Red Whale

In association with VERSUS ARTHRITIS

Osteoarthritis

"My knee's playing up again, doc. No, I've not been taking regular painkillers. I don't want to get immune to them before I really need them, and I worry about exercising because that will wear out my joints faster. My family says I'm in awful pain and should get a wash-out at least, or perhaps a replacement."

This article has been updated using an excellent Lancet seminar (Lancet 2019;393:1745). Other articles and guidelines are specifically referenced as they appear.

Headlines

- Osteoarthritis is rapidly growing in prevalence due to ageing and obesity.
- It is a **clinical diagnosis** and imaging is often overused.
- Core treatments are self-management, education, exercise and weight loss.
- Surgery should be reserved for when these core treatments have failed.
- It commonly co-exists as part of a multimorbidity picture, and is associated with increased mortality.

What's the problem?

Osteoarthritis is a huge and growing problem. The combined effects of an ageing population and rising levels of obesity have created a perfect storm for global rising prevalence.

The medical cost of osteoarthritis is estimated to be between 1 and 2.5% of GDP in high-income countries, with hip and knee replacements representing a high proportion of this cost.

Indirect costs of disability, e.g. work lost, early retirement, are likely even higher.

What is osteoarthritis?

Humbling though it is, we don't fully understand this! The correlation between symptoms and clinical/radiological findings is poor!

Understanding of the pathogenesis of osteoarthritis is evolving (Lancet 2019;393:1745). The knee is the most commonly-affected joint, followed by the hands, then the hip. It should be considered as a 'syndrome' rather than a single disease.

- It is now recognised to be a disease of the **whole joint** affecting bone, cartilage, ligaments, capsule, synovium and muscle.
- There is no evidence of ***systemic*** inflammation, but local inflammatory factors *may* be created as chondrocytes attempt to repair damaged cartilage. Changes in local metabolic processes, e.g. fat metabolism, may also be a factor. Synovitis is commonly noted in osteoarthritic joints (JAMA 2021;325:568).
- It is not passive 'wear and tear' but rather an imbalance between repair and destruction of joint tissue: the disease model is one of **overuse/overload, flare and repair.** The repair process is slow and usually results in a pain-free, but structurally-altered joint.
- If there is an overwhelming insult, the repair process does not compensate fully, leading to continuing tissue damage with loss of function, pain and, eventually, 'joint failure'.

It can also be seen as a persistent pain syndrome.

Risk factors and prevention

It is worth being aware of the modifiable risk factors.

Modifiable	Non-modifiable
Knee injuries	Genetic tendency
Obesity	Female sex (not for hip)
Knee extensor muscle weakness	Advancing age

Occupational, e.g. farming, construction High-impact sports (dose-dependent)	Knee malalignment Congenital hip deformity

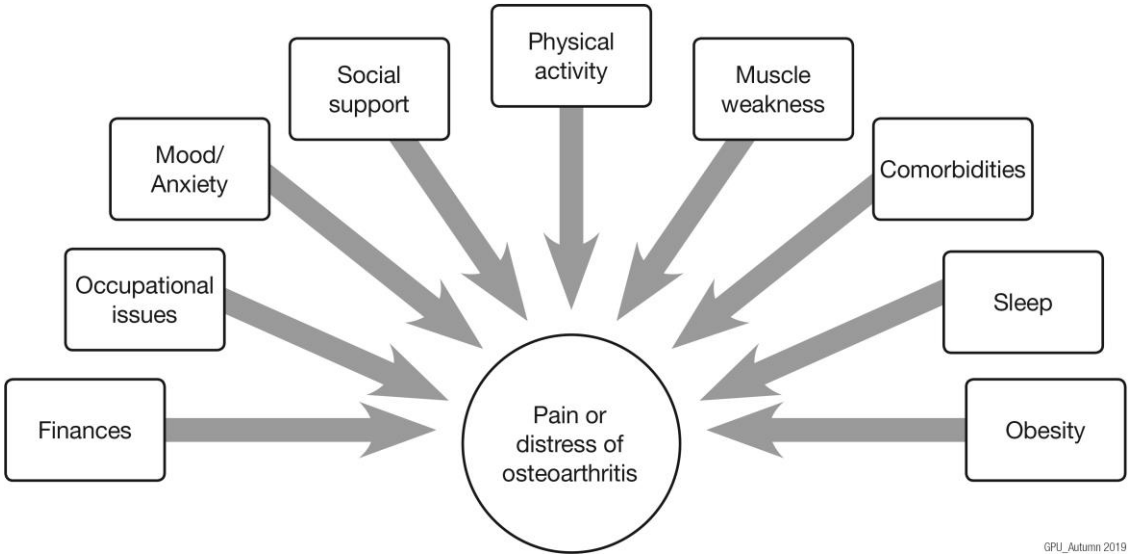
The lifetime risk of symptomatic knee OA is greater in those with obesity (19.7% vs. 10.9%). Prior joint trauma such as ACL rupture accounts for 12% of knee OA cases. Knee OA that develops following anterior cruciate rupture may have a different mechanism of development from that associated with obesity (JAMA 2021;325:568).

