

Ahead of the Pack – A Four-Point Prevention Plan to Avoid Knee Pain From Cycling

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Since Lance Armstrong's string of successes began in the 1990s, bicycling has exploded in popularity in the United States. Road biking, mountain biking, and even spin classes have become mainstream activities, and the number of bicycling enthusiasts today is at an all-time high. The growing packs of cyclists now riding the roads and trails around Albuquerque provide clear evidence that bicycling has become a mainstream sport in New Mexico. In fact, if you look closely, you'll even see a number of cyclists wearing New Mexico Orthopaedics jerseys.

While cycling is a healthy, low-impact activity, it's not risk free. With the recent growth in bicycling popularity, the number of cycling-related injuries has increased. Besides the obvious possibilities of traumatic injuries from falls and crashes, cyclists are also at risk for overuse injuries to the back, wrists, ankles, and, in particular, the knees. The knees are the most common site for overuse injuries because of the repetitive nature of bicycling (a rider can average more than 5,000 pedal strokes per hour).

Most knee injuries from overuse in bicycling result from overtraining, poor bike fit, inadequate conditioning, or anatomic variants. An understanding of these issues can prevent injuries from occurring or can get you back on the bike quickly if you have experienced an injury.

Training

Lance Armstrong did not become a repeat Tour de France champion without years of preparation. As in any sport, cyclists need to increase the intensity and duration of their training gradually, making sure they have the proper base level of fitness before advancing their workouts. While inexperienced cyclists are at a greater risk for injury, even professionals regularly sustain injuries due to overtraining.

Knee injuries in bicycling are most common in the spring, when cyclists dust off their bikes from a winter of neglect and attempt to replicate their performance from the previous year immediately. If you maintain at least a decreased cycling schedule in the winter (even on a trainer or stationary bike) and remain patient with your training early in the season, you will have a much better chance of making it through the entire year pain-free.

In cycling, proper form usually wins out over brute force. Trying to push "big gears," particularly when climbing hills, puts a tremendous amount of stress on the knees and can cause chondromalacia patella (damage to the articular cartilage under the kneecap), patella tendonitis (inflammation of the tendons in that area), and other knee injuries.

Rather than riding in high-resistance gears at low revolutions, riding in easier gears at a higher cadence (80 to 100 rpm) may save you some unwanted knee pain. If you find yourself rocking on the seat when trying to accelerate or to hold a fast pace, you are probably riding in a gear that is too difficult.

Bike Fit

Bicycles come in all shapes and sizes, and so do cyclists. If you unpack your bike from the box and head straight out onto the road without first addressing bike fit, there's a good chance you may start hurting in places you never even knew existed. While improper bike fit often leads to knee pain, it can affect your entire body and lead to neck, back, hip, buttock, and wrist pain, as well.

Professional cyclists continually make small adjustments to their bikes to maximize their performance and compensate for aches and pains. But if you can get a good, one-time bike fit, you can minimize the likelihood of developing knee pain while also improving your abilities on the bike. Getting your bike fit specifically to you is usually a simple process. Many bicycle shops offer bike fitting, and it is worth the small cost you may pay for the service.

Conditioning

Because of the complex biomechanics of the knee, small alterations in the pedaling stroke due to muscle weakness or inflexibility can have a significant impact on the knees of cyclists. With long-term cyclists, it is common to find that the quadriceps, iliotibial (IT) band, and hamstrings lose flexibility. The slight loss of motion around the knee resulting from this muscle tightness can change the forces on the knee and lead to pain almost anywhere in and around it.

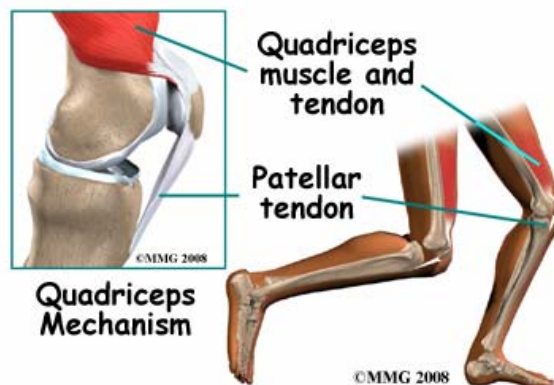
Similarly, even mild weakness in the muscles of the leg and hip, including the quadriceps, hamstrings, gluteals, and calves, can lead to knee pain during cycling. When fatigued from cycling, the muscles are unable to maintain a fluid pedaling stroke, leading to a change in forces around the knee that can result in knee pain.

Spending a couple minutes daily stretching the quadriceps, hamstrings, and IT band is a simple way for you to maintain muscle flexibility. Two 15-minute strengthening sessions per week for the quadriceps, hamstrings, hip abductors, and hip extensors can provide you with the strength to maintain consistent form when pedaling.

Anatomic Variants

Some of the problems you may experience on the bike are out of your control. Whether they are genetic, gender-related, or a result of other injuries, these conditions may require modifications to your bike or bike shoes or necessitate a stretching and strengthening program. In most cases, you may not know you have these conditions, and they may only be diagnosed after evaluation by a medical professional.

Foot pronation (also known as flat feet) can lead to excessive stress on the outside of your knee (and occasionally on the inside). Cycling-specific orthoses can often correct this problem, and angled "shims" under your shoe can also be utilized if you wear cycling shoes. You may also need to modify your stretching and strengthening program if you have flat feet, particularly focusing on IT band and calf stretches.



Genu valgum (knock knees) and genu varum (bowleggedness) can be either genetic or degenerative conditions. With genu valgum, stresses are typically felt on the outside of the knee, while with genu varum, stresses are usually felt on the inside of the knee.

However, with the biomechanical alterations resulting from these conditions, pain can occur just about anywhere in your knee. Both of these conditions can be addressed with cycling orthoses, shims, or changes in your pedals. You may also need to modify your stretching and strengthening program to manage these conditions.

Women typically have an increased “Q-angle” at their knees, meaning that because women have wider pelvises, the likelihood of having genu valgum is increased. Pain similar to that experienced with genu valgum is common. Modifications like those for genu valgum can be used, but additional strengthening for the hips and stretching of the IT band may be of particular benefit.

Leg length differences are not unusual and can be part of normal differences in bone growth or a result of trauma. Pain resulting from leg length differences can occur, but usually only in one knee. Shims and shoe lifts are often used to correct for this difference if it is significant.

Treating an Injury

So where do you start if you have a knee injury from overuse? First, you should rest and ice the knee immediately after the onset of the injury. If the pain does not subside with rest and ice, you may need to see a medical professional.

Once the pain has subsided, you can start back slowly using low-resistance, high-revolution cycling. You should increase your training gradually as pain permits, and you should expect about one week of training for every week of training missed before you are back to your previous level. The bicycle adjustments and exercises described here can also be incorporated at the same time.

Who would have thought that something as simple as riding your bike could be so complicated? Take these suggestions into consideration, consult a more experienced professional if necessary, and then go out and enjoy the ride. Remember to wear sunscreen and a helmet, though!

