



Knee Functions & Issues

Description

Function



- The primary function of the knee is to flex and extend the lower leg relative to the thigh.
- The range of motion is determined by each person's particular bones and ligaments. For averages, see [Joint Movements](#).
- Knee joint movement is essential to such everyday activities as walking, running, sitting and standing.
- Unlike other hinge joints, the knee also allows some rotation when flexed.

STRENGTH & ADAPTATION

The knee must be strong, because a great amount of our body weight passes through it. It must also be flexible enough to deal with the adaptations of the ankle and foot, which change shape and position [and] it must adapt to the hip and its role as we walk. When the balance between these

joints and their roles (strength and flexibility) goes awry, the knee often receives the forces. â?? David Keil

Symptoms or Concerns



- Swelling & acute pain
- Chronic pain in knees
- Stiffness in knees after immobility
- Difficulty walking up or down stairs (different causal factors for each)
- Knees that â??snap, crackle, and popâ?• when bent or extended

- Feeling that the knees are buckling
- Knees that tend to hyperextend

Potential Causes



The underlying causes for knee issues include:

- Muscular imbalance
- Mobility issues
- Patello-Femoral Syndrome (PFS)

- Osteoarthritis
- Injury or overuse

Muscular Imbalance

- One cause of knee issues is an imbalanced pull of muscles on the kneecap, causing cartilage to wear down. This can be related to improper tracking of kneecap, knock-knees or being bowlegged. (Doug Keller)
- “Because people with bowlegs tend to bear weight unevenly on their hips, knees and feet (the outer sides of these joints bear more weight), uneven stress and wear on those joints could lead to the early onset of arthritis.” (Nina Zolotow)

POSTURAL IMBALANCE LINKED TO HIP, KNEE AND FOOT SYMPTOMS

All of these problems [bunions, plantar fasciitis, patello-femoral knee syndrome and hip bursitis] can derive from the same postural imbalance,” according to Bill Reif, physical therapist and author of [The Back Pain Secret](#); namely “the exaggerated anterior [forward] tilt of the pelvis, the internal rotation of the thighs, hyperextension of the knees or poor knee tracking, and overpronation of the feet – the inward drop of the ankles and the flattening of the inner arches. This pattern can cause symptoms at the hip, knee, or foot, and often, in more than one of these places.” – Amber Burke

Mobility Issues

- Limited mobility in any hip movements can cause compensation that harms the knee.
- Hypermobility in hips, also, can lead to knee issues. (Marla Apt)
- Knee pain can be caused by instability in the foot, ankle or pelvis. (Ray Long MD)

INSTABILITY IN PELVIS

While instability in the foot or ankle can contribute to knee pain and dysfunction, it’s a less likely culprit than instability in the pelvis—which is where a strong core, hip abductors, and glutes come into play. – Ray Long MD

Patello-Femoral Syndrome (PFS)

- PFS “is caused by femur cartilage rubbing against kneecap cartilage when the knee is bent” and is usually caused by overload or poor knee alignment. (Olga Kabel)
- “This condition can be a precursor to arthritis at the joint and is almost always associated with overuse” Depending on how much cartilage you start off with (this is genetic), what seems like overuse to one person may be different for another.” (David Keil)

Osteoarthritis

- When the cartilage of the knee degenerates and gradually wears away, it is known as osteoarthritis. (Larry Payne MD)

- Risk factors for developing osteoarthritis of the knee include trauma, body weight, sedentary lifestyle, repetitive use, bone abnormalities and some diseases. (Baxter Bell MD)

Injury or Overuse

- Other reasons for knee pain include tears to ligaments, tendons and cartilage (such as a torn meniscus or [patellar tendinitis](#)) due to injury or overuse.

Teaching Considerations





Weâ??ve dividing teaching considerations for knee health and knee issues into three broad categories:

1. For considerations related to teaching for knee health in general, see [Fostering Knee Health](#).
2. When considering the issues of knee **hyperextension, knock knees and bow legs**, the information below can help to optimize knee health and prevent future problems.
3. When a student is experiencing **knee pain** or has had **knee replacement surgery**, please see [Adapting for Knee Pain](#).

The phrase â??locked kneesâ?• may be referring to hyperextension, although more precisely, it refers to an action that relaxes the hamstrings as expert David Coulter PhD explains:

LOCKED KNEES

Most of us are only vaguely aware that we can balance our weight on top of the relaxed thighs, but everyone learns about knees in junior high school cafeteria lines when someone sneaks up behind you and buckles your knee as you are leaning on one leg. Your ensuing collapse shows you clearly that were depending on the locked knee joint to hold you up and that your tormentor caught your relaxed muscles off guard. â?? H. David Coulter

Hyperextension

What is It?

- Hyperextension means that in [extension](#), the knee joint has a greater range of motion than average.
- â??When the knee is straight, instead of the femur bone on top and the shinbones on bottom forming one straight line, your knee joint bows slightly backwards.â?• The kneecaps will likely turn in slightly, making the student look knock-kneed. (Nina Zolotow)

Risks

- Hyperextension may lead to uneven wear on the cartilage of the knee joint.
- It lessens the jointâ??s ability to respond and adapt.

