



The Upside

Tips and tools from pro team docs to make your health, wellness, and fitness the best it can be.

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We've outlined below some general descriptions and guidelines based on our experience. Each person's situation will be unique, and for treatment recommendations appropriate for you, we recommend proper evaluation and treatment by your physician. You may read our full disclaimer [here](#).

Knee arthritis is extremely common in active adults. Cartilage is a smooth gliding surface that covers the ends of each of the bones inside all of our joints in the human body. Normal cartilage has an ultra smooth glass-like surface and has a thickness and resiliency.

"Arthritis" means that there has been some wearing out of the normal cartilage. This often means that there is a roughening of the cartilage surface and the cartilage tends to lose some of its resiliency and volume. The most common form of arthritis is called osteoarthritis otherwise known as "wear and tear arthritis". There are several different types of inflammatory arthritis as well, with rheumatoid arthritis being one of the most common forms.

We currently do not have a cure to reverse arthritis, but there are many types of available treatments to help manage pain and maintain healthy activity levels. In this newsletter we will describe several of the nonsurgical and noninvasive treatments for arthritis, we will then cover some of the newer injectable therapies, and finally touch upon some possible surgical options.

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Noninvasive and Nonsurgical Treatments – Appropriate for All Types of Arthritis

LOW-IMPACT EXERCISE

Walking is one of the most effective low impact exercises available for knee arthritis, and it is available to pretty much everyone. Published reviews of available high-quality evidence shows that land-based exercises such as walking can provide good reductions in pain and improvements in physical function.

You can even turn walking into an interval training program where you would walk fast for one minute, walk slow for two minutes, and then repeat this cycle. Interval training programs are some of the most effective ways to improve heart and lung health.

Walk to the level of time and intensity that you can comfortably maintain. Try not to force yourself to walk to the point where you are in a lot of pain.

PRO DOC ADVICE

DOES IT WORK?

Definitely yes. Movement is essential to overall health and is a proven benefit for anyone with arthritis.

SHOULD YOU DO IT?

We recommend walking or other low impact exercises (such as swimming, cycling, or Pilates) for all of our patients with knee arthritis. Stay within a reasonably comfortable zone and don't push yourself into pain.



Resistance training for strength is another key exercise option to help reduce knee pain from osteoarthritis. The problem for a lot of folks though, is that resistance training can produce knee pain. Bodyweight squats can be an effective way of strengthening the glutes, quads, and lower leg musculature. You can modify the range so you don't do as deep a squat, and you can reduce the number of repetitions. Both of these modifications may make it more comfortable for you to do the exercise.

We are excited about a new mode of therapy called **blood flow restriction training**. This type of training involves placement of a band or strap on the upper thighs. Blood flow returning to the heart is slightly restricted. This has a hormonal effect during the exercise that can be very beneficial. It allows the usage of much lower loads for resistance than would be used in traditional strength training, which has the huge benefit of reducing loads across an arthritic joint. This means that you can get a very effective strength training exercise but without harmful loads that would otherwise lead to knee pain. Discuss blood flow restriction therapy with a personal trainer or physical therapist.

PRO DOC ADVICE

DOES IT WORK?

Yes. There is well-documented scientific evidence of the benefits of improved strength in reducing knee pain from arthritis.

SHOULD YOU DO IT?

If you're new to strength training we recommend you initially work with a physical therapist. There is a balance between working hard enough to increase strength and working too hard and producing pain. A physical therapist is a skilled professional who can guide you appropriately. We also recommend that you consult a physical therapist about blood flow restriction therapy before you try this on your own.



Blood flow restriction training can help you get stronger without increasing knee pain.

WEIGHT REDUCTION

During normal walking there is a brief period of time when 5x to 7x body weight is placed across the knee joint. So for a 200-pound person 5x stress equals 1000 pounds. Multiply that by 10,000 steps and now you're talking about a huge amount of load across your knee joint!

The good news from this multiplier effect is that even small amounts of body weight loss can have a positive effect on your comfort level. Using the same math that we used above, 10 pounds of weight reduction results in a 50-pound decrease in load across the knee joint. In addition, there is evidence that suggests that excess body fat is associated with increased inflammation. By losing body fat you can decrease inflammation in your body.

For most adults dietary modifications are the most effective means to lose weight. Work with a nutritionist or other professional to optimize your diet first, and then combine this with an exercise program.

PRO DOC ADVICE

DOES IT WORK?

Yes. Even small amounts of weight reduction will reduce load across an arthritic joint, and reduced load means reduced pain. Most individuals will notice a benefit with 5 to 10 pounds of weight reduction.

