Consensus Statement

Position Statement From the Australian Knee Society on Arthroscopic Surgery of the Knee, Including Reference to the Presence of Osteoarthritis or Degenerative Joint Disease

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Australian Knee Society*

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Arthroscopic debridement and/or lavage has been shown to have no beneficial effect on the natural history of osteoarthritis (OA), nor is it indicated as a primary treatment in the management of OA. However, this does not preclude the judicious use of arthroscopic surgery, when indicated, to manage symptomatic coexisting abnormalities in the presence of OA or degeneration. Partial medial meniscectomy is not indicated as an initial treatment for atraumatic tears of degenerative menisci, excluding bucket-handle tears and surgeon-assessed locked or locking knees.

ARTHROSCOPIC SURGERY IN THE PRESENCE OF OSTEOARTHRITIS OR DEGENERATION

There are certain clinical scenarios in which arthroscopic surgery, in the presence of OA, may be appropriate. These include, but are not necessarily limited to, the following:

- known or suspected septic arthritis;
- symptomatic nonrepairable meniscal tears after the failure of an appropriate trial of a structured rehabilitation program;
- symptomatic loose bodies;
- surgeon-assessed locked or locking knees;
- traumatic or atraumatic meniscal tears that require repair;
- inflammatory arthropathy requiring synovectomy;
- synovial abnormalities requiring biopsy or resection;
- large unstable chondral abnormalities causing surgeon-assessed locking or locked knees;
- as an adjunct to, and in combination with, other surgical procedures as appropriate for OA (eg, high tibial osteotomy and patellofemoral realignment); and
- diagnostic arthroscopic surgery when the diagnosis is unclear on magnetic resonance imaging (MRI) or MRI is not possible and the symptoms are not of OA.

The decision to proceed with arthroscopic surgery in the presence of OA or degeneration should be made by the treating orthopaedic surgeon:

- after a careful review of the clinical scenario, particularly the assessment of the relative contributions of OA and the arthroscopically treatable abnormality, to the patient’s symptoms;
- with knowledge of the relevant evidence base, as listed in this work;
- after an appropriate trial of structured rehabilitation; and
- after a thoughtful discussion with the patient about the relative merits of the procedure versus ongoing nonoperative treatment.

DEFINITIONS

OA, or degenerative joint disease, is a progressive clinical disorder of joints characterized by gradual diffuse loss of articular cartilage, effects on the underlying bone, and
secondary compromise of joint function. This should be distinguished from focal articular cartilage abnormalities in an otherwise normal joint.

There is a spectrum of severity of OA from minor partial-thickness articular cartilage abnormalities to large areas of full-thickness loss. Clinical decision making requires a careful assessment of the degree of arthritis, its likely contribution to the symptoms, and the potential contribution of additional abnormalities to those symptoms.

The concept of degenerative versus traumatic, in regard to meniscal lesions and tearing, is arbitrary. No universally accepted definition of degeneration or degenerative change exists, and commonly used clinical diagnostic descriptors lack validity.

**ASSESSMENT AND INTERPRETATION OF MRI**

While plain radiography is the preferred initial imaging modality, MRI remains an excellent adjunct both to clinical decision making and to guiding the use of surgery. In particular, it can be used to more accurately assess the degree of arthritis and to look for and assess additional abnormalities that may correlate with a patient’s symptoms. MRI scans should be interpreted carefully by the treating surgeon, in combination with direct review of the imaging, when determining the clinical relevance of the findings. MRI descriptions of meniscal tearing, degeneration, and lesions in the absence of trauma lack validity. Further information on the appropriate radiological investigation of knee OA can be obtained from the statement, “Joint AKS-AMSIG Submission to the Australian Commission on Quality and Safety in Healthcare on the Radiological Investigation of Knee Osteoarthritis” (http://www.kneesociety.org.au/resources/Joint-AKS-AMSIG-submission-ACQSH-investigation-knee-osteoarthritis.pdf).