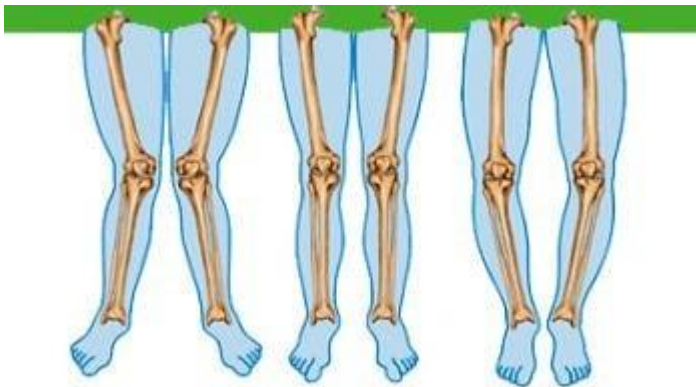
ADAPTABILITY IS WEAKENED

In a hyperextended knee, the natural position of the bones requires less muscular effort. But in this position, the tensegrity or supporting tension surrounding the joint is also gone. Without this support, the adaptability of the knee is weakened. The joint loses its critically important ability to respond to changes and demands from above and below. â?? David Keil

Teaching Considerations

- Nina Zolotow offers a test [here](#) to distinguish hyperextension from knock knees: Stand in Mountain Pose and notice the knees turning inward. Bend knees and shift some weight to balls of feet. Straighten knees by lifting from thighs, keeping some weight in balls of feet. If knees are now facing straight, hyperextension has been corrected. If there is no change, you may have knock knees. But try the adjustment once more just in case.
- Zolotow, as she learned from master teacher Donald Moyer, teaches the same technique as noted in the test for avoiding hyperextension in straight-legged standing poses. See more detail [here](#).

Knock-Knees



- When the knees point more toward the big toes than middle toes, it may be referred to as knock-knees.
- In most cases, a more precise term for knock knees would be a High Q Angle. (Amber Burke)
- As noted below, a clinical diagnosis of genu valgum (appearing as knock knees) could require medical treatment.
- Those with a knock-kneed posture may find alignment and pain relief by separating the feet and/or holding a block lightly between the thighs. (Baxter Bell)

KNOCK-KNEES VS. AN INCREASED Q ANGLE

An obvious migration of the knees toward each other, or genu valgum, is a clinical diagnosis, often arising from severe problems like rickets, and one that may require a treatment beyond the purview of yoga or even physical therapy. What physical therapists would call the mild knock-kneedness that is part of this pattern is more accurately identified as an increased quadriceps angle, or Q angle, which determines the pull on the patella (kneecap). The Q angle is measured from the ASIS (anterior superior iliac spine) to the midpoint of the patella. Amber Burke

KNOCK-KNEES: SEPARATE FEET

Many yoga students are told to bring the inner edges of their feet very close together at the same time they are told to align the kneecaps with their second toes. In those with knock-knees, this can exacerbate the alignment even more. So, separate the feet about hips-distance apart, sometimes



with the aid of a block between the mid-thighs. I suggest they hold the block lightly between their thighs (as they may already have tight adductor muscles and we don't want to encourage more tightness) and imagine that the block is pushing out against the inner thighs. [Has] the student's knee pain disappeared? If it has, I'd recommend they adopt this new stance for future practice. â?? Baxter Bell

Bow Legs

- Genu varum or bow legs refer to cases where a person stands with feet together and the knees are wide apart.
- Nina Zolotow teaches that hyperextended knees and bow legs can be confused. See above (Hyperextension) for a way to differentiate between the two.
- Aligning feet and strengthening inner legs are primary ways to address bow legs. (Nina Zolotow)

BOW LEGS

Because people with bowlegs tend to bear weight unevenly on their hips, knees and feet (the outer sides of these joints bear more weight), uneven stress and wear on those joints could lead to the early onset of arthritis! By working with your alignment in your yoga poses, you can learn to bear your weight more evenly in your *asanas* and, with that new awareness, in your daily life as well. â?? Nina Zolotow

Cautions: Diagnosis & Referral

1. As a reminder, yoga teachersâ??and even yoga therapistsâ??are not trained or licensed to diagnose injury, illness or disorder. You may wish to be very clear about this point, and to ask students if they have obtained a diagnosis.
2. Be prepared to refer students to an expert. Have contact information for qualified experts that you can provide, as needed. See more in [When to Refer Out](#) which includes how to respond to students, and questions for their medical provider.
3. Yoga is likely to be an excellent supplemental resource for students. But of course, teachers must be cautious and clear when responding to studentsâ?? individual needs so that yoga support is not construed as a diagnosis, a â??prescription,â?• or a recommendation for sole treatment.

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