Arthroscopic surgery for degenerative knee arthritis and meniscal tears: a clinical practice guideline

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Arthroscopic surgery for degenerative knee disease including arthritis and meniscal tears: a clinical practice guideline

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(MAIN INFOGRAPHIC)

We recommend against arthroscopic knee surgery in patients with degenerative knee disease.

Context

Approximately 25% of middle aged and elderly people experience knee pain from degenerative knee disease.[1 2]

Management options include watchful waiting, weight loss, physical therapy, exercise, oral or topical pain medications, corticosteroid injections, arthroscopic knee surgery, and knee replacement or osteotomy. The preferred combination or sequence of these options is not clear and probably varies between patients. Total knee replacement is the only definitive therapy, but it is reserved for patients with severe disease who fail non-operative management.[3 4] Some believe that arthroscopic lavage and/or debridement to wash out intra-articular debris with or without arthroscopic partial meniscectomy to remove damaged meniscus may improve pain and function.

Box. What is degenerative knee disease?

Degenerative knee disease is an inclusive term, which many consider synonymous with osteoarthritis. We explicitly include patients with degenerative knee disease and:

- no or any degree of radiographic osteoarthritis;
- meniscal tears;
- pain, locking, clicking or other mechanical symptoms;
- acute, subacute, or insidious onset of symptoms

Most people with degenerative arthritis have at least one of these characteristics.[5]

Current guidelines generally discourage arthroscopy for patients with clear radiographic evidence of osteoarthritis alone but several support or do not make clear statements regarding arthroscopic surgery in several common groups of patients (Table).

Table. Statements from current guidelines on arthroscopy for degenerative knee disease

	Lavage/ debridement for OA	No evidence of radiographic OA	Partial meniscectomy	Mechanical symptoms	Meniscal tear
AAOS[6]	Against	Supportive	Supportive	Supportive	Supportive
NICE[7]	For*	No comment	No comment	For	No comment
ESSKSA[8]	Against	For	For**	Supportive	For**
BOA[9]***	Against	For	No comment	For	For
AOA[10]***	Against	No comment	Against	No comment	For

OA, osteoarthritis; AAOS, American Academy of Orthopedic Surgeons; NICE, National Institute of health and Care Excellence; ESSKSA, European Society for Sports Traumatology, Knee Surgery and Arthroscopy; AOA, Australian Orthopaedic Association

For/Against: explicit statement that arthroscopy should/should not be performed in some patients; supportive: seemingly supportive of arthroscopy in some contexts

*Recommendation for debridement in some patients with OA. Recommendation against lavage alone if there is osteoarthritis.

**Recommendation restricted to patients without radiographic evidence of OA

***Official statement, not guidelines

Arthroscopic knee surgery for degenerative knee disease is the most frequent orthopaedic procedure [11] and on a global scale, continues to be performed more than 2 million times for this indication per year (Figure 1).[12-15] Reasons arthroscopic knee surgery continues to be so common in the face of recommendations against its use for osteoarthritis may include a high prevalence of features that have been advocated to predict a positive response to arthroscopic surgery (though with little supportive evidence) and financial incentives. Arthroscopic procedures for degenerative knee disease cost more than 3 billion dollars per year in the United States alone.[16]

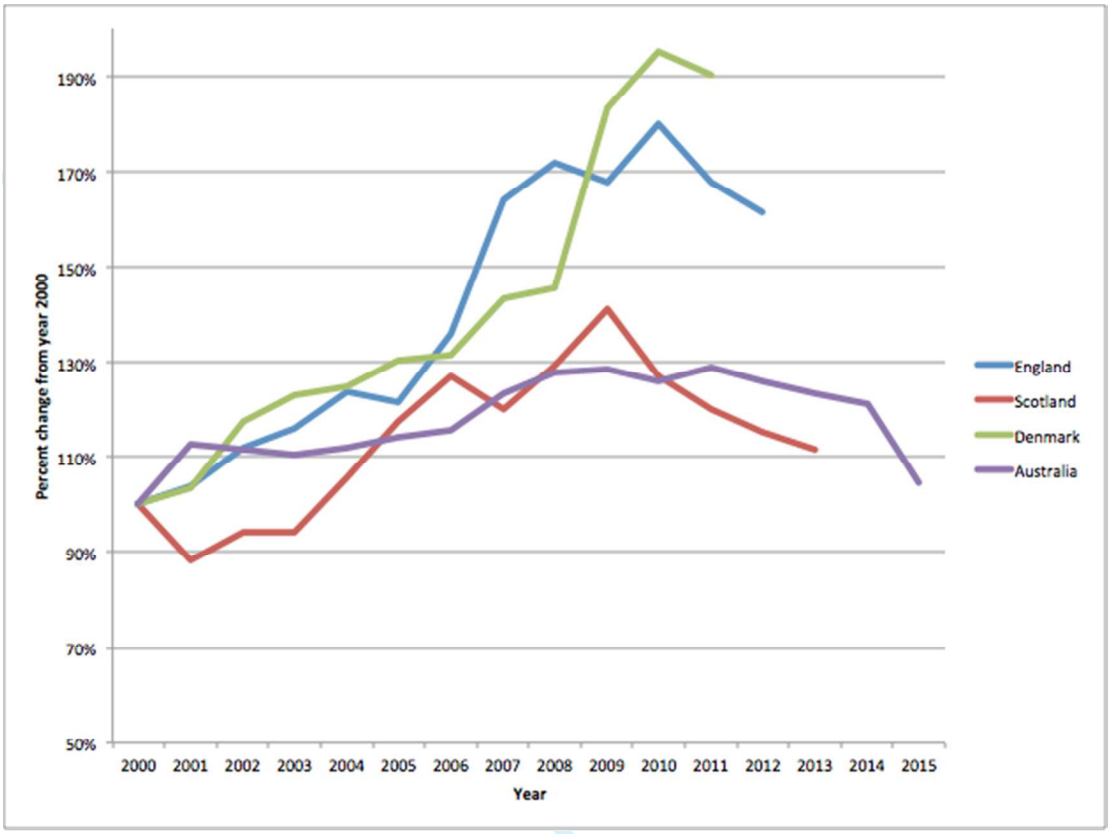

Figure 1. Population adjusted trends in knee frequency of knee arthroscopy; percent

How the recommendation was created

A randomised controlled trial published in the BMJ June 2016 found that in patients with a degenerative medial meniscus tear, knee arthroscopy was no better than exercise therapy.[17] The study by Kise and colleagues adds to the body of evidence suggesting that the benefits of arthroscopy may not outweigh the burden and risks.[18 19] The RapidRecs executive felt that the Kise study, when considered in context of the full body of evidence, might change practice.[20]

Our international panel including orthopaedic surgeons, a rheumatologist, physiotherapists, a general practitioner, general internists, an epidemiologist, methodologists, and people with lived experience of degenerative knee disease including those who had had and not had arthroscopy met to discuss the evidence. No person had financial conflicts of interest; intellectual and professional conflicts were minimised and managed (Web Appendix 1).

The panel followed the BMJ-Rapid Recommendations procedures for creating a trustworthy recommendation[20 21] and used the GRADE approach to critically appraise the evidence and create recommendations (Web Appendix 2).[22] The panel considered the balance of benefits, harms and burdens of the procedure, the quality of evidence for each outcome, typical and expected variation in patient values and

preferences, and acceptability. Recommendations can be strong or weak, for or against a course of action.

The Evidence

The randomised controlled trial comparing knee arthroscopy to exercise therapy published in the BMJ June 2016[17] triggered this recommendation process. The panel requested two linked systematic reviews to inform the recommendation.[23 24]

The systematic review on the net benefit of knee arthroscopy compared to non-operative care pools data from 13 randomised trials for benefit outcomes (1668 patients) and 12 observational studies for complications (>1.8 million patients).[24] The Infographics below the recommendation provide an overview (GRADE Evidence Profile) of the benefits and harms of arthroscopy. Estimates of baseline risk for effects comes from the control arms of the trials; for complications, comparator risk was assumed to be nil. Infographic 2 gives an overview of the patients included, the study funding, and patient involvement.