**SYSTEMATIC REVIEW: ARTHROSCOPIC SURGERY IN THE PRESENCE OF OSTEOARTHRITIS**

**Introduction**

Our aim was to examine the evidence of effectiveness, inclusion and exclusion criteria, effects of age, and adverse events in existing knee arthroscopic surgery randomized controlled trials (RCTs), with a view to the formulation of clinical indication guidelines based on International Classification of Diseases–10th Revision (ICD-10) codes for knee arthroscopic surgery in the presence of degeneration or OA.

**Methods**

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement for systematic reviews was utilized for this work.11

**Literature Search and Study Selection.** In December 2015, a systematic search for clinical indications in Medline, Embase, CINAHL, and the Cochrane Central Register of Controlled Trials was undertaken. The keywords “arthroscopy” and “knee,” or variations of them, were used. Limitations to clinical trials and human studies were applied. No search restrictions for follow-up time, study size, or date of publication were set.

**Eligibility Criteria.** The inclusion and exclusion criteria were as follows.

**Inclusion criteria:**

1. RCTs assessing the effectiveness of arthroscopic surgery involving meniscal surgery, débridement, chondroplasty, loose body removal, or any combinations, with or without clinical or radiographic OA, compared with nonoperative treatment, sham surgery, or lavage.
2. English-language reports.
3. Publication in a peer-reviewed journal.

**Exclusion criteria:**

All criteria for inclusion had to be satisfied, and other systematic reviews or meta-analyses were excluded.

**Data Extraction.** Titles and/or abstracts of studies that were retrieved using the search strategy were screened independently by 2 review authors to identify studies that potentially met the inclusion criteria. The full-text versions of these potentially eligible studies were retrieved and independently assessed for eligibility by the 2 review team members. Any disagreement over the eligibility of a particular study was resolved through consensus with the addition of a third reviewer.

A standardized form was used to extract data from the included studies for the assessment of study quality and evidence synthesis. Extracted information included study population, primary diagnosis, inclusion criteria, exclusion criteria, details of the intervention, details of the comparator, study methodology, outcomes and times of measurement, and power analysis. Two review authors extracted the data independently.

If 2 separate studies with the same authors and the same intervention had overlapping dates of patient enrollment, then only 1 study was included. In this situation, the reviewer selected the study with the longer follow-up. If a different data analysis or subanalysis was undertaken, then the supplemental study was included.

**ICD-10 Diagnosis Matching.** ICD-10–Clinical Modification (ICD-10-CM) codes or ICD-10–Procedure Coding System (ICD-10-PCS) codes were matched by 2 review authors to the inclusion and exclusion criteria of all matched studies. ICD-10-CM codes were developed by the United States Centers for Disease Control and Prevention in conjunction with the National Center for Health Statistics for outpatient medical coding and reporting, as published by the World Health Organization. ICD-10-PCS codes were developed by the United States Centers for Medicare and Medicaid Services as a system of procedural codes to classify all health interventions by medical professionals.1