SHOULD YOU DO IT?

Yes. We strongly recommend weight reduction for all patients with knee arthritis even if you're already in an optimal weight range. You may need to consult your primary care doctor or a nutritionist if you need specific strategies.



PHYSICAL THERAPY

Askilled physical therapist has received professional training to assist people with all kinds of musculoskeletal impairments, including arthritis. The physical therapist can assist you with appropriate strengthening programs, range of motion, improvements in your gait, and can also use various modalities to assist with pain relief.

PRO DOC ADVICE

DOES IT WORK?

Generally yes, although some people with more advanced stages of arthritis may not achieve much improvement. We find physical therapy to be very helpful for knees with mild to moderate arthritis.

SHOULD YOU DO IT?

It's definitely worth a try if you're aiming to take the least invasive approach to your knee pain.

Supplements

Supplements are frequently touted in the media as potential "cures" for arthritis. You need to be very careful about the claims that are being advanced, and also be careful about the quality of the supplement. We have reasonable evidence of effectiveness of three types of supplements: glucosamine, chondroitin, and turmeric.

Glucosamine sulfate is a naturally occurring substance in the body and a key component of the articular cartilage. Glucosamine sulfate is available without prescription. Glucosamine sulfate typically comes combined with chondroitin sulfate and is most commonly available as a pill form that is taken twice per day as "extra strength".

Turmeric, a spice commonly used in Middle Eastern and Asian foods, is also available in a capsule form and has been shown to have some anti-inflammatory effects in the body. There is very little published evidence about its effectiveness for knee arthritis pain, however we tend to recommend it as it is extremely safe and easy to take. The upside of taking these supplements is the low risk

for negative side effects, and some reasonable published evidence of effectiveness. There are some people who do get some stomach upset from taking these however we find that they are very well tolerated by the vast majority of people. The only downside is that you typically would have to take the supplements for about 2 to 3 months before you know whether they are having any effect on your pain.

PRO DOC ADVICE

DO THEY WORK?

Maybe. Glucosamine, chondroitin, and turmeric have been through scientific study and the results are variable.

SHOULD YOU TAKE THEM?

If you're looking to try everything you can to improve your comfort level, improve your function, and avoid surgery then it's reasonable to try glucosamine, chondroitin, and turmeric.

Medication Treatments for Mild Pain

People with knee arthritis experience pain at different levels. You may be surprised to know that there are some people who have very severe arthritis on an x-ray or MRI scan who have remarkably little pain. And at the other end of the spectrum some people with seemingly milder forms of arthritis on imaging can have a substantial amount of pain and limited function. Orthopedic surgeons tend to place great emphasis on an individual person's level of pain when we decide upon appropriate treatments.

TYLENOL

Tylenol is an easy to take and easy on the stomach first-line medication to use for mild pain. It has a very good safety profile and can be used by most people, unless you have a specific medical contraindication such as kidney disease. There is good quality evidence that shows mild to moderate pain relief can be achieved. The typical dose is 1000 mg (two extra strength pills) taken two or three times per day on a regular basis. Tylenol is a mild pain reliever and is not an anti-inflammatory medicine.

OVER-THE-COUNTER ANTI-INFLAMMATORY MEDICATION

“Over the counter” is a phrase used for medications that do not require a doctor's prescription. For mild pain you can use anti-inflammatory medications such as ibuprofen (brand names: Advil, Motrin, etc.) or naproxen (brand name: Aleve). For people with mild pain we would typically recommend that you use these medications on an as-needed basis. For example if you have occasional soreness after a tennis match, these medications would be appropriate to use after activity.

We also recommend using these medications preemptively if you know that you are going to have a particularly strenuous activity. For example if you are going on an extensive hike you may want to take the medications before the hike in order to try and prevent any inflammation and pain. The dosing for these medications will be as written on their labels.

PRO DOC ADVICE

COMMON BRAND NAMES

Motrin, Advil, Ibuprofen, Aleve, Naprosyn

DO THEY WORK?

Yes. Almost everyone will have some amount of pain relief from over the counter anti-inflammatory medication.

SHOULD YOU TAKE ONE?

These are good choices if you have occasional mild to moderate activity related pain. We would not recommend long-term use of over the counter anti-inflammatory medicines as there can be side effects requiring careful monitoring.

TOPICAL ANTI-INFLAMMATORY: DICLOFENAC

A medication in the form of a cream or gel that is rubbed on the surface of the skin is called a topical medication. A topical anti-inflammatory such as Diclofenac (brand name: Voltaren) is another good choice for people with mild pain. There is some published evidence of its effectiveness, and it does tend to work better for mild pain than for

more significant levels of pain. However it carries the excellent advantage of having essentially no side effects on the stomach. We tend to prescribe topical Voltaren for individuals who have stomach sensitivity from anti-inflammatory medication pills, and use it for mild and moderate levels of pain.