The panel is confident that all relevant patient groups were represented in the randomised controlled trials and that the recommendation applies to all or almost all patients with degenerative knee disease - notably those with meniscal tears, no or minimal radiographic evidence of osteoarthritis, and those with sudden symptom onset. Further, the evidence applies to patients with any severity of mechanical symptoms, with the only possible exception being those who are objectively unable to fully extend their knee.

Panel members, including those with lived experience, identified pain, function and quality of life as the most important outcomes for patients with degenerative knee disease considering surgery.

The included studies reported these patient-important outcomes. However, it is difficult to know whether changes recorded on an instrument measuring subjective symptoms are important to those with symptoms, for example how important is a change of 3 points on any individual pain scale?

Therefore, a second team performed a linked systematic review addressing what level of change is important to patients: a test characteristic called the minimally important difference.[25] The study identified credible minimally important differences for each key outcome; these estimates informed discussions on the patient values and preferences, and were ultimately key to determining the strength of the recommendation.[23]

The panel making the recommendation is confident that arthroscopic knee surgery does not, on average, result in an improvement in the long-term pain or function. Arthroscopy does result in a small (<15%) incremental chance of experiencing a small or very small improvement in pain or function at 3 months, which was no longer apparent at one year. In addition to the burden of undergoing knee arthroscopy (see Practical issues below) there are rare but important harms in

those undergoing knee arthroscopy compared to those who received usual care, although the precision in these estimates is uncertain (GRADE low quality of evidence).

It is unlikely that new information will change interpretation for the key outcomes on pain, knee function and quality of life (GRADE high to moderate quality of evidence).

Infographic 2: Randomised trial characterisitcs.

	Mean	Range of means	
Number of patients enrolled	128	17-351	
Age (mean years at baseline)	54.8	48.9-62.8	
Sex (% women)	49.2	5-81.7	
Body mass index	Mean BMI 25.7 to 32.3		
Duration of pain	Mean pain duration 8 to 52 months		
Previous treatment	4 of 13 studies reported previous treatment: all exclusively included patients who failed some form of conservative management		
Evidence of OA (% Kellgren Lawrence 2-3)	>50% had radiographic OA in 5 studies <50% had radiographic OA in 6 studies		
Exclusion criteria	Most studies excluded patients with previous arthroscopic surgery or knee surgery		
Meniscal tears:	>60% had meniscal tears Most patients received partial meniscectomy in 12 of 13 trials		
Funding	12 of 13 free from industry funding		
Patient involvement	No trials involved patients in design or conduct		

Practical issues

It takes between 2 and 6 weeks to recover from arthroscopy during which time patients may experience pain, swelling, and limited function.[26 27] Most patients

cannot weight bear on that leg (ie. may need crutches) in the first week after surgery and driving/physical activity is limited during the recovery period.[26]

Degenerative knee disease is a chronic condition where symptoms fluctuate. On average, pain tends to improve over time after seeing a physician for pain;[24 28] and delaying knee replacement is encouraged when possible.[3]

INFOGRAPHIC 3: PRACTICAL ISSUES

	Non surgical management includes different options*	Arthroscopic knee surgery
PROCEDURE	• may be performed in hospital or the community • no general anaesthesia • injections may use local anesthesia	• performed by an orthopaedic surgeon in an operating theatre • General or regional anaesthesia • Procedure usually takes < 1 hour. • Small joint incisions through which a camera and surgical tools are inserted • option to repair or remove torn cartilage
TESTS & VISITS	physiotherapy and intra-articular injections require appointments	Individualized follow-up and wound care is required.
RECOVERY & ADAPTATION		• Recovery typically between 2 to 6 weeks • Unable to weight bear for 2-7 days • Physiotherapy and wound care facilitate recovery
EXERCISE & ACTIVITIES	restriction of activities which exacerbate symptoms may be advised with all alternative treatments	avoid strenuous activity during recovery and reintroduce as comfort permits from 2 to 3 weeks and thereafter those causing symptoms
WORK & EDUCATION		Time until return to work depends on speed of recovery and demands of job (within 1 or 2 weeks for sedentary work; at least 2 weeks if job is more physical).

TRAVEL & DRIVING		Driving is limited for about 1-3 weeks after procedure.

*Details of each option are not covered in this summary but may include over the counter pain medication, exercise, physiotherapy, knee injections with steroids or hyaluronic acid, orthotics, watchful waiting. Where relevant specific details included in the table - where not applicable the option is not mentioned.

Values and Preferences

The strong recommendation against arthroscopy reflects a low value on a modest probability (< 15%) of small but important improvement in pain and function that does not persist at one year, and a higher value on avoiding the burden, post-operative limitations, and rare serious adverse effects associated with knee arthroscopy. The panel, including the patient participants, felt that almost all patients would share these values. The recommendation is not applicable to patients who do not share these values (i.e. those who place a high value on a small, uncertain, and transient reduction in pain and function, and a low value on avoiding the burden and post-operative limitation associated with arthroscopy).

Costs and resources

The panel took a patient-perspective when formulating the recommendation and did not consider costs at a societal level, but implementing our recommendation will almost certainly result in considerable cost savings for health funders. A rigorous economic analysis found that knee arthroscopy for degenerative knee disease is not close to cost-effective by traditional standards, even in the most extreme scenarios that assume a benefit with arthroscopy.[29] From a patient perspective, the panel made a strong recommendation against arthroscopy, which applies to almost all patients with degenerative knee disease, implying that non-use of knee arthroscopy can be used as a performance measure or tied to health funding.[30]

Future research

Future guidelines and decision makers would benefit from studies that answer the following questions:

- Randomised trial(s): does arthroscopic knee surgery benefit patients who are unable to objectively fully extend their knee or who have persistent, severe, and frequent mechanical symptoms?
- Implementation studies: what are the most effective ways to reduce the overuse of arthroscopic surgery for degenerative knee disease?

Box. How patients were involved in the creation of this article:

Three people with lived experience of osteoarthritis, one of whom had arthroscopic knee surgery were full panel members. These panel members identified important outcomes and led the discussion on values and preferences. Pain was weighed as higher importance for most patients: for example, the patient panel members felt that a possible small benefit to function without a reduction in

pain was unimportant to almost all patients. Those with lived experience identified key practical issues including concerns with cost and accessibility for arthroscopy and physiotherapy. The members participated in the teleconferences and email discussions and met all authorship criteria.

Box. What you need to know:

- Knee arthroscopy is the most common orthopaedic procedure
- A new trial and systematic reviews provide data to make strong recommendations against the use of arthroscopy on nearly all groups of patients with degenerative knee disease
- Arthroscopy for degenerative knee disease probably has no long term benefit
- Further research is unlikely to alter this recommendation
- Healthcare administrators and funders may use levels of arthroscopy performed in patients with degenerative knee disease as an indicator of quality care

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Static screenshot of the fully-expanded graphic

Contextual information, which will only be provided when viewer interacts with these elements (by hovering the mouse or touching the screen)

This section will be hidden initially

Population

People with degenerative knee disease

Including people with:

- Radiographic evidence of osteoarthritis
- A range of osteoarthritis severities
- Mechanical symptoms
- Acute onset knee pain
- Meniscal tears

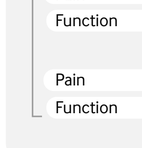
X-ray or MRI changes of arthritis

Tear in knee cartilage

Pain started suddenly or slowly

Locking, clicking, catching

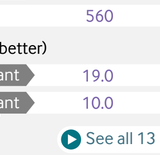
Choice of intervention



Arthroscopic surgery

Including arthroscopic surgery with or without partial meniscectomy or debridement

or



Conservative management

Any conservative management strategy (exercise therapy, injections, drugs, sham surgery)

Recommendations

Population	Favours arthroscopic surgery	Favours conservative management	
All	Strong / Weak	Weak / Strong	Why?