**Results**

**Knee Arthroscopic Surgery Outcome Studies.** Fourteen RCTs of arthroscopic knee surgery (Table 1) fulfilled the
| Author                        | Year | Primary Diagnosis                        | Intervention | Mode of Investigation | Inclusion Criteria                                                                                                                                                                                                 | Mode of Investigation | No. of Patients | Control | OA Rating on Radiographs | Joint-Specific Exclusion Criteria                                                                 | Crossover, % | Power Analysis | Notes | Outcomes |
|-------------------------------|------|------------------------------------------|--------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------|---------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------|--------|----------|
| **OA studies**                |      |                                          |              |                      |                                                                                                                                                                                                                        |                      |                 |         |                          |                                                                                                                                                                   |             |               |        |          |
| Merchan and Galindo          | 1993 | Mild OA with other intra-articular abnormalities | Synovectomy, debridement, APM, chondroplasty, excision of osteophytes, PT | Radiographs | Painful "limited" OA, including patients with meniscal tears, loose bodies, and synovitis                                                                                                                                  | NS                    | 73               | NS      | Ahlbach grade 0-1, KL grade 1-2 | Duration of pain >6 mo, body weight >65 kg in men and >70 kg in women, previous surgery, instability or an angular deformity >15°, patellofemoral OA | NS          | No            | OM modified for Special Surgery knee score; APM performed in 31/35; power >0.8 | Favored AS at 1-3 y (mean, 25 mo) |
| Chang et al                   | 1993 | OA                                       | APM, chondroplasty, synovectomy | Radiographs | Pain at 3 mo after rehabilitation                                                                                                                                                                                        | NS                    | 32               | NS      | KL grade 1-3               |                                                                                                                                                                   | NS          | No            | Inadequate power; 50% had KL grade 3 | No difference at 32 mo |
| Hubbard                      | 1996 | Symptomatic single medial femoral condyle degenerative chondral lesion (Outerbridge grade 3 or 4) | Chondroplasty, no APM | Radiographs | Symptomatic OAI >1 y, no laxity or no deformity, full ROM, single medial femoral condyle degenerative lesion (Outerbridge grade 3 or 4), no other intra-articular abnormality, normal plain radiograph findings, modified Lysholm score <38/70 | NS                    | 76               | NS      | KL grade 0               | Degenerative lesions on other joint surfaces, other intra-articular abnormality, radiographic loss of joint space, previous surgery, steroid injection for any reason, MMT or tibial degeneration | NS          | No            | OM = binary self-described pain (presence/absence) and modified Lysholm score; power >0.8 | Favored AS at 1 and 5 y |
| Moseley et al                 | 2002 | Tricompartmental OA                       | APM, chondroplasty | Radiographs | Ages <75 y, moderate knee pain that failed 6 mo of medical management with VAS pain score >3, diagnosis of OA based on ACR classification                                                                                     | NS                    | 180              | NS      | KL grade 3-4               | Scoring >9 by KL grade in 3 compartments                                                                                                                                 | Yes         | 3-arm study; in lavage group, "mechanically important, unstable tears" were debrided; in sham group, joint not entered; OM = bespoke knee-specific pain scale, Arthritis Impact Measurement Scales–2, and SF-36 | No difference at 2 y between 3 groups |
| Kirkley et al                 | 2008 | Symptomatic moderate to severe OA         | Synovectomy, debridement, APM, chondroplasty, excision of osteophytes, PT | Radiographs and MRI | Ages >18 y with articular or secondary OA (KL grade 2-4)                                                                                                                                                               | NS                    | 188              | NS      | KL grade 0-4               | Large meniscal tears, bucket-handle tears, prior major knee trauma, inflammatory or postinfectious arthritis, deformity >5°, KL grade 4 in 2 compartments | 0           | Yes           | OM = WOMAC and SF-36                                                                 | No difference at 2 y |
| Yim et al                     | 2013 | Symptomatic horizontal degenerative MMT   | APM, PT       | MRI                  | Horizontal degenerative MMT on MRI, daily knee pain on medial side with mechanical symptoms, failed nonoperative management                                                                                       | NS                    | 108              | NS      | KL grade 0-1               | Definite trauma, ligament deficiency, systemic arthritis, KL grade 2-4, osteonecrosis, meniscal repair, abrasion arthroplasty, subchondral drilling, cartilage    | 2           | Yes           | No meniscal repair or total meniscectomy undertaken; OM = VAS, Lysholm score, and Tegner score                                                                 | Favored AS at 3 mo; no difference at 2 y; meniscal tear pattern described |

(continued)
### TABLE 1 (continued)

