

Painful Knees!

by James Bone

James Bone is physiotherapist, Yoga therapist, Bowen therapist and author. He is a member of AAYT (Australian Association of Yoga Therapists) and IAYT (International Association of Yoga Therapists.) In this article, he shares his perspective on knee pain. The article was written for Yoga therapists but it is equally useful for Yoga teachers and Yoga students alike.

Knee pain is a major problem, especially for people over 50. It can limit activity and so cause other problems associated with inactivity such as an increased risk of diabetes and heart disease. The pain can be disabling and cause much suffering to people.

One of the goals of Yoga is the relief of suffering. So what can Yoga therapists do to approach knee pain conditions, utilising Yoga-based exercise? Before we look at some of the specific conditions associated with the knees, remember that many things can cause knee pain and diagnosis is not the job of a Yoga therapist unless you have additional diagnostic training. Refer to an appropriate therapist such as a physiotherapist musculo-skeletal doctor or orthopaedic specialist.

Muscle Inhibition—wasting away

Knee pain generally causes a reflex inhibition of the inner quads called Vastus Medialis Obliques (VMO) and this muscle can quickly waste away, even within a few days.

Osteoarthritis—a pain in the joints

Knee arthritis is one of the most common forms of osteoarthritis (OA). OA is an adaptive response of a joint, leading to thinning and lost cartilage, and then compensation by forming bony growths to try to decrease joint stress.

Anterior Knee Pain—full frontal

Another common condition is anterior knee pain related to the kneecap (patella). This condition is more common in women due to the wider pelvis.

Ligament Injury and Instability—wobbly knees

Injury to ligaments are usually a result of trauma. Minor injuries may be characterised by local pain or swelling. Severe injuries are usually associated with some form of joint instability, chronic knee swelling and the knee 'giving way'. Surgery is often the only solution.

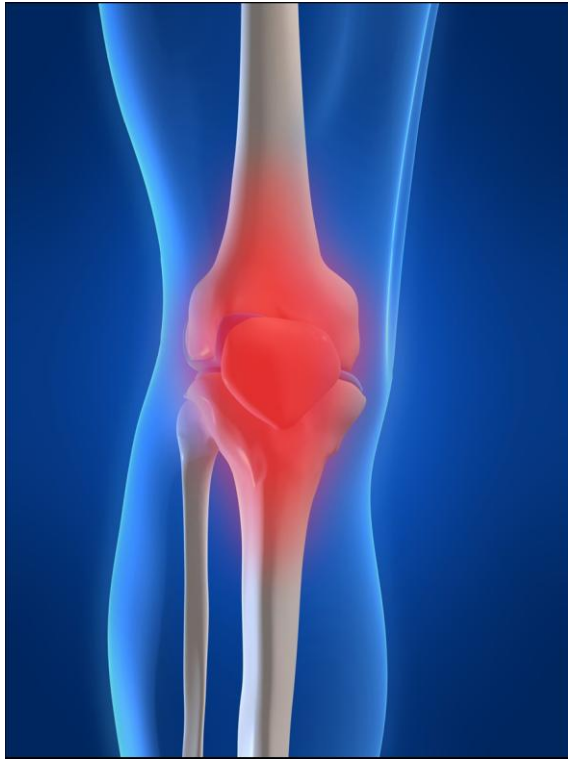
Meniscus Pain

This can occur as a result of injury, often a twisting injury, or degeneration. This condition often feels as though the 'knee locks' and can be very painful to straighten the knee or take weight on the knee when locked.

Overuse Pain—wear and tear

People doing repetitive activities such as running, jumping or cycling may become subject to repetitive 'wear and tear' problems. Generally, I find repetitive problems are associated with imbalances at the pelvis, hip or foot and don't resolve properly until the imbalances are rectified. Reduced activity or rest may also be required.

Be wary of nasty pain due to infections, cancer or inflammatory disease. This is often characterised by severe night pain, severe swelling, pain not settling, the person reporting unwell feelings or unusual symptoms—refer immediately to their doctor for investigation.



Psychological Factors and Neurophysiology Related to Pain

The knee is an area which may also be subject to stress and emotional factors. Many people have x-ray changes indicating arthritis but get no pain, while other people with minor degeneration can have severe pain.

An interesting study in England found that people with arthritis process pain in brain areas concerned with fear and emotions. These people used more of their medial brain pain systems which are associated with emotions, threat and focus.

Pain is very complex. People feel pain when the brain interprets threat—threat is not always physical or real, but a personal interpretation of the situation, based upon past experiences and other events in a person's life. This process occurs unconsciously—so it is not simply 'wishing it away'. Threat can increase stress and adrenaline. Sensory nerves especially associated with pain can become sensitised by increased adrenaline.

In other words our pain sensitivity is enhanced by stress and adrenaline. Reduce the threat and stress and pain can be reduced. Learning that things are OK and safe over time can greatly reduce a person's suffering—what we often do in Yoga!

Weight—overload

Knee pain is also aggravated by being overweight or obese. This may be for mechanical reasons, but may also related to alterations to blood circulation, just like increased weight increases the risk of heart disease.