Benefits outweigh harms for the majority, but not for everyone. The majority of patients would likely want this option

Benefits outweigh harms for almost everyone. All or nearly all informed patients would likely want this option

Comparison of benefits and harms

	Favours arthroscopic surgery	Favours conservative management	Summary	Evidence quality
Short term benefits (<3 months)	Number with improved symptoms, per 1000 people			
Pain	614 **124 more**	490		★★★★ High
Function	681 **131 more**	550		★★★☆ Moderate
	Mean score (0–100, high better)			
Pain	20.0 **5.38 higher**	15.0		★★★★ High
Function	14.0 **4.98 higher**	9.0		★★★☆ Moderate
Short term harms (<3 months)	Events per 1000 people			
Venous thromboembolism	5	**5 fewer** 0		★★☆☆ Low
Infection	2	**2 fewer** 0		★★☆☆ Low
Long term benefits (1–2 years)	Number with improved symptoms, per 1000 people			
Pain	539 Not clinically important	540		★★★☆ Moderate
Function	681 **121 more**	560		★★☆☆ Low
	Mean score (0–100, high better)			
Pain	22.0 Not clinically important	19.0		★★★★ High
Function	13.0 Not clinically important	10.0		★★★☆ Moderate

See all 13 outcomes MAGIC app

Based on high-quality trials with low risk of bias

Due to serious risk of bias

Based on high-quality trials with low risk of bias

Due to serious risk of bias, borderline inconsistency, and borderline imprecision

Due to serious risk of bias and serious inconsistency

Due to serious risk of bias and serious inconsistency

Due to inconsistency that results in imprecision

Due to serious risk of bias and imprecision

Based on high-quality trials with low risk of bias

Due to serious risk of bias and bordeline imprecision

The panel agreed that this outcome was of minimal importance to patients

Key practical issues

Arthroscopic surgery	Conservative management
Performed by a surgeon, in an operating theatre	May be performed in hospital or the community
Recovery typically between 2 to 6 weeks	No recovery time
At least 1–2 weeks off work, depending on speed of recovery and physical demands of job	Time off work may be required for appointments, such as physiotherapy and injections

Preferences and values

The panel believes that almost everyone would prefer to avoid the pain and inconvenience of the recovery period after arthroscopy, since it offers only a small chance of a small benefit.

Resourcing

Arthroscopy is not cost-effective from a societal perspective.

Other considerations

Those shown as having "improved symptoms" are those that meet the "Minimal important difference" in pain or function scores. However, these improvements are still very small.

Knee arthroscopy increases the number of patients with a reduction in short-term pain by approximately 12 in 100

Knee arthroscopy probably increases the number of patients with an improvement in short-term function by approximately 13%

On average, knee arthroscopy results in very small reduction in pain

Knee arthroscopy may increase function change slightly more than control

Arthroscopy may have a small risk of venous thromboembolism

Arthroscopy may have a small risk of infection

Knee arthroscopy probably does not change the number of patients with a reduction in long-term pain

Knee arthroscopy may increase the number of patients with an improvement in function

On average, knee arthroscopy results in no difference, or a very small reduction, in pain

On average, knee arthroscopy probably results in no improvement, or a very small improvement, in function

Appendix 1: Conflicts of Interest

Pre-screening

All panel members were pre-screened for conflicts of interest prior to the guideline process that resulted in the BMJ Rapid Recommendations. The RapidRecs Executive team from the non-profit organisation MAGIC (www.magicproject.org) performed the prescreening with support from BMJ editors. No financial conflicts of interest were allowed (specifically, no financial ties to the arthroscopy industry or any other intervention for degenerative knee disease) and intellectual and professional conflicts of interest were managed appropriately (see appendix 2: Methods for BMJ Rapid Recommendations). We could not find an appropriate orthopaedic content expert to chair the panel, despite seriously considering approximately ten otherwise highly qualified individuals, so we chose to use a

Financial disclosures

No guideline panel members have any financial conflicts of interest to disclose in any way related to this clinical question. Some panel members have received funding from industry: Dr. Poolman is the primary investigator in hip fracture trials funded by LIMA and LINK, who do not have any products related to degenerative knee disease. Dr. Buchbinder has sat on panel discussions and given talks at symposiums funded by Roche Australia and BMS Rheumatology; neither company has any products used in degenerative knee disease.

Professional disclosures:

Drs. Harris, Poolman, and Knutsen perform arthroscopic surgery. Drs. Van De Velde (physiotherapist), Buchbinder (rheumatologist), Hailey (physiotherapist), and Olsen (physiotherapist) manage patients with degenerative knee disease non-operatively.

Intellectual disclosures:

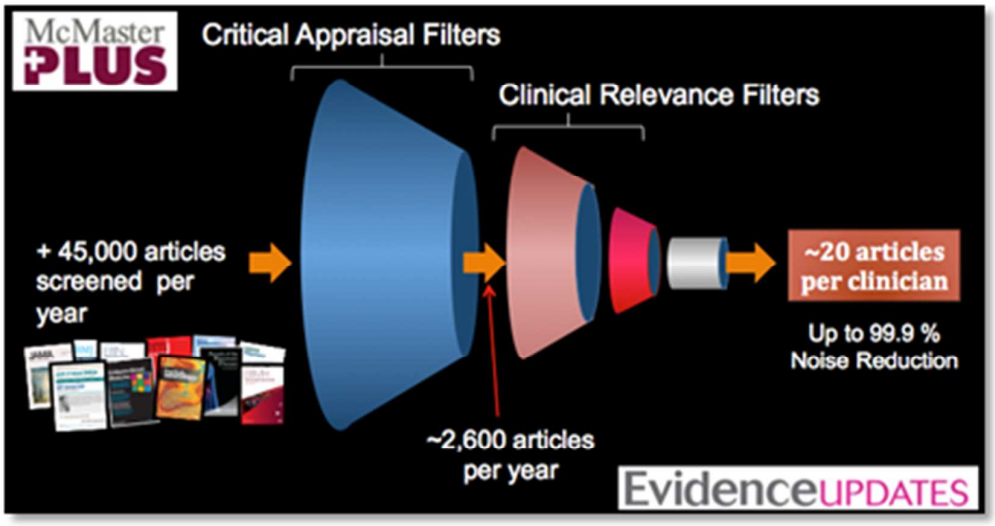
Dr. Harris is a board member of the Australian Orthopaedic Association, which has taken a position on the matter; he has made some statements generally discouraging widespread use of arthroscopy. Dr. Poolman is the primary investigator of an ongoing randomised trial examining arthroscopy versus physical therapy for degenerative meniscal tears. Dr. Buchbinder is a board member on the Australian Rheumatology Association, is the chair of the Knee Osteoarthritis Clinical Care Standard Topic Working Group for the Australian Commission on Quality and Safety in Health Care, and the Joint Coordinating Editor, Cochrane Musculoskeletal group, and has made statements generally discouraging routine use of arthroscopy for osteoarthritis. Dr. Englund is a board member for the Osteoarthritis Research Society International (OARSI); he has previously made statements discouraging arthroscopy for osteoarthritis. Dr. Englund and Ms. Wilson are members of the European Society for Sports Traumatology, Knee Surgery and Arthroscopy (ESSKA) guideline panel on arthroscopy for knee meniscus disease, which made statements generally more supportive of arthroscopy than the current guideline. Dr. Siemieniuk, Agoritsas, Lytvyn, and Kristiansen are members of the GRADE Working Group.