PRO DOC ADVICE

DOES IT WORK?

Generally yes. There is some evidence for topical Diclofenac effectiveness for mild to moderate knee arthritis pain.

SHOULD YOU TRY IT?

Topical Diclofenac is a good choice if you have mild to moderate knee arthritis pain, and you wish to avoid taking any pills. A topical medication is definitely a good choice if you're on a blood thinner, or have a stomach, liver, or kidney condition in which you can't take an anti-inflammatory pill.

Medication Treatments for Moderate Pain

Once again, we tend to base our treatment recommendations on amounts of pain and limitations in function rather than purely upon what an imaging study looks like. There are a number of available choices for individuals with moderate amounts of pain.

PRESCRIPTION ANTI-INFLAMMATORY MEDICATION

We have a large number of anti-inflammatory medications available by prescription. The potential for pain relief is better than can be achieved with over-the-counter medications, however the potential for side effects also increases. The prescription medications may simply be stronger versions of the over-the-counter medications, or different classes of medications altogether.

We look carefully at an individual's overall medical history when prescribing anti-inflammatory medications, especially their history of any issues with the gastrointestinal tract, cardiovascular risk, and impaired kidney function. We will

often involve the patient's primary care doctor as they may have a more detailed knowledge of the patient's specific medical conditions.

If we anticipate long-term usage of an anti-inflammatory medication, we will typically prefer a class of anti-inflammatory called a Cox-2 selective inhibitor. These are appropriate for individuals with normal cardiovascular and kidney function. Medications in this class include meloxicam (brand name: Mobic) and celecoxib (brand name: Celebrex). Both of these medications are now available in generic form, making it easier for us to obtain insurance authorization.

If you have increased cardiovascular risk or kidney risk, we will want to involve your internist in the decision, and possibly specialists as well. We will often recommend injectable therapies rather than pills if you are on blood thinners, have increased cardiovascular risk from other issues, or have kidney disease.

PRO DOC ADVICE

DO THEY WORK?

Generally yes. These medications have been prescribed for decades with excellent effectiveness.

SHOULD YOU TAKE ONE?

Prescription medications have the potential for side effects, and should be discussed carefully with your doctor. Long-term use will require monitoring of your liver and kidneys. But in general, we commonly prescribe prescription anti-inflammatory medications for active individuals with moderate arthritis knee pain.

Injection Treatments for Moderate Pain

CORTISONE

For decades, orthopedic surgeons have performed joint injections with "cortisone" for pain relief and anti-inflammatory effect. These injections can be effective for short-term relief of symptoms, but the effects tend to wear off after a few weeks.

These days we tend to use betamethasone (brand name: Celestone) or triamcinolone (brand name: Kenalog). These are injected directly into the joint and typically produce pain relief starting within a few hours and reaching maximal effectiveness after two or three days.

There are several advantages to cortisone injections. They are covered by insurance companies, easy to perform in the office, and have very few if any side effects on the body as a whole.

The disadvantages to cortisone are that they are generally not appropriate for longer-term pain management. There is some evidence that shows that repeated cortisone injections can actually cause breakdown of healthy tissues in and around the joint. Additionally there may be other side effects such as impairments to bone blood flow. For these reasons we tend to perform a maximum of two or three cortisone injections per year into any joint.

PRO DOC ADVICE

DO THEY WORK?

Generally yes, with most patients achieving some amount of pain relief from a cortisone injection. It may not eliminate the pain but should help. Results may wear off in 2-4 weeks but can last many months in some instances.

SHOULD I GET ONE?

If you have an immediate need, like "I need to feel better today" then a cortisone injection is a good idea. We don't recommend repeated cortisone injections to the same joint too close together. Another injection spaced out by several months is generally safe.

INTERESTING NEW INJECTION: ZILRETTA, A LONG-LASTING CORTISONE

In 2018 the FDA approved for general use a long-lasting form of triamcinolone called Zilretta. We have been recommending this injection for selected patients over about the last six months. In our early use we find that we are having good success with insurance approval, which can be difficult for some of the other injection therapies. We are also finding that the pain relief results can last 4

to 6 months. Zilretta is appropriate for individuals with moderate pain.

PRO DOC ADVICE

DOES IT WORK?

Early published clinical results are very encouraging. At least 2/3 of patients had significant pain relief from mild to moderate pain that lasted at least 12 weeks, with many patients having pain relief out to 6 months.