| Author (Year) | Primary Diagnosis | Intervention | Mode of Investigation | Inclusion Criteria | No. of Patients | Not Enrolled, % | OA Rating on Radiographs | Exclusion Criteria | Joint-Specific Exclusion Criteria | Crossover, % | Power Analysis | Notes | Outcomes |
|---------------|-------------------|--------------|-----------------------|--------------------|-----------------|----------------|-------------------------|------------------|-------------------------------|-------------|---------------|-------|----------|
| Østera˚s et al (2013) | Symptomatic degenerative MMT confirmed on MRI and AS | APM, PT | Radiographs and MRI | Age 35-65 y, knee pain >3 mo that was unresponsive to conventional conservative treatment, clinical findings consistent with an MMT | 146 | Sham surgery, PT | KL grade 0-1 | Trauma-induced onset of symptoms; locked or recently locking knee; decreased ROM; instability; abnormality other than degenerative knee disease requiring treatment other than APM, meniscal repair, and microfracture to chondral defect; major chondral flap, clinical OA based on ACR classification, KL grade >3 | 6.6 | Yes | No difference at 12 mo; “results are directly applicable only to patients with nontraumatic degenerative medial meniscus tears” | | |
| Katz et al (2013) | Symptomatic degenerative MMT with mild to moderate OA | APM, chondroplasty, PT | Radiographs and MRI | Age >45 y, ≥1 mo of symptoms; imaging evidence of mild to moderate knee OA; symptoms of the following: clicking, catching, popping, giving way, pain with pivot or torque, pain that is episodic, pain that is acute and localized to one joint line, KL grade 0-3 | 330 | PT | KL grade 0-3 | Chemically locked knee, KL grade 4, clinically symptomatic chondrocalcinosis, bilateral symptomatic meniscal tears, prior surgery on same knee | 30.2 | Yes | Similar improvement in WOMAC score in failed PT once crossed over to APM; treatment success defined as >8-point improvement on WOMAC physical function scale; meniscal tear pattern not described | | |
| Herrlin et al (2013) | MRI-verified degenerative MMT | APM, chondroplasty, PT | Radiographs and MRI | Age 45-60 y, daily medial pain over 2-6 mo | 96 | PT | Ahlbach grade 1, Outerbridge grade 1-4 | History of trauma, OA of Ahlbach grade >1, rheumatoid arthritis, loose bodies, knee instability, osteochondral defects and tumors, TKA, prior knee surgery in past year | 33 | Yes | No difference in OA progression noted between 2 groups; OM = KOOS; Lysholm score, and VAS; similar PROM improvements in PT and APM; meniscal tear pattern not described | | |
| Vermosan et al (2013) | MRI-verified degenerative MMT and radiographic OA | APM, chondroplasty, PT | MRI | Nontraumatic symptomatic knee with degenerative lesions in medial compartment on MRI | 120 | Corticosteroid injection | NS NS NS | No difference at 2 and 5 y; 33% of PT group crossed over to APM with similar benefit to APM group and rest of PT group at 2 and 5 y; this subgroup had significantly lower PROM scores than rest of PT group before APM | NS | No | OM = Oxford Knee Score; post hoc power analysis >0.8 (α = 0.05); 2-tailed, P = 0.05; meniscal tear pattern not described | Better scores in surgical group at 3 mo; no difference at 12 mo | |
| Østera˚s et al (2012) | MRI-verified degenerative MMT and radiographic OA | APM | MRI | Age 35-60 y | 17 | PT | KL grade 0-2 | Anterior cruciate ligament tears, acute trauma, KL grade 3-4, hemarthrosis, locking knee | 0 | Yes | Inadequate power based on authors’ own power analysis; OM = VAS and KOOS | | |
| Gauffin et al (2014) | Symptomatic MMT | APM, chondroplasty | Radiographs | Age 45-64 y, symptoms of MMT >3 mo (Ahlback grade 0), prior PT | 150 | PT | Ahlbach grade 0, KL grade 1-2 | Locked/locking knee, chonic disease | 21.3 | Yes | OM = KOOS, EuroQol 5-Dimensions Questionnaire, Physical Activity Scale, and symptom satisfaction scale; meniscal tear pattern not described | Favorable AS at 12 mo | |
TABLE 1 (continued)