About *BMJ* Rapid Recommendations

Translating research to clinical practice is challenging. Trusworthy clincal practice recommendations are one useful knowledge translation strategy. Organisations creating systematic reviews and guidelines often struggle to deliver timely and trustworthy recommendations in response to potentially practice-changing evidence. *BMJ* Rapid Recommendations aims to create trustworthy clinical practice recommendations based on the highest quality evidence in record time. The project is supported by an international network of systematic review and guideline methodologists, people with lived experience of the diseases, clinical specialists, and front-line clinicians. This overview is one of a package that includes recommendations and one or more systematic reviews published by the *BMJ* group and in MAGICapp (http://www.magicapp.org). The goal is to translate evidence into recommendations for clinical practice in a timely and transparent way, minimizing bias and centered around the experience of patients. *BMJ* Rapid Recommendations will consider both new and old evidence that might alter established clinical practice.

Process overview

1. We monitor the literature for practice-changing evidence through
   a. Formal monitoring through McMaster Premium LiteratUre Service (PLUS)



   b. Informal monitoring the literature by *BMJ* Rapid Recommendations expert groups, including clinician specialists and patients

2. The *RapidRecs* executive team - from the non for profit MAGIC organisation (www.magicproject.org) - and *The BMJ* choose among the identified potentially-practice changing evidence which clinical questions to pursue, based on relevance to a wide audience, widespread interest, and likelihood to change practice.

3. We incorporate the evidence into the existing body of evidence and broader context of clinical practice via:

a. a rapid and high-quality systematic review and meta-analysis on the benefits and harms with a focus on the outcomes that matter to patients
b. parallel rapid recommendations that meet the standards for trustworthy guidelines[1] by an international panel of people with relevant lived experience, front-line clinicians, clinical content experts, and methodologists.
c. The systematic review and the recommendation panel will apply standards for trustworthy guidelines.[1,2] They will use the GRADE approach, which has developed a transparent process to rate the quality (or certainty) of evidence and grade the strength of recommendations.[3,4]
d. Further research may be conducted including:
    i. A systematic review of observational studies to identify baseline risk estimates that most closely represent the population at the heart of the clinical question, a key component when calculating the estimates of absolute effects of the intervention
    ii. A systematic review on the preferences and values of patients on the topic.

4. Disseminate the rapid recommendations through
    a. publication of the research in *BMJ* journals
    b. short summary of recommendations for clinicians published in *The BMJ*
    c. press release and/or marketing to media outlets and relevant parties such as patient groups
    d. Links to BMJ Group's *Best Practice* point of care resource
    e. MAGICapp which provides recommendations and all underlying content in digitally structured multilayered formats for clinicians and others who wish to re-examine or consider national or local adaptation of the recommendations.

Who is involved?

Researchers, systematic review and guideline authors, clinicians, and patients often work in silos. Academic journals may publish work from any one or combinations of these groups of people and findings may also be published in the media. But it is rare that these groups work together to produce a comprehensive package. *BMJ-RapidRecs* circumvents organisational barriers in order to provide clinicians with guidance for potentially practice-changing evidence.

Our collaboration involves

a. The *RapidRecs* group with a designated Executive team responsible for recruiting and coordinating the network of researchers who perform the systematic reviews and the recommendation panels.. The *RapidRecs* group is part of MAGIC (www.magicproject.org), a non for profit organization that provides MAGICapp (www.magicapp.org) an authoring and publication platform for evidence summaries, guidelines and decision aids, which are disseminated online for all devices.[5]
b. *The BMJ* helps identifiying practice-changing evidence on key clinical questions, coordinates the editorial process and publishes the package of content linking to the MAGICapp that is presented in a user friendly way.

METHODS FOR THE RAPID RECOMMENDATIONS

The formation of these recommendations adheres to standards for trustworthy guidelines with an emphasis on patient involvement, strict management of conflicts of interests, as well as transparent and systematic processes for assessing the quality of evidence and for moving from evidence to recommendations.[1,2,6]

Guidance on how the panel is picked and how they contribute

Panel members are sought and screened through an informal process.

The following panel members are important

- At least one but no more than three authors of the individual systematic reviews
- At least one patient representative with lived experience. This person receives patient-oriented documents to explain the process and is allocated a linked panel member to empower their contribution.
- A full spectrum of practicing clinicians involved in the management of the clinical problem and patients it affects, including front-line clinicians with generalist experience and those with deep content clinical and research expertise in the particular topic.
- Methodological experts in health research methodology and guideline development

Any potential conflicts of interest are managed with extreme prudence :

- No panel member may have a financial interest that is judged by the panel chair, the *Rapidrecs* executive team or The BMJ editors as relevant to the topic
- No more than two panel members with an intellectual interest on the topic (typically having published statements favouring one of the interventions).

Illustrative example: For the BMJ Rapid Recommendations on TAVI versus SAVR for patients with severe aortic stenosis, the panel recruitment of content experts and community panel members was challenging. Content experts in this area are cardiologists and cardiac surgeons, many of whom have financial conflicts of interests through interactions with the device providers through advisory boards and participation in industry-funded trials. The Chair of the panel was able, with considerable effort and ingenuity, to recruit 3 excellent and unconflicted content experts. Another challenge was to find patient representatives who were able to contribute, as severe aortic stenosis typically affects older and frail people. Two community members were ultimately recruited, and they both contributed effectively throughout the process.

How the panel meets and works

The international panel communicates via teleconferences and e-mail exchange of written documents throughout the process. Minutes from teleconferences are audiorecorded, transcribed, and stored for later documentation (available for peer-reviewers on request).

Teleconferences typically occur at three timepoints, with circulated documents by e-mail in advance:

1. At the initiation of the process to provide feedback on the systematic review protocol (for example, on selection of patient-important outcomes and appropriate prespecified analysis of results) before it is performed.
2. At the evidence summary stage with discussion, feedback and agreement on draft evidence (GRADE evidence profile) prepared by the Chair and the methods editor based on the systematic review.
3. At the recommendation formulation phase with discussion, feedback and agreement on draft recommendations and other content underlying the recommendation (e.g. GRADE SoF-table, key information, rationale, practical advice)

Following the last teleconference the final version of the recommendations are circulated by e-mail specifically requesting feedback from all panel members to document agreement before submission to *The BMJ*. Additional teleconferences are arranged as needed.

Illustrative example: For the development of the TAVI versus SAVR recommendations, five teleconferences were arranged. In two separate teleconferences for the creation of the evidence summary, content experts provided crucial input to evidence assessment (e.g. type of TAVI devices used in trials). For the recommendation formulation phase the panel needed two teleconferences to discuss all elements in detail, followed by more than 100 e-mails with specific issues to be sorted out. Multiple teleconferences to discuss the same topic were held to allow the scheduling flexibility required so that all could participate. All panel members agreed on the final recommendations.

How we move from research findings to recommendations

What information is considered?

The panel considers best current evidence from available research. Beyond systematic reviews - performed in the context of the *BMJ* Rapid Recommendations - the panel may also include a number of other research papers to further inform the recommendations.

How is a trustworthy guideline made?

The Institute of Medicine (IOM)'s guidance on out how trustworthy guidelines should be developed and articulated key standards as outlined in the table below.[1] The standards are similar to those developed by the Guideline International Network (G-I-N).[2] These standards have been widely adopted by the international guideline community. Peer reviewers of the recommendation article are asked whether they found the guideline trustworthy (in accordance with IOM standards). The table below lays out how we hope to meet the standards for our rapid recommendations:

1. Establishing transparency

"The processes by which a CPG is developed and funded should be detailed explicitly and publicly accessible"*

- This method is available and published as a supplementary file as well as in MAGICapp where all recommendations and underlying content is available.
- We ask the peer-reviewers to judge whether the guidance is trustworthy and will respond to concerns raised.

2. Managing conflicts of interest

"Prior to selection of the guideline development group, individuals being considered for membership should declare all interests and activities potentially resulting in COI with development group activity....",

- Interests of each panel member are declared prior to involvement and published with the rapid recommendations
- No one with any potential financial interests in the past three years, or forthcoming 12 months will participate - as judged by the panel chair and *The BMJ*
- No more than two panel members have declared an intellectual conflict of interest. Such conflicts include having taken a position on the issue for example by a written an editorial, commentary, or conflicts related to performing a primary research study or written a prior systematic review on the topic.
- The Chair must have methods expertise, a clinical background and no financial or intellectual interests.
- Funders and pharmaceutical companies have no role in these recommendations.