SHOULD I GET ONE?

We've had good experience with Zilretta injection in people who need longer term relief than standard cortisone, and in people who wish to avoid pills. Early experience with insurance coverage is also very good.

HYALURONAN (ALSO KNOWN AS "HYALURONIC ACID")

"Synovial fluid" is the name for the naturally occurring lubricant found in all of our joints. It helps to improve the gliding surface of the cartilage and also provides nutrition to the joint.

Hyaluronan is a normal component of the joint fluid. For reasons that are not well understood, the concentration of hyaluronan decreases in people with knee arthritis. Many years ago, veterinarians purified hyaluronic acid from rooster combs and injected it into arthritic joints of large animals. Based upon those successes formulations were eventually developed for human use. We have been injecting hyaluronic acid into osteoarthritic knees for about two decades now.

We tend to use hyaluronan injection in people in whom a cortisone injection has had good but temporary relief of symptoms, and a longer-term therapy is necessary. Our preference is to use single injection hyaluronan therapies or a series of three injections that are synthetically derived rather than animal derived.

One of the potential benefits of hyaluronan injection beyond the pain relief is that there is some clinical evidence that the hyaluronan may slow down the arthritic process or delay the need for knee replacement.

Several insurers in 2018 stopped approving hyaluronan injection as a covered benefit. We are finding almost universal "no" decisions from Blue Cross and Blue Shield. If you have one of those insurers we may advise you on alternative injection therapies, such as Zilretta.

PRO DOC ADVICE

DOES IT WORK?

There is debate about the effectiveness of hyaluronan injection, which is why some insurers do not cover it. However, more recent research indicates that it is at least as effective as cortisone, lasts longer, and has the potential to slow down the disease process.

SHOULD I GET ONE?

We recommend hyaluronan injections for people in whom cortisone has not been helpful for moderate pain. We may also recommend hyaluronan for people with severe arthritis who wish to avoid surgery or cannot have surgery.

PLATELET RICH PLASMA ("PRP")

Platelets are cells found in the blood, and are involved in tissue repair from injury and involved in blood clotting. For example, if you get a cut in your skin, platelets help create the scab and ultimately help heal the cut.

Platelets are an excellent source of tissue repair growth factors. Clinicians discovered a number of years back that it is possible to take a tube of a person's own blood, spin the blood in a centrifuge for a few minutes, and create a concentration of the person's own platelets, called platelet rich plasma (PRP).

The PRP is then injected into various sites requiring tissue repair. Sports medicine clinicians have been using PRP injection for soft tissue conditions such as tendinitis or muscle tears with excellent success for a number of years.

Recent clinical studies have shown effectiveness of PRP injection for knee arthritis pain relief. Additionally, there is some evidence to suggest that PRP may actually slow down the worsening of the arthritis over time.

The only real downside of a PRP injection is that it is not covered by insurance.

PRO DOC ADVICE

DOES IT WORK?

There is debate about the effectiveness of PRP injection, which is why insurers do not cover it. However, recent research indicates that it is at least as effective as cortisone, lasts longer, and has the potential to slow down the disease process.

SHOULD I GET ONE?

We recommend PRP injections for people in whom cortisone has not been helpful for moderate pain. We may also recommend PRP for people who prefer to have a biologic treatment rather than a medication. In addition, we have had good success when combining PRP with hyaluronan injections.

Alternative Therapies

ACUPUNCTURE, ELECTRICAL STIMULATION, TENS THERAPY

There are a number of noninvasive alternative therapies that are touted for pain relief in knee osteoarthritis. Acupuncture, electrical stimulation, and TENS therapy are reported to improve knee pain in some individuals with knee osteoarthritis.

There is a limited amount of scientific evidence to support effectiveness of these treatments. However, some patients do achieve good pain relief. We generally view these as reasonable options if a person is inclined to pursue them, because there is very little risk in attempting them.



PRO DOC ADVICE

DO THEY WORK?

Maybe, but for each treatment there is only a small amount of evidence about whether they work.

SHOULD I TRY THEM?

The nice thing about these treatments is that there's no harm in trying. It's a matter of personal preference.

Stem Cell Injections

"Stem cells" are the body's building blocks. These are cells from which all other cells with specialized functions are created. Under the right conditions in the human body or in a laboratory, stem cells have the potential to repair damaged tissue. However, when treating osteoarthritis, evidence suggests that stem cells might provide important growth factors that modify a person's symptoms rather than regenerate cartilage or repair damaged tissue. We still have much to learn about the actual results that can be achieved from the injection.