Risk is not increased with recreational physical activity (NEJM 2021 381;1:51).

There is limited evidence to confirm whether intervention in modifiable risk factors makes a difference. A single RCT has shown that for overweight or obese patients who are able to lose 5kg or 5% of their body weight and sustain that loss, there is a 3-fold reduction in development of osteoarthritis 6 years down the line. Specific neuromuscular training programmes may reduce the risk of knee injury in high-risk sports, e.g. football.

What causes pain in osteoarthritis?

There is *no single* thing that causes pain in patients with osteoarthritis – it is best framed within a biopsychosocial model. An example of this is shown below:



The advantage of this model is that it shows multiple places where small interventions/self-management strategies can have impact. These are the key factors we need to consider when discussing and framing the core treatments as recommended by NICE below.

There are likely elements of nociceptive and neuropathic pain, the latter due to both peripheral and central sensitisation.

Historically, studies have shown poor correlation between radiographic changes in osteoarthritis and reported pain experienced.

Pain from knee OA is associated with younger age, female sex, non-white race, lower educational level, obesity, burden of coexisting conditions, psychological factors (e.g. depression, low level of self-efficacy and catastrophising) and pain sensitisation. As disease progresses, increasing pain (perhaps not associated with any deterioration on radiographs) may occur due to pain sensitisation, adaptations to chronic pain or reduction in activity to avoid pain (NEJM 2021 381;1:51).

NICE guidance on osteoarthritis

In producing its guidance, NICE recognises that the evidence base is imperfect because of short-term studies, often limited to single joints, and the exclusion of frail patients with comorbidity. Most studies are done on a single intervention. NICE also issued guidance on joint replacement surgery in June 2020 and this is covered in the *Joint replacement surgery: preoperative and postoperative care* article.

Osteoarthritis: care and management in adults (NICE 2014, CG177)

Risk factors

NICE reminds us that there are modifiable and non-modifiable risk factors.

- Obesity.
- Biomechanical, e.g. occupation, history of injury/fracture, postoperative.
- Genetic tendency.

Making a diagnosis

A working diagnosis of OA can be made **without an X-ray** if:

- Patient >45y.
- >3m joint pain that is worse with use.
- Any morning stiffness they might have lasts no more than half an hour.
- And an alternative diagnosis is unlikely.

We should rule out red flags, including malignancy, infection or inflammatory arthritis.

MANAGEMENT OPTIONS

Non-drug treatments

Use a biopsychosocial approach. Offer all patients with osteoarthritis three core treatments:

- **Information:** written and verbal information about OA to counter misconceptions. This should be ongoing.
- **Exercise:** advice on exercise and physical activity (local muscle strengthening, stretching and general aerobic fitness).
- **Weight loss interventions (if appropriate)**.

Consider:

- Manual therapy, supports, braces, insoles.
- Local heat/cold applications.
- TENS.

NICE does NOT recommend the following:

- Nutraceuticals such as glucosamine.
- Acupuncture.

Analgesia (and see discussion below)

Paracetamol	First line.	NNT = 7 (CI 4–23)
Topical NSAID	First line (especially knee/hand).	NNT = 2–3
NSAID (oral) or COX-2	Second line (lowest dose, shortest duration).	–
Opioids	Second line if paracetamol ineffective and NSAID not suitable/effective. N.B. since this guideline was published, there has been much more data on the role of opioids, and they should be used sparingly: see article on *Chronic pain: opiates and dependence-forming medications*.	–

Joint injections

- Trial a steroid joint injection for appropriate joints (NNT = 5–8).
- Do not offer hyaluronan injections.

Referral for surgery

Before referral, ensure patients have been offered the core treatment options.
Decisions about referral should **not** be based on scoring tools but on the impact joint symptoms are having on quality of life *(though some scoring tools are based on this!).*
Referral should be considered before there is prolonged and established functional limitation and severe pain. Patient-specific factors such as age, sex, smoking, obesity and comorbidities should not be barriers to referral.

- Do not refer for non-replacement surgery (such as arthroscopic lavage or debridement) unless there is clear history of mechanical locking (NICE makes it clear that the radiological evidence of loose bodies or a history of the joint giving way do NOT count). *Evidence is ahead of this guideline and arthroscopy is no longer recommended.*

Now we will answer some frequently asked questions and have a closer look at the evidence.