3. Guideline Development Group Composition

"The guideline development group should be multidisciplinary and balanced, comprising a variety of methodological experts and clinicians, and populations expected to be affected by the CPG"

- *The RapidRecs* group will aim to include representation from most or every major geographic region in the world, with specific efforts made to achieve gender-balance.
- We will facilitate patient and public involvement by including patient experience, via patient-representatives and systematic reviews addressing values and preferences to guide outcome choices and relative weights of each outcome, where available
- Patient-representatives will be given priority during panel meetings and will have an explicit role in vetting the panel's judgements of values and preferences.

4. Clinical Practice Guideline–Systematic Review Intersection

"CPG developers should use systematic reviews that meet standards set by the IOM. Guideline development group and systematic review team should interact regarding the

scope, approach, and output of both processes".

- Each rapid recommendation will be based on one or more high-quality SRs either developed and published in parallel with our *BMJ* Rapid Recommendations or produced by other authors and available at the time of making the recommendaiton.
- The recommendation panel and SR teams will interact, with up to three members participating in both teams to facilitate communication and continuity in the process

5. Establishing Evidence Foundations for and Rating Strength of Recommendations

"For each recommendation: explain underlying reasoning, including a clear description of potential benefits and harms, a summary of relevant available evidence and description of the quality., explain the part played by values, opinion, theory, and clinical experience in deriving the recommendation, "provide rating of strength of recommendations"

- The GRADE approach will provide the framework for establishing evidence foundations and rating strength of recommendations.[6] For each recommendation systematic and transparent assessments are made across the following key factors:
  - Absolute benefit and harms for all patient-important outcomes through structured evidence summaries (e.g. GRADE Summary of Findings tables)[4]
  - Quality of the evidence[7]
  - Values and preferences of patients
  - Resources and other considerations (e.g. feasibility, applicability, equity)
- Each outcome will - if data are available through systematic reviews - include an effect estimate and confidence interval, with a measure of certainty in the evidence, as presented in Summary of Findings tables. If such data are not available narrative summaries will be provided.
- A summary of the underlying reasoning and all additional information (e.g. key factors, practical advice, references) will be available online in an interactive format at www.magicapp.org. This summary will include descriptions of how theory (e.g. patophysiology) and clinical experience played into the evidence assessment and recommendation development.
- Recommendations will be rated either weak or strong, as defined by GRADE.[8]
- If the panel members disagree regarding evidence assessment or strength of recommendations, we will follow a structured consensus process customized to the GRADE system and report any final differences in opinion, with their rationale, in the online supplement and online at www.magicapp.org.

6. Articulation of recommendations

"Recommendations should be articulated in a standardized form detailing precisely what

the recommended action is, and under what circumstances it should be performed, and so that compliance with the recommendation(s) can be evaluated"
• Each recommendation will appear at the top of the guideline infographic, published in *The BMJ*, and will be available in standardised formats in MAGICapp, articulated to be actionable based on best current evidence on presentation formats of guidelines.[9] • There will be a statement included in each summary article in *The BMJ* and in the MAGICapp that these are recommendations to provide clinicians with guidance. They do not form a mandate of action and should be contextualised in the healthcare system a clinician's works in, and or with an individual patient.
7. External review **"External reviewers should comprise a full spectrum of relevant stakeholders...., authorship should be kept confidential....., all reviewer comments should be considered....a rationale for modifying or not should be recorded in writing.... a draft of the recommendation should be made available to general public for comment.."**
• At least two external peer-reviewers and one patient reviewer will review the article for *The BMJ* and provide open peer review. Each will have access to all the information in the package. They will be asked for general feedback as well as to make an overall judgement on whether they view the guidelines as trustworthy • A *BMJ* series adviser with methodological and/or statistical expertise will review the *BMJ* Rapid Recommendations publication and the systematic reviews. • The *Rapidrecs* panel will be asked to read and respond to the peer review comments and make amendments where they judge reasonable • *The BMJ* and *RapidRecs* executive team may, on a case-by-case basis, choose to invite key organizations, agencies, or patient/public representatives to provide and submit public peer-review. • There will be post-publication public review process through which people can provide comments and feedback through MAGICapp (or through *The BMJ*). The Chair will, on behalf of panel authors, aim to respond to each publicly-available peer-review within 30 days, for a period of six months after publication.
8. Updating **"The date for publication, systematic review and proposed date for future review should be documented, the literature should be monitored regularly and the recommendation should be updated when warranted by new evidence"**

- The *Rapidrecs* panel will, through monitoring of new research evidence for published *BMJ* Rapid Recommendations, aim to provide updates of the recommendations in situations in which the evidence suggests a change in practice. These updates will be initially performed in MAGICapp and submitted to *The BMJ* for consideration of publication of a new Rapid Recommendation.

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BMJ RapidRecs: Arthroscopic surgery for degenerative knee disease

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Disclaimer

Sections

Summary of recommendations

1 - Arthroscopic surgery for degenerative knee disease

Strong Recommendation AGAINST

We recommend against arthroscopic knee surgery in patients with degenerative knee disease.

1 - Arthroscopic surgery for degenerative knee disease

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Methods editor: Annette Kristiansen, MD PhD

Introduction

Degenerative knee disease, which many understand as knee osteoarthritis, is one of the most prevalent chronic diseases in middle aged and elderly persons. The limited evidence on the direct correlation between radiological findings and patient reported symptoms has led to differing treatment practices. Both operative and non-operative treatment options are available. Currently, arthroscopic surgery is a widespread practice, despite a fairly recent systematic review by Thorlund et al. *[1]* questioning the net long-term effect and value of such a practice. We - the RapidRecs group - convened to address this apparent care gap.

We have systematically reviewed the effects of arthroscopic irrigation, debridement and/or partial meniscectomy versus non-operative management or placebo in patients with symptomatic degenerative knee disease. We have evaluated the benefit on patient important outcomes such as pain, function and quality of life and considered the potential harms. The estimates of effect are measured in units of minimal important difference, defined as the smallest difference in score informed patients perceive as important *[2]*.

Below you will find the recommendations with evidence summaries (GRADE SoF-tables), practical information and decision aids for use in the clinical encounter. A detailed account of the background, methods and processes for BMJ RapidRecs can be found in the last section or you can read a brief outline in a recent BMJ Editorial by Siemieniuk et al. *[3]*.

Strong Recommendation AGAINST

We recommend against arthroscopic knee surgery in patients with degenerative knee disease.

Practical Info

Management options:
Non-operative management options include watchful waiting, weight loss, physical therapy, exercise, oral or topical pain medications, and intra-articular corticosteroid or hyaluronic acid injections. *[10]* For patients with severe osteoarthritis, options also include total knee arthroplasty or proximal tibial osteomy. *[11]* However, symptoms tend to fluctuate and vary between patients, thus delaying surgical management is reasonable for many patients. *[11]*

Are there patients with knee pain who might benefit from arthroscopy?
Degenerative knee disease is a broadly encompassing diagnosis in patients who are typically 35 years of age or older and includes osteoarthritis, meniscal tears, knee pain or mechanical symptoms without radiographic or MRI imaging findings of osteoarthritis. Pain can occur acutely - including acute onset during sports or physical activity - or insidiously. The trials included in the evidence summary include adequate patient representation from each of these groups; *[6]* there was no suggestion that any group has a greater benefit from arthroscopy.

The trials generally excluded patients with persisent, frequent, and the severe symptom where they were unable to objectively fully extend their leg (locked knee). It is possible that this very small group would benefit from arthroscpy, but any benefit in this group of patients is highly speculative. Given that there is indirect evidence that harms outweigh benefits - from patients with meniscal tears and severe mechanical symptoms - these patients would ideally be offered arthroscopy in the context of a randomised trial.