In an adult, stem cells can potentially be obtained from a variety of sources. Orthopedic researchers have focused on usage of bone marrow or fat as potential sources for stem cells. Additional research is needed regarding the best place to obtain stem cells.

We would also strongly caution consumers to avoid wild or unsubstantiated claims of total disease reversal. These claims, which can be commonly found on the Internet, are almost completely without merit. Fees charged by the practitioners can be exceptionally high. The US Food and Drug Administration has imposed stiff sanctions and in some cases closed clinics that have marketed themselves through these types of claims.



Stem cell injections are promising but we have much to learn about the actual results.

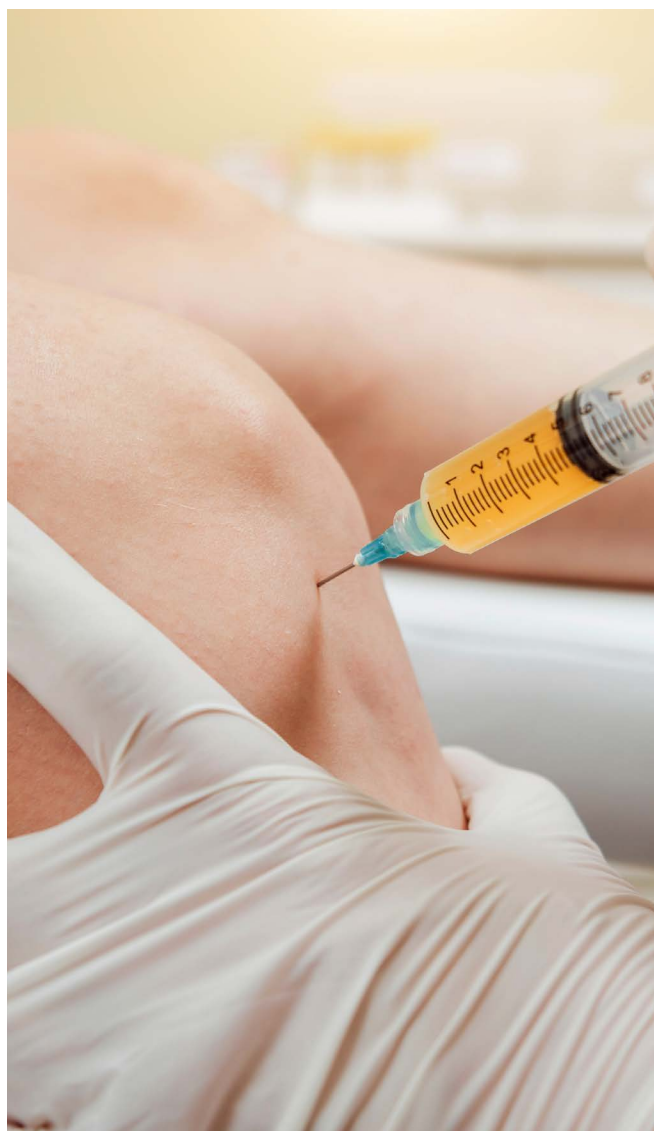
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DO THEY WORK?

Maybe. We are optimistic but currently there is not enough data for us to widely recommend stem cell injection therapy.

SHOULD I GET ONE?

We do not recommend dropping in to a "clinic" you found on the Internet for something marketed as a stem cell injection. We are doing bone marrow or fat derived stem cell injections in very selected cases, often in conjunction with surgery. At this time we are recommending you have a careful discussion with a physician with substantial experience in stem cell or related therapies before proceeding.



Surgery

A thorough discussion of possible surgical options is beyond the scope of this newsletter. Possible surgical options can include a technique called arthroscopy in which damaged tissue inside the joint is “cleaned up”. In some instances we may recommend various cartilage resurfacing procedures.

Additionally, there are more invasive techniques that can be very appropriate in the right circumstances. These would include a realignment procedure called an osteotomy, a partial knee replacement, or even a total knee replacement. The decision to proceed with surgery and the type of surgery is highly individualized and will need to be discussed very carefully with your orthopedic surgeon.

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DO THEY WORK?

The range of procedures available is large and so discussion about effectiveness will need to take place between you and your surgeon. Under the right circumstances, a surgical procedure can have a huge positive impact in pain relief, function, and quality of life.

SHOULD I HAVE SURGERY?

This highly individual decision should be thoroughly discussed with your orthopedic surgeon.

For More Information:

- [Sideline Sports Doc blog](#)
- [Brian Cole MD](#)
- [Synergy Orthopedic Specialists Medical Group](#)
- [American Academy of Orthopaedic Surgeons](#)



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