (OATS), mosaicplasty, autologous chondrocyte implantation (ACI), osteochondral allograft implantation, minced articular cartilage allograft transplantation [DeNovo NT]) may be medically necessary when ALL of the following criteria are met:
  - Skeletally mature adult: AND
  - MRI results confirm a full thickness chondral or osteochondral lesion of the femoral condyles or trochlea > 2.5 cm: AND
  - Patient is less than 50 years of age: AND
  - Patient has been symptomatic (pain, swelling, mechanical symptoms of popping, locking, catching, or limited range of motion) for at least 6 months: AND
  - At least 6 months of non-operative care* has failed to improve symptoms: AND
  - MRI and/or physical findings confirm knee has normal alignment as defined as +/- 3 degrees from neutral on full-length mechanical axis long-leg x-ray (unless concurrent or staged tibial or femoral osteotomy performed) and stability (unless concurrent ligamentous repair or reconstruction performed): AND
  - BMI < 35 (optimal outcomes if patient BMI <30): AND
o MRI shows no evidence of significant osteoarthritis (greater than Kellgren-Lawrence Grade 2): AND
o No prior meniscectomy in same compartment (unless concurrent or staged meniscal transplant performed)

OR

- Surgical intervention for the treatment of patellofemoral chondrosis (osteochondral autograft transfer or transplantation (OATS), microfracture, autologous chondrocyte implantation (ACI), osteochondral allograft implantation, minced articular cartilage allograft transplantation [DeNovo NT], debridement chondroplasty, tibial tubercle osteotomy) may be medically necessary when ALL of the following criteria are met:
  o Anterior knee pain and loss of function (deviation from normal knee function which may include painful weight bearing, unstable articulation, and/or inadequate range of motion (>10 degrees flexion contracture or <90 degrees flexion or both) to accomplish activities of daily living (ADLs), recreational activity, and/or employment (documentation of missed days of work or modifications of work status due to injury/pain)); AND
  o Other extra-articular or intra-articular sources of pain or dysfunction have been excluded (referred pain, radicular pain, tendinitis, bursitis, neuroma); AND
  o Physical exam localizes tenderness to the patellofemoral joint with pain aggravated by activities that load the joint (single leg squat, descending > ascending stairs or stair climbing, and being in seated position for extended periods of time with knee flexed); AND
  o Radiologic imaging shows patellofemoral chondrosis graded 3 or 4 by the Outerbridge Classification*** or ICRS**** (grade 3-4) classification
  o At least 6 months of non-operative care has failed to improve symptoms; AND
  o No evidence of osteoarthritis (Kellgren-Lawrence** Grade 3-4 based on standing or weight-bearing radiographs) in the medial/lateral compartments

F. Synovectomy (major [2+ compartments], minor [1 compartment])
Synovectomy may be medically necessary when ALL of the following criteria are met:
- Proliferative rheumatoid synovium (in patients with established rheumatoid arthritis according to the American College of Rheumatology Guidelines); AND
- Not responsive to disease modifying drug (DMARD) therapy for at least 6 months and at least 6 weeks of non-operative care that has failed to improve symptoms; AND
- At least one instance of aspiration of joint effusion and cortisone injection (if no evidence of infection):

OR
• Hemarthrosis from injury, coagulopathy or bleeding disorder confirmed by physical exam, joint aspiration, and/or MRI:

   **OR**

• Proliferative pigmented villonodular synovitis, synovial chondromatosis, sarcoid synovitis, or similar proliferative synovial disease, traumatic hypertrophic synovitis confirmed by history, MRI or biopsy; AND

• At least 6 weeks of non-operative care* that has failed to improve symptoms; AND

• At least one instance of aspiration of joint effusion and injection of cortisone (if no evidence of infection);

   **OR**

• Detection of painful plica confirmed by physical exam and MRI findings; AND

• At least 12 weeks of non-operative care* that has failed to improve symptoms.