Performance measure:
As per GRADE guidance, our strong recommendation against arthroscopy can be used as a performance or quality of care measure and it is reasonable to tie the use of arthroscopy to funding decisions or penalties. The non-use of knee arthroscopy in patients with degenerative knee disease, including patients with meniscal tears who are ≥35 years of age, as a performance measure may be especially relevant given that the frequency of knee arthroscopy is increasing or stable, despite accumulating evidence of no net benefit.

Key Info

Benefits and harms

Patients undergoing arthroscopic knee surgery have a 10-15% chance of achieving a small, short-term improvement in pain and function. *[6]* On average, compared to non-operative management or placebo, improvement is below the *minimally important difference [7]* and there is little or no difference at 1 year. *[6]*

The recovery period following arthroscopy varies, but typically lasts 2-6 weeks and incurres pain and limited function. There is a small risk of pulmonary embolism, deep vein thrombosis and infection, and a very small risk of death and nerve injury. *[6]*

Quality of evidence High

We have high certainty that arthroscopy does not, on average, result in an important long term improvement in pain or quality of life, and moderate certainty that it does not substantially improve knee function. There is low certainty in the magnitude of serious adverse effects, as these data are mostly observational. *[6]* There is high certainty that nearly all patients will have exacerbated pain and function immediately following arthroscopy, although the severity and duration of the recovery period varies. *[8] [9]*

Preference and values No substantial variability expected

Most patients are unlikely to consider a 2-6 week recovery period following arthroscopy worthwile to have a small chance of a minor improvement in short-term pain and function. The multidisciplinary panel, which included persons with lived experience of the disease and experts in shared decision making, unanimously agreed that almost every patient would agree that the harms from arthroscopy clearly outweigh the benefits.

Resources and other considerations

No important issues with the recommended alternative

A recent analysis by Marsh et al. *[4]* evaluated the cost-effectiveness of arthroscopy in addition to non-operative treatment in patients with symptomatic knee osteoarthritis. The incremental net benefit of added arthroscopy was negative, meaning that arthroscopic surgery is not considered cost-effective, neither from a healthcare payer nor from a societal perspective. This conclusion holds even when assuming the largest possible treatment effect, in patients with less severe disease and patients with symptoms of catching and locking.

We have not explicitly evaluated the net benefit of non-surgical treatment of degenerative knee disease versus no treatment. A systematic review by Pinto et al. *[5]* found limited evidence on the cost-effectiveness of non-surgical treatment such as exercise, rehabilitation, acupuncture and lifestyle interventions. They identified three studies demonstrating that exercise programmes might be cost-effective. The out of pocket costs for patients will certainly vary between countries.

Rationale

We issue a strong recommendation against arthroscopy for patients with degenerative knee disease because we believe that the undesirable consequences clearly outweigh the desirable consequences. Further, the quality of the evidence is high or moderate for key outcomes - pain, function, and quality of life. Results are consistent in all trials and there is no trial evidence that any patient group achieves greater benefit, including those without imaging evidence of osteoarthritis, with mechanical symptoms, with acute onset of pain, or with meniscal tears. We expect very little variability in patient values and preferences.

Clinical Question/ PICO

Population: Patients with degenerative knee disease
Intervention: Arthroscopy
Comparator: Conservative management

Outcome Timeframe	**Study results and measurements**	**Absolute effect estimates** Conservative management	Arthroscopy	**Certainty in effect estimates** (Quality of evidence)	**Summary**
Pain (difference in patients who achieve a change higher than the MID) 3 months	Based on data from 1,102 patients in 9 studies. (Randomized controlled) Follow up 3 months	**490** per 1000	**614** per 1000 Difference: **124 more** per 1000 (CI 95% 36 more - 212 more)	**High**	Knee arthroscopy increases the number of patients with a small, but important reduction in short-term pain
Pain (difference in patients who achieve a change higher than the MID) 1-2 years	Relative risk Based on data from 972 patients in 7 studies. (Randomized controlled) Follow up 2 yers	**540** per 1000	**539** per 1000 Difference: **0.7 fewer** per 1000 (CI 95% 134 fewer - 132 more)	**Moderate** Due to serious inconsistency	Knee arthroscopy probably does not change the number of patients with a small, but important reduction in long-term pain

Function (difference in patients who achieve a change higher than the MID) 3 months	Based on data from 835 patients in 6 studies. (Randomized controlled) Follow up 3 months	**550** per 1000 **680** per 1000 Difference: **130 more** per 1000 (CI 95% 41 more - 219 more)	**Moderate** Due to serious risk of bias	Knee arthroscopy probably increases the number of patients with a small, but important improvement in short-term function
Function (difference in patients who achieve a change higher than the MID) 1-2 years	Relative risk Based on data from 718 patients in 5 studies. (Randomized controlled) Follow up 2 years	**560** per 1000 **657** per 1000 Difference: **97 more** per 1000 (CI 95% 3 fewer - 196 more)	**Low** Due to serious risk of bias and imprecision	Knee arthroscopy may increase the number of patients with a small, but important improvement in function
Quality of life (difference in patients who achieve a change higher than the MID) 1-2 years	Relative risk Based on data from 269 patients in 2 studies. (Randomized controlled)	**460** per 1000 **470** per 1000 Difference: **10 more** per 1000 (CI 95% 125 fewer - 146 more)	**Moderate** Due to serious imprecision	Knee arthroscopy probably does not increase or decrease the number of people with an important improvement in quality of life
Knee replacement 1-2 years	Relative risk 1.89 (CI 95% 0.51 - 7) Based on data from 497 patients in 2 studies. (Randomized controlled) Follow up 1 year	**12** per 1000 **23** per 1000 Difference: **11 more** per 1000 (CI 95% 6 fewer - 72 more)	**Moderate** Due to serious imprecision	Knee arthroscopy may increase knee replacement
Mortality 3 months	Based on data from 454,086 patients in 7 studies. (Observational (non-randomized)) Follow up 3 months	**0** per 1000 **0** per 1000 Difference: **0.3 more** per 1000 (CI 95% 0.1 more - 0.6 more)	**Low** Due to serious risk of bias, Due to serious inconsistency	Arthroscopy may have an extremely small risk of mortality
Venous thromboembolism 3 months	Based on data from 1,119,920 patients in 11 studies. (Observational	**0** per 1000 **5** per 1000 Difference: **4.5 more** per 1000	**Low** Due to serious risk of bias, Due to serious inconsistency	Arthroscopy may have a small risk for venous thromboembolism

	(non-randomized)) Follow up 3 months	(CI 95% 2.1 more - 9.9 more)		
Infection 3 months	Based on data from 603,838 patients in 5 studies. (Observational (non-randomized)) Follow up 3 months	**0** per 1000 **2** per 1000 Difference: **2.1 more** per 1000 (CI 95% 1.2 more - 3.8 more)	**Low** Due to serious risk of bias, Due to serious inconsistency	Arthroscopy may have a very small risk for infection
Nerve damage 3 months	Based on data from 12,426 patients in 1 studies. Follow up 3 months	**0** per 1000 **0** per 1000 Difference: **0.24 more** per 1000 (CI 95% 0 more - 0.5 more)	**Low** Due to serious risk of bias, Due to serious indirectness	Arthroscopy may have an extremely small risk of nerve damage
Pain (difference in change from baseline) 3 months	Measured by: Different instruments converted to scale of index instrument (KOOS pain sub scale- MID 16.56) Scale: 0-100 High better Based on data from: 1,231 patients in 10 studies. (Randomized controlled) Follow up 3 months	**15** points (Mean) **20** points (Mean) Difference: **MD 5.38 more** (CI 95% 1.95 more - 8.81 more)	**High**	On average, knee arthroscopy does not result in an important reduction in pain
Pain (difference in change from baseline) 3 months	Measured by: MID units High better Based on data from: 1,231 patients in 10 studies. (Randomized controlled) Follow up 3 months	**0.92** (Mean) **1.26** (Mean) Difference: **MD 0.34 more** (CI 95% 0.07 more - 0.6 more)	**High**	On average, knee arthroscopy does not result in an important reduction in pain
Pain (difference in change from baseline) 1-2 years	Measured by: Different instruments converted to scale of index instrument (KOOS pain sub scale- MID 16.56) Scale: 0-100 High better Based on data from: 1,097 patients in 8 studies. (Randomized controlled) Follow up 2 years	**19** points (Mean) **22** points (Mean) Difference: **MD 3.13 more** (CI 95% 0.17 fewer - 6.43 more)	**High**	On average, knee arthroscopy does not result in an important reduction in pain