| Author (Year) | Primary Diagnosis | Intervention | Inclusion Criteria | Mode of Investigation | No. of Patients | Control | Not Enrolled, OA Rating on Radiographs | Joint-Specific Exclusion Criteria | Crossover, % | Power Analysis | Notes | Outcomes |
|---------------|-------------------|--------------|-------------------|----------------------|----------------|---------|--------------------------------------|----------------------------------|-------------|-------------|--------|----------|
| Sihvonen et al14 (2016) | Symptomatic degenerative MMT confirmed on MRI and AS; subgroup analysis of original Sihvonen et al15 (2013) study of patients with mechanical symptoms | APM, PT | Age 18-65 y, knee pain >3 mo that was unresponsive to conventional conservative treatment, clinical findings consistent with an MMT with mechanical symptoms | Radiographs and MRI | 69 | Sham surgery, PT | NS KL grade 0-1 | Trauma-induced onset of symptoms; locked or recently locking knee; decreased ROM; instability; abnormality other than degenerative knee disease requiring treatment other than APM; meniscal repair, and microfracture to chondral defect; meniscal repair; major chondral flap, clinical OA based on ACR classification; KL grade >1 | 2.5 | No | No difference at 12 mo; “this subgroup analysis is likely to be underpowered”; post hoc analyses study questions were not included a priori as primary or secondary objectives of original trial |
| Patellofemoral pain study | Chondroplasty | Age 18-40 y; female or male; symptoms lasting at least 6 mo; patellofemoral pain during knee loading, physical activity, or prolonged flexion | NS | PT | 56 | KL grade 0 | Prior knee surgery, patellar dislocation, osteochondritis dissecans, patellar tendinopathy, OA, loose bodies, instability | No difference at 2 and 5 y | OM = VAS, Lysholm score, and WOMET |

ACR, American College of Rheumatology; APM, arthroscopic partial meniscectomy; AS, arthroscopic surgery; ACR, American College of Rheumatology; APM, arthroscopic partial meniscectomy; AS, arthroscopic surgery; KL, Kellgren-Lawrence; KOOS, Knee Injury and Osteoarthritis Outcome Score; MMT, medial meniscal tear; MRI, magnetic resonance imaging; NS, not stated; OA, osteoarthritis; OM, outcome measure; PROM, patient-reported outcome measure; PT, physical therapy; ROM, range of motion; SF-36, Short Form–36; TKA, total knee arthroplasty; VAS, visual analog scale; WOMAC, Western Ontario and McMaster Universities Osteoarthritis Index; WOMET, Western Ontario Meniscal Evaluation Tool.

search criteria (Figure 1) in 3 different primary clinical ICD-10 diagnosis categories (Table 2). In 4 studies, the primary clinical diagnosis was OA2,9,10,12 (ICD-10 code M17.9). In the study by Hubbard,4 the primary clinical diagnosis was a single medial femoral condyle degenerative chondral lesion; however, not enough information was provided by the author to allow the classification of the degenerative chondral lesion as clinical OA.

In 8 studies, the primary clinical diagnosis was a symptomatic degenerative atraumatic medial meniscal tear (MMT)4,5,7,13-15,17,18 (ICD-10 code M23.2) in the presence of chondral degeneration of various degrees. In the study by Kettunen et al,8 the primary clinical diagnosis was patellofemoral pain (ICD-10 code M22.4).

Three RCTs were assessed as having inadequate power for the primary outcome measure. Osterás et al13 examined arthroscopic partial medial meniscectomy in the presence of knee OA compared to physical therapy. They included a power analysis; however, the final number of patients in their study was less than stated to achieve adequate power. Chang et al15 lacked a power analysis; however, a post hoc power analysis using G*Power3 revealed that the study was inadequately powered (power <0.8) to confirm the self-described meaningful improvement of a reduction of >1 cm from the baseline visual analog scale score. Sihvonen et al14 provided a post hoc subgroup analysis of patients from their original 2013 RCT15 who suffered self-described mechanical symptoms, defined as catching and clicking excluding locked or recently locked knees. The authors stated that the subgroup analysis was underpowered.

Three studies favored an arthroscopic intervention at final follow-up: 2 OA studies6,10 and 1 MMT study.4 The remaining 11 studies reported no outcome difference compared to the control intervention.

Risk of Bias Assessment. Studies were rated for their risk of bias in Table 3. There were no studies with a low risk of bias in all 7 risk domains assessed in the OA studies and patellofemoral pain studies.10 In the MMT studies, there was only 1 study with a low risk of bias15 in all domains.

Exclusion Criteria in MMT Studies. In the 8 studies with a primary clinical diagnosis of an MMT, 5 studies excluded surgeon-assessed locked or locking knees,4,7,13-15, and 1 study excluded loose bodies,5 with Vermesan et al17 not stating any exclusion criteria (Table 4). The Sihvonen et al13 (2003) and Sihvonen et al14 (2016) studies excluded surgeon-assessed locked or recently locked knees and major chondral flaps but included knees with patient-reported catching and locking symptoms. Yim et al18 and Katz et al17 also included patients with mechanical symptoms.
A history of traumatic onset was an exclusion criterion in 6 MMT studies, with Vermesan et al not stating any exclusion criteria. No study included meniscal repair as a management intervention, and meniscal repair was an exclusion criterion in 3 studies. No study included diagnostic arthroscopic surgery. Inflammatory joint disorders were excluded in 4 studies or were not an inclusion criterion in the remainder.