Differential diagnosis

If we are making a clinical diagnosis of osteoarthritis, it is important that we have a clear idea of what else it *could* be. Here we consider the differential diagnosis for the common joints (BMJ 2016;354:i3405):

Hip	Knee
Referred pain from the spine	Medial collateral ligament strain
Lateral hip pain syndrome	Pes anserine bursitis
Femoroacetabular impingement	Patellofemoral syndrome
Osteonecrosis of femoral head	Patellofemoral OA
Meralgia paraesthetica	Patellar tendinopathy
	Pre-patellar bursitis
	Iliotibial band syndrome
	Meniscal pathology

You may find the articles on *Hip pain in young adults* and *Non-traumatic knee pain* helpful.

Baker's cyst

A Baker's cyst (a.k.a. popliteal cyst) isn't a true cyst. It's a posterior extension of the synovial swelling in a knee effusion which may be palpable in the popliteal fossa. A knee effusion in OA is generally small or absent. A larger effusion may indicate an inflammatory flare or another possible cause, e.g. pseudogout (JAMA 2021;325:568). We generally talk about secondary Baker's cysts which occur due to underlying knee joint disease, e.g. OA. You might encounter a primary cyst, i.e. one occurring in a normal knee, but these mainly occur in children.

Complications of Baker's cyst

- Pain.
- Rupture (which can cause calf swelling and a 'query-DVT' presentation).
- Haemorrhage.
- Compression of nearby structures.
- Infection.

Management of secondary Baker's cyst in adults

(NICE CKS 'Baker's cyst' (May 2020) https://cks.nice.org.uk/topics/bakers-cyst/ [accessed June 2021])

- Consider DVT! See your local pathway, NICE guideline or our online article/GEMS.
- Treat the underlying condition (usually OA).
- No treatment if asymptomatic (other than presence of swelling/lump).
- Consider simple analgesia.
- Refer to rheumatology or orthopaedic surgery if the diagnosis is in doubt, very symptomatic or very large.
  - Secondary care may choose to image using MRI or ultrasound.
  - Further treatment may include knee effusion aspiration +/- corticosteroid injection, or guided cyst aspiration +/- intra-cystic corticosteroid injection.
- *NICE states that direct aspiration of a Baker's cyst in primary care is not recommended.*

When is imaging helpful?

Plain X-rays are the investigation of choice but **should only be done at a point when they will change management** (usually if there is diagnostic uncertainty or at the point of considering surgery). This is because the Framingham Osteoarthritis study showed (BMJ 2016;354:i3405):

- Many people with pain don't have X-ray changes.
- Many people with X-ray changes don't have pain.

Fundamentally, it is a clinical diagnosis.

Knee X-ray should be done, if possible, with the patient standing as this will more accurately reveal the extent of joint space narrowing. You may need to specifically request this in your clinical details box. Weight-bearing is not required for hip X-ray.

MRI is rarely indicated in the assessment of knee or hip OA.

What information do patients with osteoarthritis want?

The first core treatment that NICE recommends is offering information. There is consensus between patients and experts as to what information they would want to be offered (Lancet 2019;393:1745). This includes:

- Information about the disease, e.g. not an inevitable part of getting older.
- How to achieve regular physical activity.
- Individualised exercise plans.
- How to lose weight.
- That surgery is often **not** necessary.
- The reasons why imaging is not helpful.

How can we achieve this in practice?

We can deliver this in the initial consultation and support it with written information (see useful resources below). Some practices have used group consultations to deliver this information to patients with good effect. This is an area you could work together as PCNs to redesign care pathways and ultimately utilise first-contact physiotherapists to support this education package.

Exercise and osteoarthritis

Exercise has been shown to be beneficial for a range of important measures for people with hip and knee osteoarthritis (Cochrane Syst Rev 2018;4:CD010842). A range of different exercises including land and water-based, Tai Chi etc. can:

- Reduce pain by 6% (CI -9% to -4%).
- Improve physical function.
- Improve quality of life.
- Reduce depression (though it had no impact on anxiety).

But won't exercise make knee osteoarthritis worse?

- A systematic review of older adults with knee osteoarthritis showed no increase in pain and no progression of disease on imaging with exercise (Osteoarthritis Cartilage 2015;23:1445).

There was also a qualitative component to the meta-analysis that considered how we can be more effective at delivering advice about exercise. The key points were:

- Promoting that exercise is safe and beneficial (*we need to be careful about the language we use –'wear and tear' and 'degenerative' change do not sound very conducive to exercise!).*
- Tailor exercise advice to individuals' preferences and baseline. Pacing and grading can be important here to ensure patients don't get into a 'boom/bust' cycle.
- Provide ongoing support – perhaps through a coaching approach?

There are lots of free resources that our patients can use to access exercise programmes and pace and grade their activity levels. Links to some of these can be found below.

Weight loss for OA

Weight loss is a core treatment. For overweight patients, 5% weight loss is recommended because (BMJ 2016;354:i3405):

- There is good evidence that weight reduction improves pain and disability in knee osteoarthritis (there is less evidence of impact on pain and disability in hip osteoarthritis).
- It improves surgical outcomes for all joint replacements.