Pain (difference in change from baseline) 1-2 years	Measured by: MID units High better Based on data from: 1,097 patients in 8 studies. (Randomized controlled) Follow up 2 years	**1.1** (Mean) **1.3** (Mean) Difference: **MD 0.2 more** (CI 95% 0.05 fewer - 0.45 more)	**High**	On average, knee arthroscopy does not result in an important reduction in pain
Function (difference in change from baseline) 3 months	Measured by: Different instruments converted to scale of index instrument (KOOS ADL sub scale, MID 8.17) Scale: 0-100 High better Based on data from: 964 patients in 7 studies. (Randomized controlled) Follow up 3 months	**9** points (Mean) **14** points (Mean) Difference: **MD 4.94 more** (CI 95% 1.5 more - 8.38 more)	**Moderate** Due to serious riks of bias, borderline inconsistency, and borderline imprecision	Knee arthroscopy may increase function change slightly more than control
Function (difference in change from baseline) 3 months	Measured by: MID units High better Based on data from: 964 patients in 7 studies. (Randomized controlled) Follow up 3 months	**1.4** (Mean) **2.08** (Mean) Difference: **MD 0.68 more** (CI 95% 0.18 more - 1.18 more)	**Moderate** Due to serious risk of bias and inconsistency	Knee arthroscopy probably has little or no difference on function change when compared to control.
Function (difference in change from baseline) 1-2 years	Measured by: Different instruments converted to scale of index instrument (KOOS ADL sub scale, MID 8.17) Scale: 0-100 High better Based on data from: 843 patients in 6 studies. (Randomized controlled) Follow up 2 years	**10** points (Mean) **13** points (Mean) Difference: **MD 3.16 more** (CI 95% 0.48 fewer - 6.8 more)	**Moderate** Due to serious riks of bias and borderline imprecision	On average, knee arthroscopy probably does not result in an important improvement in function
Function (difference in change from baseline) 1-2 years	Measured by: MID units High better Based on data from: 843 patients in 6 studies. (Randomized controlled) Follow up 2 years	**2.7** (Mean) **3.13** (Mean) Difference: **MD 0.43 more** (CI 95% 0.07 fewer - 0.99 more)	**Moderate** Due to serious risk of bias and borderline imprecision	On average, knee arthroscopy probably does not result in an important improvement in function
Quality of life (difference in change from baseline) 3 months	Measured by: EQ5D VAS-MID 12.1 Scale: 0-100 High better Based on data from: 120 patients in 1 studies.	**8** points (Mean) **14** points (Mean) Difference: **MD 6 more**	**Low** Due to serious risk of bias, Due to serious imprecision	Knee arthroscopy may have, on average, little or no difference on QoL change, compared to control.

	(Randomized controlled) Follow up 3 months	(CI 95% 1.5 fewer - 13.5 more)		
Quality of life (difference in change from baseline) 1-2 years	Measured by: EQ5D VAS, 15D (converted to EQ5D scale) - MID 12.1 Scale: 0-100 High better Based on data from: 269 patients in 2 studies. (Randomized controlled) Follow up 1 year	**10.3** points (Mean) **12.4** points (Mean) Difference: **MD 2.12 more** (CI 95% 0.96 fewer - 5.21 more)	**High**	On average, knee arthroscopy does not result in an important improvement in quality of life
Quality of life (difference in change from baseline) 1-2 years	Measured by: MID units High better Based on data from: 269 patients in 2 studies. (Randomized controlled) Follow up 1 year	**0.85** (Mean) **1** (Mean) Difference: **MD 0.18 more** (CI 95% 0.08 fewer - 0.43 more)	**High**	On average, knee arthroscopy does not result in an important improvement in quality of life
Pain and function up to 3 months	Based on data from 316 patients in 3 studies	Three studies that evaluated the effects of knee arthroscopy in pain and function using measures that combined these two outcomes together or than could not be pooled. One study reported a difference in change from baseline in the Oxford knee score that favoured arthroscopy by 4.9 points (95% CI 3.61; 6.20, 114 patients) over steroids injections. A second study reported no differences in the median in an overall self-assessment based on a 7-point ordinal scale (82 patients) when comparing knee arthroscopy to exercise therapy. The third study reported that patients who received intra-articular hyaluronic acid injections reported less pain than patients who received knee arthroscopy (120 patients)	**Moderate** Due to serious risk of bias	Knee arthroscopy probably has little or no difference on pain and function when compared to control
Pain and function 1-2 years	Based on data from 114 patients in 1 studies	One study measured pain and function using a composite score. The study showed that patients who receive arthroscopy have a change in Oxford knee score 2.6 points higher than patients receiving steroid injections (95% CI 1.14; 4.06)	**Moderate** Due to serious risk of bias	Knee arthroscopy probably has little or no difference on pain and function when compared to control

Practical issues	Conservative management	Arthroscopy	Both

 Procedure and device	• Performed by an orthopaedic surgeon in an operating room • General anesthesia • Procedure usually takes < 1 hour. • Small joint incisions through which a camera and surgical tools are inserted • Option to repair or remove torn cartilage	• May be performed in hospital or the community • No general anaesthesia • Injections may use local anesthesia	
 Tests and visits	• Individualized follow-up and wound care is required	• Physiotherapy and intra-articular injections require appointments	
 Recovery and adaptation	• Recovery typically between 2 to 6 weeks • Unable to weight bear for 2-7 days • Physiotherapy and wound care facilitate recovery		
 Exercise and activities	• Avoid strenuous activity during recovery and reintroduce as comfort permits from 2 to 3 weeks and thereafter those causing symptoms	• Restriction of activities which exacerbate symptoms may be advised with all alternative treatments	
 Work and education	• Time until return to work depends on speed of recovery and demands of job (within 1 or 2 weeks for sedentary work; at least 2 weeks if job is more physical).		
 Travel and driving	• Driving is limited for about 1-3 weeks after procedure		
Details about studies used and certainty down- and upgrading			