Ayurveda—science of life

My first Ayurvedic teacher suggested that it was also worth checking if there are digestive problems, especially if there are problems to both knees and elbows.

The marma points around the knees and elbows relate to the Nabhi marma found at the navel, which is also related to the Pitta dosha.

Marma points are special points (much like in acupuncture) related to consciousness and energy flow, found at junction areas described in Yoga's sister science called Ayurveda. Pitta dosha is one of the three aspects which makes up a person's mind-body type as described in Ayurveda. It is related to the elements of fire and water, and so relates to digestion and transformation.

Knees Respond to Kindness

The following are some simple strategies which may help when approaching knee problems:

- ☐ provide a friendly environment which reduces threat and stress—this can reduce nerve sensitivity and pain
- ☐ provide education—this helps to reduce the person's fear and help them understand what they need to do to help themselves. Let people know that stress and fear can increase their pain. Encourage them that something can be done to reduce pain and may even stop its progression.
- ☐ reduce physical stress on the knee (see tips below)
- ☐ reduce weight if this is an issue—researchers have found that regular yoga practice is associated with less middle age spread
- ☐ strengthen the knee and its supporting thigh muscles
- ☐ correct specific body imbalances— if this is beyond your ability work with a physiotherapist
- ☐ see if there is a relationship between emotional and stress issues and pain

Reduce Physical Stress

How can one reduce physical stress on the knee? By increasing AWARENESS of normal movement habits—the basic principle of yoga.

☐ Listen to how your client walks, runs, jumps or steps down. Clunking and heaviness can indicate too much joint impact. Get them to become aware of these sounds and sensations. Get them to lighten up and step with more quietness.

☐ When they are walking or running check they are not over-striding, i.e. heel strike falling forward of their base of support.

☐ When stepping down have them aware of using their muscles to control the movement—muscles are natural shock absorbers.

☐ When jumping get them to be aware of bending their knees to absorb the force.

☐ When bending the knees to go up a step or to squat down, keep the weight towards the heels and avoid the knee coming forward of the toes—this can greatly reduce knee strain.

☐ When prescribing Yoga be careful with the knee joints. Avoid twisting the knee or stressing the sides of the knees. The knee is primarily a hinge joint. Twisting movements need to come from the hips. If the hips are tight then do knee stretching only in safe ways eg. avoid hurdlers stretch (triang mukhaikapada paschimottanasana). You can help protect knees by

using the foot lock (padabandha). Activate the foot lock by slightly pushing the foot down and at the same time flex the toes up—see how the muscles lightly tighten around the ankle and knee to provide support.

- Avoid locking the knees backwards when standing. Keep the knees unlocked with tone in the thighs—ready for movement.

- Enhance good alignment. Misalignment may stress the knee cartilage or other structures. Check your client—do their kneecaps turn inward, do their arches collapse inward, do their knees appear misaligned? You can help them to correct this by using the hip outward rotator muscles or foot arch* muscles.

***Foot Arch Lifting**

Maintain the weight evenly on the feet—inside and outside, ball and heel. Get your client to lengthen the toes and press the tips to the floor and see if the inner arches lift. Does this help correct the knee alignment? If needed, use the muscles at the front and rear of the inside ankle to help lift the inner arch. Be careful not to just roll the weight to the outside of the foot.

- If the knee is bent, as in lunging forward in Virabhadrasana I or II, or squatting down or getting in and out of a chair, the hip outward rotators can be used to bring the knee more aligned to the feet.

- In lunges, generally position the centre of the knee over the ankle with the middle of the patella directed toward the second toe. People with knee problems often respond better with less knee bend than the traditional 90 degree—a 30 or 60 degree bend places much less stress on the knee joint.

- The opposite misalignment can occur where the knees roll outward too much, as occurs with 'duck feet'. 'Turn out' problems can stress both knees, the foot arches and the big toe joint leading to increased risk of bunions. This problem may occur due to tightness of the outer hip muscles, or the iliotibial band, tight calves or weak inward rotators of the hips.

Let's Get Stronger

A systematic review has shown that the most important thing you can do to help prevent and relieve knee pain, especially related to arthritis, is EXERCISE.

Having strong muscles to support the knee can act as shock absorbers and this seems to protect the knee from strain and help prevent pain, especially for arthritis. The interesting question is whether it is the exercise which helps, or the change in the person's perception of threat, which makes the pain less.

I suspect that when you feel stronger in the body, you also feel stronger within—more resilient, more able to cope with what is thrown at you in life.



Research also suggests that the best time to exercise is when your condition is minor to moderate. Start early when the symptoms are just starting, rather than leaving it to when it becomes a severe problem. It is more difficult to get good knee pain relief when the problem is severe—this unfortunately is when more drastic treatments or even surgery is needed. There are many exercises you can use to help strengthen your knees and lower limbs—the key thing is to monitor and assess. Finding the right exercise/practice, performing it in the right way, doing it at the right time, can take some trial and error.