The combination of dietary modification and exercise was more effective than either sole intervention in an RCT looking at knee osteoarthritis in overweight or obese patients. A meta-analysis showed moderate reductions in pain with diet and exercise but not with diet alone (NEJM 2021 381;1:51).

Analgesia for OA

There is no tablet that will cure osteoarthritis. Exercises to strengthen the muscles supporting the knee and hip have greater benefits on pain and disability than any analgesia.

Paracetamol

- Paracetamol is no better than placebo for hip and knee pain (there was benefit but it was clinically insignificant).
- There were no differences between placebo and paracetamol in adverse events, refuting NICE's concern that paracetamol was associated with significant adverse events (RR 1.0, CI 0.9–1.1).

It remains first line because it is safe and cheap, but will not work for most – so stop if no benefit (BMJ 2015;350:h1225).

Topical NSAIDs

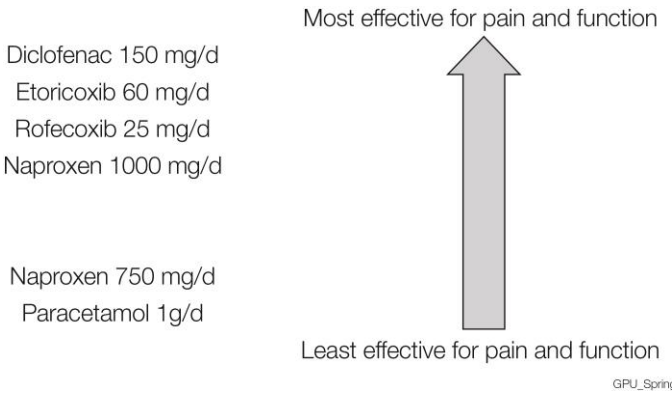
Older studies have demonstrated that for knee and hand osteoarthritis (but not hip), topical NSAIDs are as effective as oral NSAIDs and have fewer-side effects – they should be considered first line (BMJ 2008;336:138). So far, no serious gastrointestinal or renal side-effects have been demonstrated (Lancet 2019;393:1745).

Oral NSAIDs in OA

Our patients are right….not all NSAIDs are equal!

A large meta-analysis of high-quality RCTs including more than 58 000 patients looked at the effectiveness of different NSAIDs and COX-2 inhibitors compared with paracetamol or placebo for the management of OA pain. **Importantly, the meta-analysis did not explicitly consider safety.** It used a measure called 'effect size' so it is not possible to calculate NNTs (Lancet 2016;387:2093). It found that:

- The effect of different NSAIDs varied greatly, and there was a dose-dependent effect on pain and function.



- Diclofenac 150mg/d was the most effective in terms of pain and function.
- Paracetamol and naproxen 750mg daily had almost no effect on pain or function.
- The meta-analysis suggests that a 'typical patient' with OA has a 100% probability of a clinically meaningful improvement when taking diclofenac 150mg/d, rofecoxib 25mg/d or etoricoxib 60mg/d.

A massive systematic review and meta-analysis in the BMJ looked at the effectiveness and safety of NSAIDs in hip and knee osteoarthritis. The authors again found that diclofenac 150mg/d and etoricoxib 60mg/d were the most effective drugs, but, in practice, their use was often constrained due to comorbidities or adverse effects. Topical diclofenac was found to be effective and safer than oral options. The authors recommended it as first-line pharmacological treatment for knee osteoarthritis (BMJ 2021;375:n2321)

The authors are quick to point out that these benefits must be considered alongside the risks that these drugs pose. This is explored in detail in the article *NSAIDs: effectiveness and safety* in the online handbook.

What does this mean in practice?

NSAIDs vary widely in their effectiveness, with the most effective carrying the highest cardiovascular risks. Benefits must be weighed against harms, particularly in an elderly polypharmacy population – so, most of our OA patients. For low-risk individuals with significant pain and functional impact, diclofenac may still be a good choice!

Opiates

A systematic review and meta-analysis in the BMJ looking at 192 trials and over 100 000 patients concluded that any benefits of opioids, regardless of preparation or dose, failed to outweigh the harms (BMJ 2021;375:n2321).

Tramadol is often seen as 'opiate-lite' but there is a good body of evidence now emerging that this is not the case. In the management of osteoarthritis, a large cohort study of nearly 90 000 patients has demonstrated an association between increased mortality at 1y in patients prescribed tramadol compared with an initial prescription of NSAIDs. There was no difference in mortality in comparison with people prescribed codeine. This is an association; causation cannot be determined, and the result may reflect the underlying comorbidities of patients in whom we choose a mild opiate rather than NSAID (JAMA 2019;321(10);969).

Other drugs

Duloxetine reduces pain in knee OA significantly more than placebo in RCTs (JAMA 2021;325:568) but is not in the NICE osteoarthritis guideline (CG177). If the pain is chronic, NICE reminds us that we can adopt some of the management from its chronic pain guideline (NG193 2021), which *does* allow us to consider antidepressant therapy (even in the absence of depression). Duloxetine may be particularly helpful in those with widespread pain or depression.