Pain (difference in patients who achieve a change higher than the MID)	**Intervention reference:** Systematic review **Baseline/comparator reference:** Control arm of reference used for intervention	**Risk of bias: No serious** **Inconsistency: No serious** **Indirectness: No serious** **Imprecision: No serious** **Publication bias: No serious**
Pain (difference in patients who achieve a change higher than the MID)	**Intervention reference:** Systematic review [6] with included studies: **Baseline/comparator reference:** Control arm of reference used for intervention	**Risk of bias: No serious** **Inconsistency: Serious** Not all studies show similar results in terms of magnitude and direction of effect, high statistical heterogeneity. This results in imprecision yet the estimate was rated down only once ; **Indirectness: No serious** **Imprecision: No serious** **Publication bias: No serious**
Function (difference in patients who achieve a change higher than the MID)	**Intervention reference:** Systematic review **Baseline/comparator reference:** Control arm of reference used for intervention	**Risk of bias: Serious** Inadequate/lack of blinding of outcome assessors, resulting in potential for detection bias, Inadequate/lack of blinding of participants and personnel, resulting in potential for performance bias ; **Inconsistency: No serious** **Indirectness: No serious** **Imprecision: No serious** **Publication bias: No serious**
Function (difference in patients who achieve a change higher than the MID)	**Intervention reference:** Systematic review **Baseline/comparator reference:** Control arm of reference used for intervention	**Risk of bias: Serious** Inadequate/lack of blinding of participants and personnel, resulting in potential for performance bias, Incomplete data and/or large loss to follow up ; **Inconsistency: No serious** **Indirectness: No serious** **Imprecision: Serious** The proportion shows a clinically important benefit at the upper end of the CI, while it shows no difference in the lower end ; **Publication bias: No serious**
Quality of life (difference in patients who achieve a change higher than the MID)	**Intervention reference:** Systematic review [6] with included studies: **Baseline/comparator reference:** Control arm of reference used for intervention	**Risk of bias: No serious** **Inconsistency: No serious** **Indirectness: No serious** **Imprecision: Serious** Concerns with regards to some inconsistency that may results in imprecision. Rated down one level to account for both of them. ; **Publication bias: No serious**
Knee replacement	**Intervention reference:** Systematic review **Baseline/comparator reference:** Control arm of reference used for intervention	**Risk of bias: No serious** **Inconsistency: No serious** **Indirectness: No serious** **Imprecision: Serious** The confidence interval suggests that the risk of knee replacement would be reduced by 50% with knee arthroscopy in one extreme, while it could be increased by 600% in the other. In absolute terms this is still very imprecise. ; **Publication bias: No serious**
Mortality	**Intervention reference:** Systematic review **Baseline/comparator reference:** Control arm of reference used for intervention	**Risk of bias: Serious** Most studies are retrospective and the data was not collected with the aim of determining harms of knee arthroscopy. The prospective studies have limitations with regards of inclusion of all consecutive patients. ; **Inconsistency: Serious** Despite an overall low incidence of mortality, in the studies with sample sizes larger to observe events, mortality varied from 2 out of 10,000 to 57 to 10,000 ; **Indirectness: No serious**

		Imprecision: No serious **Publication bias: No serious** Asymmetries in the funnel plot are mainly due to the RCTs having a small sample size and resulting in 0 events ;
Venous thromboembolism	**Intervention reference:** Systematic review **Baseline/comparator reference:** Control arm of reference used for intervention	**Risk of bias: Serious** Most studies are retrospective and did not collect data for the purposes of the study ; **Inconsistency: Serious** In the studies with sample sizes large enough to detect the outcome, the incidence of VTE varied from 22 out of 10,000 to 597 out of 10,000 ; **Indirectness: No serious** **Imprecision: No serious** **Publication bias: No serious**
Infection	**Intervention reference:** Systematic review **Baseline/comparator reference:** Control arm of reference used for intervention	**Risk of bias: Serious** Most studies are retrospective and data was not collected for the purpose of this study ; **Inconsistency: Serious** Incidence of infection varies from 10 out of 10,000 patients to 143 out of 10,000 patients in the studies with a sample size large enough to observe events. However, both magnitudes would still likely lead patients to undergo arthroscopy ; **Indirectness: No serious** **Imprecision: No serious** **Publication bias: No serious**
Nerve damage	**Intervention reference:** Primary study **Baseline/comparator reference:** Control arm of reference used for intervention	**Risk of bias: Serious** Information from a retrospective cohort study, data was not collected for the purpose of the study ; **Inconsistency: No serious** **Indirectness: Serious** The authors included knee arthroscopy due to any case, and there is no information about the proportion of patients who had degenerative knee disease ; **Imprecision: No serious** **Publication bias: No serious**
Pain (difference in change from baseline)	**Intervention reference:** Systematic review **Baseline/comparator reference:** Control arm of reference used for intervention	**Risk of bias: No serious** **Inconsistency: No serious** Although the magnitude of the point estimates seems to be different, and the statistical test of heterogeneity suggests that results are inconsistent, the differences are not clinically relevant and similar conclusions can be drawn from most studies ; **Indirectness: No serious** **Imprecision: No serious** **Publication bias: No serious**
Pain (difference in change from baseline)	**Intervention reference:** Systematic review **Baseline/comparator reference:** Control arm of reference used for intervention	**Risk of bias: No serious** **Inconsistency: No serious** Although the statistical heterogeneity is high, similar conclusions are reached by all included studies ; **Indirectness: No serious** **Imprecision: No serious** **Publication bias: No serious**
Pain (difference in change from baseline)	**Intervention reference:** Systematic review **Baseline/comparator reference:** Control arm of reference used for intervention	**Risk of bias: No serious** **Inconsistency: No serious** **Indirectness: No serious** **Imprecision: No serious** **Publication bias: No serious**

Pain (difference in change from baseline)	**Intervention reference:** Systematic review **Baseline/comparator reference:** Control arm of reference used for intervention	**Risk of bias: No serious** **Inconsistency: No serious** **Indirectness: No serious** **Imprecision: No serious** **Publication bias: No serious**
Function (difference in change from baseline)	**Intervention reference:** Systematic review **Baseline/comparator reference:** Control arm of reference used for intervention	**Risk of bias: Serious** Inadequate/lack of blinding of participants and personnel, resulting in potential for performance bias ; **Inconsistency: Serious** The studies suggest different magnitude of effects, not all CIs overlap, and there is statistical heterogeneity ; **Indirectness: No serious** **Imprecision: Serious** Wide confidence intervals ; **Publication bias: No serious**
Function (difference in change from baseline)	**Intervention reference:** Systematic review **Baseline/comparator reference:** Control arm of reference used for intervention	**Risk of bias: No serious** **Inconsistency: Serious** The magnitude of statistical heterogeneity was high, with I^2: 56%. ; **Indirectness: No serious** **Imprecision: No serious** **Publication bias: No serious**
Function (difference in change from baseline)	**Intervention reference:** Systematic review **Baseline/comparator reference:** Control arm of reference used for intervention	**Risk of bias: Serious** Inadequate/lack of blinding of participants and personnel, resulting in potential for performance bias ; **Inconsistency: No serious** **Indirectness: No serious** **Imprecision: Serious** Wide confidence intervals ; **Publication bias: No serious**
Function (difference in change from baseline)	**Intervention reference:** Systematic review **Baseline/comparator reference:** Control arm of reference used for intervention	**Risk of bias: Serious** **Inconsistency: No serious** **Indirectness: No serious** **Imprecision: Serious** **Publication bias: No serious**
Quality of life (difference in change from baseline)	**Intervention reference:** Primary study **Baseline/comparator reference:** Control arm of reference used for intervention	**Risk of bias: Serious** Patients were not blinded, and there were 12.5% of patients and 23.7% of patients lost to follow-up in the intervention and control groups, respectively ; **Inconsistency: No serious** **Indirectness: No serious** **Imprecision: Serious** The confidence interval suggests no difference on one extreme and a difference higher than the MID in the other extreme ; **Publication bias: No serious**
Quality of life (difference in change from baseline)	**Intervention reference:** Primary study **Baseline/comparator reference:** Control arm of reference used for intervention	**Risk of bias: No serious** **Inconsistency: No serious** **Indirectness: No serious** **Imprecision: No serious** **Publication bias: No serious**

Quality of life (difference in change from baseline)	**Intervention reference:** Systematic review **Baseline/comparator reference:** Control arm of reference used for intervention	**Risk of bias: No serious** **Inconsistency: No serious** **Indirectness: No serious** **Imprecision: No serious** **Publication bias: No serious**
Pain and function	**Intervention reference:** Systematic review	**Risk of bias: Serious** Concerns with lack of blinding and patients reported outcomes ; **Inconsistency: No serious** **Indirectness: No serious** **Imprecision: No serious** **Publication bias: No serious**
Pain and function	**Intervention reference:** Systematic review	**Risk of bias: Serious** Concerns with regards to allocation concealment, lack of blinding and patient-reported outcomes ; **Inconsistency: No serious** **Indirectness: No serious** **Imprecision: No serious** **Publication bias: No serious**

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