Exclusion Criteria in OA Studies. Merchan and Galindo excluded patients with pain longer than 6 months, male patients with a weight over 85 kg, female patients weighing greater than 70 kg, instability, or an angular deformity greater than 15°. Hubbard excluded any other intra-articular lesions except for symptomatic medial femoral condyle degenerative lesions in patients with no radiographic OA. Moseley et al added the Kellgren-Lawrence grade for each compartment together, excluding the patients with a score of greater than 9. Kirkley et al excluded patients with large meniscal tears, bucket-handle tears, prior major knee trauma, inflammatory or postinfectious arthritis, deformity >5°, or Kellgren-Lawrence grade 4 in 2 compartments.

Types of MMTs. Only the study by Yim et al described the MMT pattern; the remainder grouped all MMT patterns together as atraumatic degenerative. Sihvonen et al described an atraumatic sudden symptom–onset subgroup that did no better with a surgical intervention.

Crossover Into Surgical Group. None of the OA studies described crossover into the surgical group. Seven of the 9 MMT studies described crossover into the surgical group of 0%, 2%, 2.5%, 6.6%, 21.3%, 30.2%, and 33.3%. Reasons for crossover into the surgical group were either those of persistent symptoms or were not given. Herrlin et al and Katz et al stated that patients who crossed over into the surgical group had significantly worse symptoms than the remainder of the control group before crossing over but achieved similar outcomes to the control and surgical groups.

Effect of Age. Only 1 study specifically examined the effect of age on outcomes. Gauffin et al reported better outcomes for both rehabilitation and arthroscopic interventions for 55- to 64-year-old patients compared to younger patients aged 45 to 55 years.

Adverse Events. No study described a greater rate of adverse events in the arthroscopic group.

Lateral Meniscal Tears. No study examined outcomes of partial meniscectomy as a treatment for lateral meniscal tears.

Outcomes of Patients With Atraumatic MMTs Who Failed Nonoperative Management. The inclusion criteria
TABLE 2

Inclusion and Exclusion Criteria in Arthroscopic Knee Surgery RCTs Using ICD-10 Codes

| Clinical diagnoses included in RCTs |
|-----------------------------------|
| Unilateral osteoarthritis of knee²,⁴,¹⁰ |
| M17.9: Osteoarthritis of knee, unspecified |
| M17.0: Bilateral primary osteoarthritis of knee |
| M17.1: Unilateral primary osteoarthritis of knee |
| Atraumatic degenerative tears to medial meniscus⁵,¹⁴-¹⁷ |
| M23.2: Derangement of meniscus due to old tear or injury |
| M23.22: Derangement of posterior horn of medial meniscus due to old tear or injury |
| M23.30: Other meniscus derangements, unspecified meniscus |
| M23.32: Other meniscus derangements, posterior horn of medial meniscus |
| Patellofemoral chondropathy¹³ |
| M22.4: Chondromalacia patella |