A double-blind RCT in New Zealand assessed a tricyclic antidepressant (nortriptyline) for analgesia in knee osteoarthritis. No significant benefit was found and the adverse effect profile was in line with expectations (BJGP 2021;e538).

Disease-modifying treatment for osteoarthritis

This has been an area of intensive research activity but, as yet, no disease-modifying treatment has been demonstrated to have significant benefits, and no drug has been licensed for this purpose. There are 7 agents currently in late-stage trials – so watch this space (Lancet 2019;393:1745). The HERO trial that looked at hydroxychloroquine in hand osteoarthritis did not show any significant effect over placebo (Osteoarthritis Cartilage 2017;S1-S7:53).

A 2022 network meta-analysis in the DTB evaluated the use of 12 drugs and herbal remedies, looking for evidence of benefit on progression of hip and knee osteoarthritis (DTB 2022;60:4). The drugs it looked at were diacerein, bisphosphonates, strontium, doxycycline, licofelone (a COX-inhibitor), inducible nitric oxide synthase inhibitors and matrix metalloprotease inhibitors. There was no evidence of clinically meaningful benefit on joint structure, pain or function for any of these treatments.

Alternative oral remedies and OA

Although herbal and alternative remedies are widely used by our patients with OA, there is no meaningful evidence that they have lasting benefit over placebo in terms of joint structure, pain or function. However, they CAN interact with other medication, so ask about their use!

The DTB has assessed several compounds, including avocado/soybean unsaponifiables, Indian frankincense (Boswellia serrata), rosehip (Rosa canina), vitamin D, vitamin E, chondroitin and turmeric (DTB 2012;50:8, DTB 2022;60:4).

Our patients often ask about glucosamine, but the evidence is underwhelming, it isn't cost-effective and it isn't recommended by NICE.

As clinicians, we may take the view that these remedies are unlikely to do harm, but we must consider the financial harm to our patients, many of whom may lack disposable income to spend on things which have evidence of absence of benefit.

Magnetic resonance therapy for knee osteoarthritis

NICE looked at this novel magnet-based therapy for knee osteoarthritis (NICE IPG702).

What is it? In outpatients, a device is placed on the knee. It generates electro-magnetic fields around the knee joint for an hour. The course of treatment is 5–10 sessions on consecutive days.

How does it work? The proposed theory: magnetic fields promote joint healing and reduce pain. NICE saw no evidence to clarify a mechanism of action.

What did NICE say? Current evidence shows no benefit over placebo. The evidence is of inadequate quality and quantity. It should not be used unless as part of a research study. On the bright side, it did note that there were no major safety concerns.

- **Bottom line: safe but ineffective (based on current evidence).**

Glucosamine and cardiovascular disease

"OK…but should I take glucosamine as well as aspirin for my heart, Doc?"

Just when you thought you had stopped hearing about glucosamine from your patients, a study pops into the headlines that convinces them they should have been taking it for their hearts all along. The headline read:

"5p pill cuts risk of fatal heart attack by a 5th"

Sounds pretty good! But what's the evidence?

A large cohort UK study of more than 450 000 participants aged 40–69y without known cardiovascular disease used UK biobank data to explore the relationship between *reported* glucosamine use and CV events. Follow-up was for at least 7 years. It measured CVD death, coronary heart disease and stroke events. It attempted to correct for confounding, e.g. lifestyle factors, other drug and supplement use, smoking (BMJ 2019;365:l1628).

The study found:

- 20% of participants were regularly using glucosamine (and were more likely to be female and follow a healthier, more active lifestyle.
- At 7y, 2.2% of the cohort had suffered a cardiovascular event.
- Reported glucosamine use was associated with a lower risk – a 15% relative risk reduction in CV events and up to 22% reduction in fatal heart attack or stroke.
- This benefit was stronger in current smokers.
- Predictably, the ABSOLUTE risk was much less impressive at 0.2% for cardiovascular events.
- **That means we would have to treat 500 people for 7 years with glucosamine to prevent 1 cardiovascular death.**

This is an imperfect study that can only show correlation – we don't know that it was the glucosamine that caused this reduced risk! Important information about how long people used glucosamine or what dose they took is not available. The baseline characteristics of the people using glucosamine were that they followed a healthier lifestyle of their own accord prior to the study, and not all of these lifestyle factors could be controlled for in the analysis.

So, bottom line: we can advise our patient that the jury is still out on whether glucosamine will help their heart, and that stopping smoking and getting moving are definitely still *much* more important for reducing risk.

Intra-articular steroid injections

Hip osteoarthritis

A well-designed, UK primary care-based RCT took 199 patients with hip OA and randomised them to receive standard treatment (advice and education) or standard treatment plus ultrasound-guided intra-articular corticosteroid and local anaesthetic injection. The primary outcome was self-reported hip pain score at intervals over 6 months.