□ *Non Weight Bearing Exercise*, where the knee moves without your body weight going through it, is a good ‘back to basics’ practice to correct muscle imbalances and can be used if there is only a little knee inflammation or pain. This is also a good way to activate the inner knee muscle (VMO) which is part of the thigh. Dysfunction of this muscle is often associated with knee pain, especially anterior knee pain.

□ Check and see if the VMO is working. The VMO is located on the inside of the thigh just above the knee. You can usually locate it about 3 finger widths above the medial (inner) superior (top) corner of the patella. Compare one side to the other. While the client is sitting get them to straighten their knee and observe/feel the VMO. A poor functioning contraction or lateral tracking of the patella could indicate a VMO problem.

To help activate the VMO get the person to feel the muscle, look at it, straighten the knee and see if they can make the VMO contract. Try to get them to contract the VMO early on in knee extension, before lateral movement of the patella. It may help to flex the foot up, or to turn the knee outward slightly, or slightly contract the inner hip muscles. I have also found breathing to be helpful. Have the person exhale as they focus on straightening the knee and activating the VMO.

See if they can progress to activating VMO in Dandasana. As the person becomes more skilled with VMO activation they can progress to trying to activate VMO in weight bearing exercises. Stop if there is any knee pain as pain will just lead to more VMO inhibition. I believe the key to approaching exercise or yoga practice is in a non-threatening and systematic way—reducing stress and fear, enhancing confidence and aiding in better conditioning of the body.

□ *Weight Bearing Exercise*, where the knee movement includes body weight, is more functional and helps to strengthen muscles in co-ordination with each other. These types of exercises are more in line with yoga, where the action is more integrative than specific.

Many yoga standing postures are weight bearing. I often teach Utkatasana in a chair as a 'sit to stand' practice—a simple practice very grounding for people who tend to lift their energy or are too much in their heads.

The magic of yoga style exercises is that it is wholistic and integrative, improves awareness and, with correct focus, increases control, such as with dysfunctional muscle patterns like VMO. Flexibility may be helpful, but strength and control is what research shows gives people the most benefit from knee pain. We need to fully incorporate the principles of *sthira* (control/stability) with *sukha* (comfort).

I generally begin weight bearing practices in an isometric way (without movement), holding for short periods and using low-stress knee bend positions. The pressure on the knee increases with the angle of the bend when taking weight.

- 0-30 degrees - gentle
- 30-60 degrees—moderate, modified position
- 60-90 degrees—strong, classic position
- Beyond 90 degrees—very strong and not recommended for people with knee pain issues, e.g. deep squats

People with severe knee arthritis may find knee bends uncomfortable or there may be a lot of knee grating called crepitus. Standing balances with slight knee bend may be better than lunging practices. Later, one can progress towards more dynamic practices.

Activation of VMO in the weight position is just as important as for the non weight bearing position. I find that proper positioning of the knee and lifting the foot arch can help to activate this inner knee muscle. Experiment with different lunges—front lunge (Virabhadrasana I) tends to have neutral or slightly internal rotation effect on the hips, while side lunge (Virabhadrasana II) has a more external rotation influence on the hips, which may influence the activation of the VMO.

Yoga balance exercises can also be a great way to get muscle co-contraction between the quads (knee extensors) and hamstrings (knee flexors). Co-contraction can increase joint pressure, but can be helpful for people with joint instability problems that can occur with knee ligament injuries. While performing yoga balance routines, keep the knee slightly flexed and focus on feeling the front quads and hamstrings muscles are active. It may help to keep weight to the heel to aid the activation of the hamstring muscles.

More care needs to be taken with weight bearing exercises if there is knee pain or swelling—usually it just needs some adjustment, re-alignment or re-activation of key muscles such as the VMO, the arch muscles and pelvic control muscles, so the action can be performed with minimal pain or strain.

In other words, just employing good yoga techniques of awareness, correct practice, breath control, patience and understanding. The use of supports, blankets and rolls may also be used to aid comfort and alignment.

Be wholistic

A balanced yoga practice should also include spinal stability work, including bridging, bandhas and core work such as front and side planks, and foot control practices. Flexibility practices may include hip mobility, lateral thigh, quads, calves and hamstrings—lying half moon, twists, revolving lunges, hip release sequence (Pavanmuktasana), downward facing dog—may all be considered but performed with great control and care.

Relaxation, healing imagery, breathing and pranayama may also be helpful to release fear, stress and pain. I find Shavayatra—61 point relaxation and Marma Point relaxation from Vasistha Samhita especially helpful. However, nothing helps like a listening ear, some simple understanding and compassion.

Consideration towards diet and balanced lifestyle—Ayurvedic strategies may help here, but this is beyond the scope of this article.

When a person can acknowledge a condition (problem), understand it, accept it—then they are well on the way to reducing their suffering.

Remember, to get the best benefit one should begin exercising when the condition is only minor to moderate—act early to prevent problems later on. Severe knee arthritis can be very limiting and painful. There is a lot of scope for modified yoga and strength classes to help people prevent progression with their disorder, or at least aid with better management of this growing problem.

This article was previously published in Cikitsa Sangati, the Newsletter of the Australian Association of Yoga Therapists (AAYT).