| Clinical diagnoses excluded from RCTs⁶ (continued) |
|-----------------------------------------------|
| M23.23: Derangement of other medial meniscus due to old tear or injury |
| M87.88: Osteonecrosis |
| Meniscal cysts¹⁵ |
| M23.0: Cystic meniscus |
| Nonosteoarthritic arthropathies²,⁴,⁵,¹⁰,¹⁴,¹⁵,¹⁷ |
| M00.06: Staphylococcal arthritis, knee |
| M00.86: Arthritis due to other bacteria, knee |
| M02.86: Other reactive arthropathies, knee |
| M02.36: Reiter disease, knee |
| M05.76: Rheumatoid arthritis of knee |
| M10.06: Idiopathic gout, knee |
| M11.06: Hydroxyapatite deposition disease, knee |
| M12.26: Villonodular synovitis (pigmented), knee |
| Traumatic meniscal injury,¹⁰,¹⁵-¹⁷ |
| S83.2: Tear of meniscus, current injury |
| S83.21A: Bucket-handle tear of medial meniscus, current injury, initial encounter |
| S83.205A: Other tear of unspecified meniscus, current injury, unspecified knee, initial encounter |
| S83.22A: Peripheral tear of medial meniscus, current injury, initial encounter |
| S83.26A: Peripheral tear of lateral meniscus, current injury, initial encounter |
| S25.669: Stiffness of unspecified knee, not elsewhere classified |
| Knee instability,¹⁵,¹⁵-¹⁷ |
| M23.60: Other spontaneous disruption of unspecified ligament of knee |
| M23.61: Other spontaneous disruption of anterior cruciate ligament of knee |
| M23.62: Other spontaneous disruption of posterior cruciate ligament of knee |
| Internal derangements other than medial meniscal tear,¹⁵,¹⁶ |
| M93.2: Osteochondritis dissecans |
| M23.8: Other internal derangements of knee |
| M23.25: Derangement of posterior horn of lateral meniscus due to old tear or injury |
| M23.26: Derangement of other lateral meniscus due to old tear or injury |
| M23.35: Other meniscus derangements, posterior horn of lateral meniscus |

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⁴Osteoarthritis as defined by the American College of Rheumatology. ICD-10, International Classification of Diseases–10th Revision; RCT, randomized controlled trial.

⁶Does not include nontraumatic osteoarthritis in studies with a primary clinical diagnosis other than osteoarthritis. Diagnoses of conditions external to the knee joint not included.

for 4 of the 8 MMT studies included the failure of clinician-assessed nonspecific nonoperative management between 1 and 3 months. No MMT study examined the outcomes of patients who had undergone a structured rehabilitation program and continued to have severe self-described symptoms after randomization to an operative versus nonoperative intervention.

**Outcomes of Patients Who Self-Reported Mechanical Symptoms.** Self-reported mechanical symptoms were common in all studies. One study,¹⁴ a secondary analysis of a previously published RCT, found no difference in patients with atraumatic self-described mechanical symptoms who underwent medial meniscectomy compared to a sham procedure. Kirkley et al⁶ found no improvement in a subgroup of patients with OA and self-described mechanical symptoms compared to rehabilitation.

Progression of OA After Partial Meniscectomy. The study by Herrlin et al⁵ found no difference in OA progression 5 years after partial medial meniscectomy compared to physical therapy.
Conclusion

- All of the OA studies had a high risk of bias in at least 1 domain.
- One OA study\(^1\) had a low risk of bias from blinding. In this study, patients who were assessed clinically to have moderate to severe knee OA, in the absence of loose bodies or locking, showed no advantage of arthroscopic debridement over lavage or sham surgery. 
- In a study with a high risk of bias,\(^6\) patients with isolated medial femoral condyle degenerative lesions benefited from an arthroscopic intervention compared to rehabilitation.
- In a study with a high risk of bias,\(^8\) arthroscopic patellofemoral chondroplasty did not benefit patients compared to nonoperative management.
- In atraumatic MMTs,\(^15\) in the absence of surgeon-assessed locking or locked knees or a repairable meniscal tear, a study with a low risk of bias showed no advantage of arthroscopic partial meniscectomy over sham surgery.
- In a study with a high risk of bias in 1 domain,\(^14\) in patients with an atraumatic onset of self-described mechanical symptoms, in the presence of an MMT, other than surgeon-assessed recent locking, a locked knee, or symptomatic loose bodies, there was no advantage to arthroscopic partial meniscectomy over sham surgery.
- The role of arthroscopic surgery in lateral meniscal tears remains uncertain, as it has not been subjected to an RCT.
- The role of subchondral drilling or microfracture undertaken in combination with osteotomy remains uncertain, as no RCTs exist comparing it to osteotomy alone.
- Preservation of the medial or lateral meniscus by repair of the body or root, with or without degeneration of the joint, has not been subjected to an RCT.
- No MMT study examined the outcomes of patients who failed a structured rehabilitation program by randomization to an operative versus nonoperative intervention.

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