- There was greater reduction in pain in the corticosteroid injection group.
- Those noted to have ultrasound-confirmed synovitis or hip effusion benefitted the most from the injection.

The authors concluded that ultrasound-guided intra-articular hip injection of corticosteroid is a viable treatment option for hip OA (BMJ 2022;377:e068446).

Intra-articular hip injection usually needs imaging (ultrasound or fluoroscopy), so we're going to need to refer.

- Are you able to refer directly to radiology on ICE for this, or do you have to use a local MSK or orthopaedic service?
- Who might be the best candidates? Hip injections aren't part of routine care but it could be a useful tool in the box:
  - Consider those patients not fit enough for surgery due to comorbidity?
  - Consider those who don't want surgery or have been told they're "too young" and "come back in 5 years"?
  - Consider someone who wants to manage the condition medically for a period of time, e.g. until retirement, or while caring for family?

Knee osteoarthritis

Steroid injections are a common treatment used in primary care for knee osteoarthritis, though the evidence base for treatment is far from conclusive and studies are small and heterogeneous. The available evidence was considered in a BMJ Uncertainties article (BMJ 2020;368:6923). The authors conclude that intra-articular steroids for knee osteoarthritis ***may:***

- At best, improve pain and function in the short term (<8 weeks) but any benefit is not usually sustained beyond 3 months.
- Confer a small risk of joint deterioration (thinning of cartilage) and worsening symptoms over the long term, and this is increased with repeat injections.

What does this mean in practice?

We have to weigh the short-term benefits against potential longer-term harms. The author argues they *may* have a place in the frail elderly where a joint replacement may not be an option. However, for younger and middle-aged patients, the longer-term consequences may be more important. Active treatments, particularly weight loss and exercise, should be prioritised.

A small US RCT comparing physiotherapy with triamcinolone injection for knee osteoarthritis supports this conclusion. The mean age of participants was 56 years, and they were ex-military veterans (so may not be entirely generalisable). Those having physiotherapy had less pain and better function at 1 year compared with those who had the steroid injection (NEJM 2020;382:1420). **We should offer core treatments first.**

Hyaluronic acid

One of the pathophysiological observations in osteoarthritis is that the viscoelasticity of synovial fluid appears to be reduced. Hyaluronic acid is one of the constituents of synovial fluid. It is claimed that synthetic hyaluronic acid preparations injected straight into affected joints (usually the knee) can improve viscoelasticity, and *hypothesised* that they may prevent further cartilage degeneration. Does it work?

- A meta-analysis of 14 double-blind RCTs comparing hyaluronic acid with saline injections did not show any clinically significant difference in outcomes (Lancet 2019;393:1745).

A new formulation 'Durolane-Bioventus' has recently been approved by the FDA in the USA on the basis of 5 imperfect studies in which Durolane was shown to either be 'non-inferior' to other hyaluronic acid preparations or, when compared with saline placebo, to have an insignificant clinical benefit. One small open-label (not blinded) study in the UK demonstrated a benefit in pain and reduced analgesia use (JAMA 2018;320(21):2262).

Given the results of the above meta-analysis, this new data does not seem a convincing reason to start to use these injections!

NICE recommends that we should not offer hyaluronic acid injections.

Knee arthroscopy

The key message is simple:

Don't do it!

The BMJ published a rapid recommendation because it felt no further evidence was necessary to draw firm conclusions (BMJ 2017;357:j1982). The conclusion is based on 13 RCTs and more than 1600 patients.

In patients with degenerative knee disease including osteoarthritis and meniscal tears, ***even in the presence of mechanical symptoms,*** when compared with any conservative management (including drugs, physiotherapy and steroid injections), arthroscopy offers:

- No significant short-term benefit in pain or function.
- No significant long-term benefit in pain or function.
- Small but significant short-term harms in terms of venous thromboembolism or infection.
- A recovery period of 2–6w, even in the absence of complications.

It is therefore not clinically or cost effective.

Since then, a further RCT comparing partial meniscectomy with physiotherapy showed that physiotherapy was not inferior to surgery (JAMA 2018;320(13)1328). The adverse outcomes of partial meniscectomy in the UK over a 6-year period were quantified, and serious harms were seen in a little over 0.3% of cases (Lancet 2018;392:2194).

Is there *any* role for knee arthroscopy?

Yes – it may have a role in the management of acute knee trauma, e.g. cruciate injuries and displaced obstructive 'bucket handle' meniscal tears where partial meniscectomy has been shown to be effective.

Joint replacement surgery

NICE recommends referral when symptoms are having a significant impact on quality of life and function, and non-surgical treatments are not relieving this. All people considering joint replacement should be offered support to make a decision, and there should be an explicit discussion of alternatives to joint replacement, potential benefits and risks, and options for analgesia and anaesthesia (NICE NG157 2020).