• At least one instance of aspiration of joint effusion OR single injection of cortisone (effusion may not be present with symptomatic plica):

**G. Loose Body Removal**

Loose body removal may be medically necessary when the following criteria are met:

• Removal of loose body or foreign object that causes limitation or loss of function (deviation from normal knee function which may include painful weight bearing, unstable articulation, and/or inadequate range of motion (>10 degrees flexion contracture or <90 degrees flexion or both) to accomplish activities of daily living (ADLs), recreational activity, and/or employment (documentation of missed days of work or modifications of work status due to injury/pain)).

**H. Lateral Release/Patellar Realignment**:

This guideline describes indications for surgical procedures to address patellofemoral pain disorders and abnormal alignment of the extensor mechanism of the knee by arthroscopic and/or open surgical techniques. Surgical indications are based on relevant clinical symptoms, physical exam, radiologic findings, and response to non-operative management when medically appropriate.

Surgical intervention for the treatment of **lateral patellar compression syndrome** is indicated when the following criteria are met:

o Evidence of lateral patellar tilt from radiologic images (patellofemoral view: mercer merchant (45-60 degrees flexion); skyline (60-90 degrees flexion); sunrise (60-90 degrees flexion); AND

o Associated lateral patella facet K-L changes grade 1, 2, or 3; AND

o Reproducible isolated lateral patellofemoral pain with patellar tile test; AND

o At least 6 months of non-operative care* has failed to improve symptoms including appropriate hamstring/IT band stretching and patellar mobilization techniques; AND

o No evidence of patellar dislocation without documented patellar tilt; AND
No evidence of medial patellofemoral changes (Kellgren-Lawrence Grade 2 osteoarthritis or higher):

Surgical intervention for the treatment of **patellar malalignment and/or patellar instability** is indicated when the following criteria are met:

- Acute traumatic patellar dislocation is associated with an osteochondral fracture, loose body, vastus medialis obliquus/medial patellofemoral ligament muscle avulsion, or other intra-articular injury that requires urgent operative management; OR
- Repeat (greater than 2) patellar dislocations or subluxations have occurred despite 6 months of non-operative care* with radiologic confirmation of MPFL (medial patellofemoral ligament) deficiency; OR
- Physical exam has patellofemoral tenderness and abnormal articulation of the patella in the femoral trochlear groove (patellar apprehension with positive J sign); AND
- Radiologic images rule out fracture or loose body, and show abnormal articulation, trochlear dysplasia, or other abnormality related to malalignment; AND
- CT scan or MRI rules out other abnormality to malalignment (tibial tubercle-trochlear groove (TT-TG) distance > 20 millimeters); AND
- At least 6 months of non-operative care* has failed to improve symptoms

**I. Manipulation under Anesthesia (MUA)**

Manipulation under anesthesia (MUA) may be indicated when the following criteria are met:

- Physical exam findings demonstrate inadequate range of motion of the knee defined as less than 105 degrees of flexion; AND
- Failure to improve range of motion of the knee despite 6 weeks (12 visits) of documented physical therapy; AND
- Patient is **less than 12 weeks** after ligamentous or joint reconstruction.

**J. Lysis of Adhesions for Arthrofibrosis of the knee**

Surgical indications are based on relevant clinical symptoms, physical exam, radiologic findings, time from primary surgery, and response to conservative management when medically appropriate. Improved range of motion may be accomplished through arthroscopically-assisted or open lysis of adhesions with general anesthesia, regional anesthesia, or sedation.

- Physical exam findings demonstrate inadequate range of motion of the knee, defined as less than 105 degrees of flexion; AND
- Failure to improve range of motion of the knee despite 6 weeks (12 visits) of documented physical therapy; AND
- Patient is **more than 12 weeks** after ligamentous or joint reconstruction, or resolved infection; OR
- Patient is **more than 12 weeks** after trauma, or resolved infection; AND
- Patient has native knee; AND
- Manipulation under anesthesia is also performed
REFERENCES