Postoperative complications are higher in smokers and obese patients, but these factors alone should not be a barrier to referral (though in some areas they are criteria in the referral process); using the shared decision-making tools will highlight these to patients.

The Lancet recently reviewed the current state of evidence for hip and knee replacements (Lancet 2018;392:1662; Lancet 2018 ;392:1672). We summarise the pertinent points for primary care in this table.

	Total hip replacement	**Total knee replacement**
When should they be done?	For end-stage osteoarthritis where pain and stiffness are no longer manageable without surgery. Surgery is rarely indicated in the absence of full thickness cartilage loss.	For end-stage osteoarthritis where pain and stiffness are no longer manageable without surgery. Patients with very poor functional status prior to surgery have worse outcomes, so surgeons are increasingly expressing caution about allowing too much deterioration prior to referral.
How long will they last?	95% last beyond 10 years. 58% last 25 years (Lancet 2019;393:647). Lifetime revision risk depends on age: 50–55y: 30%. 70–74y: 8%.	Revision rates are reported at 3–5% at 10 years. Recent UK data shows: • 82% of total knee replacements last 25 years. • 70% of unicompartmental knee replacements last 25 years (Lancet 2019;393:655).
Dissatisfaction rates	Weak evidence base but dissatisfaction reported in 5% of patients.	20% of patients are dissatisfied with outcome (see below).

Are knee replacements the 'gold standard' treatment?

A small trial of 100 patients with moderate to severe knee osteoarthritis randomised patients to an intensive package of physiotherapy, dietary advice, insoles (for which evidence is pretty limited!) and pain medication, OR total knee replacement followed by 12w of the intensive package of physio, etc. (NEJM 2015;373:1597). The primary outcome measures were pain, function and quality of life, but complications were also considered.

	Surgical group	Intensive input
Greater than 15% improvement in pain at 12m follow-up	85%	68%
Serious adverse events	48%	12%

What is surprising here is how well those who did not have surgery did!

At the end of the trial, the patients in the non-surgical management group were offered the opportunity to have a total knee replacement, and only 26% chose to do this. The authors expected that more would do so as time went on.

The risks of TKR are:

- Perioperative mortality: 0.5–1% in the first 90d.
- Serious complications, e.g. DVT, infection and fracture: occur in up to 3% of patients.
- Significant pain at 6m: 20% of patients.

What does this mean in practice?

This was a very small trial, but, as the editorial comments, while total knee replacement was significantly superior to non-surgical treatment in terms of pain and function, it was also associated with significant complications (NEJM 2015;373:1668).

This supports patient choice, but is also good evidence for commissioners that well-designed knee services offering non-operative management can offer significant benefits for patients who might otherwise need surgery.

Cost-effectiveness

An interesting US-based cohort study of more than 4000 patients looked at the cost-effectiveness of total knee replacements in terms of QALYs as they are performed in the USA (so, significantly more frequently than in the UK). It found that, overall, total knee replacements had minimal impact on QALYs for the whole cohort but could be seen as a cost-effective intervention if restricted to those with more severe functional impairment. This supports current UK practice (BMJ 2017;356:j1131).

Partial vs. total knee replacement

For patients with unicompartmental osteoarthritis, there is a choice between partial or total knee replacement. A recent systematic review and meta-analysis showed that in this scenario, partial knee replacements have shorter hospital stays, fewer complications, lower infection rates and better functional outcomes. However, they have higher revision rates (BMJ 2019;364:l352).

Since then, the fabulously named UK-based 'TOPKAT' RCT has reported. It randomised more than 500 patients with medial compartment osteoarthritis to total or partial knee replacement and followed them for 5 years. It demonstrated no statistically or clinically significant difference between the procedures or reoperation rates, but partial knee replacements were less expensive by 5 years. On this basis, it recommended that partial knee replacement should be first choice (Lancet 2019;394:746).

NICE recommends that people with isolated medial compartment knee osteoarthritis should be offered a choice between total and partial replacement (NICE NG157 2020).

Scoring systems and shared decision-making

NICE states that we should not use scoring systems to determine who should be referred for surgery, and acknowledges that while they may be useful for shared decision-making, there is insufficient evidence to recommend a specific tool or scoring system (NICE NG157 2020). Many CCGs/MSK pathways ***do*** require us to use them.

They are formalised ways of assessing the impact of symptoms on quality of life and function (BMJ 2016;354:i3405):

- Randomised trials have shown that these are useful to both patients and clinicians.
- They can be helpful in shared decision-making with the patient and in deciding who to refer. The most commonly-used example is the Oxford Hip Score and the Oxford Knee Score (see Useful websites box, below).

An alternative is the MSK-HQ score, designed and validated by ARUK (now Versus Arthritis) – it can be used for any MSK pain condition.

Personally, I find these pretty useful – both at diagnosis and as a guide to functional impairment and pain, and thus the need for surgery.

The importance of shared decision-making is emphasised throughout these reviews of surgical options (Lancet 2018;392:1662; Lancet 2018 ;392:1672). Shared decision-making tools allow patients to personalise their current symptoms, priorities, lifestyle factors and surgical risk, and review their options.

You may have examples of these tools locally. If not, resources are linked below.

Walking aids and osteoarthritis

Walking sticks

A tiny Brazilian RCT of individuals with knee OA randomised people to a walking stick (and a 5min session from a physio on how to use it) or no stick (Arch Rheum Dis 2012;71:172).

- **The walking stick group had less pain and better quality of life** (pain scores had improved more than would be achieved through any non-surgical intervention!).

To make sure the stick helps, it needs to be the correct size!

- **With the patient standing up straight, with arms by their side, the stick should come to the distal wrist crease**. This means that, when the patient stands holding the stick, their elbow is flexed by 20–30°.
- The stick should be used on the **opposite side to the affected knee** because this means the arm swings with the affected knee, maintaining a normal gait pattern, and the stick shares the load with the knee.

Wedge insoles

Wedge insoles are recommended in some guidelines to help patients with knee osteoarthritis, but the (limited) available evidence base does not support this.

This Australian study took 200 patients ≥50y with mild to moderate knee arthritis and randomised them to use full-length 5-degree lateral wedge insoles or flat insoles for 12m (BMJ 2011;342:d2912).

- Wedge insoles had no impact on pain, function or structural change on MRI. We should not recommend them.

Chronic pain management

NICE NG193 (2021) reminds us to consider chronic pain management strategies in those with chronic secondary pain (pain due to an identifiable nociceptive source), particularly if the pain or its impact is disproportionate to its underlying cause. Resources include Escape Pain (see the box at the end of article).

Meta-analyses of pain management programmes show small to moderate effects in self-efficacy in patients with knee osteoarthritis. Pain-coping skills training targets catastrophising, which can otherwise lead to fear-avoidance of physical activity and reduce the likelihood of participation in other healthy behaviours (NEJM 2021 381;1:51).

You may find the article on Chronic pain: NICE guideline helpful.

Osteoarthritis and multimorbidity

The Lancet article reminds us (Lancet 2019; 393:1745):

- Osteoarthritis is associated with a small increased risk of cardiovascular disease.
- It has also been associated with a small increased risk of stroke, even after correcting for NSAID use.
- Disease-specific mortality for CV disease, cancer and dementia is also higher.

This association has not been fully explored but the authors suggest it may relate to common disease pathways, e.g. inactivity, fat metabolism and the innate immune system in chronic low-grade inflammation.

In addition, many patients with osteoarthritis have additional comorbidities.

- >50% have hypertension.
- 20% have CV disease.
- 19% have dyslipidemia.

- 14% have diabetes.
- 12% have mental health disorders (most commonly depression).

The presence of one or more of these conditions increases the rate of progression and pain experienced.

Osteoarthritis

- Osteoarthritis is a condition of overuse, flare and repair.
- X-rays are not needed for diagnosis.
- Assess and address pain from a biopsychosocial perspective.
- All patients with OA should receive education and exercise advice and lose weight.
- Analgesia may be helpful for 'flares' (paracetamol and topical NSAID first line, then oral NSAIDs) – but avoid opiates.
- Joint replacement surgery should be considered when pain cannot be managed or function is significantly impaired.
- Arthroscopies no longer have a role in the management of knee OA.
- Walking sticks do help and need to be the correct size.

Reflect: do you routinely consider the pain of osteoarthritis within a biopsychosocial model? If not, try this out for 3 consultations. What impact did it have? Did it change your management?

Look back on the last 10 patients you saw with arthritis:

Did you order an X-ray, and, if so, why? Which of the 3 core treatments did you recommend?

For the next 10 people you see with walking sticks:

Are they the correct height? Do they have a good ferrule on the end?

This is an excellent patient information book that is free to download:
https://www.keele.ac.uk/media/keeleuniversity/ri/primarycare/pdfs/OA_Guidebook.pdf

Versus Arthritis produces good patient leaflets on exercises: follow links from:
https://www.versusarthritis.org/media/21789/osteoarthritis-exercise-sheet.pdf

Escape Pain also delivers self-management exercise programmes to patients with chronic pain conditions:
http://www.escape-pain.org/

The NHS fitness studio has lots of options for patients who want to exercise at home:
https://www.nhs.uk/conditions/nhs-fitness-studio/

Information to support patients with pacing and grading activity can be found here:
https://www.paintoolkit.org/pain-tools/pacing

Shared decision-making tools:
https://musculoskeletal.cochrane.org/sites/musculoskeletal.cochrane.org/files/public/uploads/What%20are%20my%20options%20for%20managing%20hip%20or%20knee%20osteoarthritis%20%20June%2015.pdf