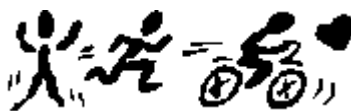


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KNEE PAIN AND BICYCLING

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INTRODUCTION

Knee pain is one of the most common complaints among cyclists with the majority of cases caused by overuse due to the repetitive nature of the sport. During 1 hour of cycling, a rider may average over 5,000 pedal revolutions. Multiply that by a 3-4 hour ride and you can see how the smallest misalignment, whether anatomic or equipment related, repeated over 20,000 times may lead to an injury. In one recreational long-distance bicycling tour, 65% of all riders reported knee pain (Dannenber AL: Predictor of injury among 1638 riders in Cycle Across Maryland. Am J Sports Med 1996;24(6);747-753). Causes of knee pain in cycling may include improper bike fit and/or training distance and intensity, anatomical factors such as leg length discrepancy, muscle imbalance such as strong quads and weak hamstrings and inflexibility such as tight hamstrings. Determining the cause of the problem and correcting it is paramount in preventing further pain.

ANATOMICAL CAUSES OF KNEE PAIN

A leg length discrepancy may lead to IT band problems and lateral knee pain on the shorter leg and/or posterior knee pain. Overpronation at the foot may lead to medial knee pain. Muscle weakness of the quads, glutes, hamstrings, or hip flexors lead to alterations in pedaling technique and efficiency which stresses other parts of the body to make up for the weakness and leads to overuse injuries. For example, a weak quadriceps muscle may lead to anterior knee pain secondary to poor tracking of the patella with each pedal revolution. Lastly, inflexibility may lead to knee pain. An example would be tightness in the IT band causing lateral knee pain.

IMPROPER BIKE FIT CAUSES OF KNEE PAIN

A saddle that is too high will cause excessive knee extension and rocking of the hips which stresses the hamstrings (causing posterior knee pain) and IT band (causing lateral knee pain). A saddle that is too low stresses the quadriceps tendon and patella, causing anterior knee pain. A saddle that is too far forward leads to a hyperflexed position and stresses the anterior knee joint, causing anterior knee pain. A saddle that is too far back causes stress to the hamstrings and IT band from excessive forward reach for the pedal and leads to posterior and lateral knee pain. Crank arms that are too long lead to increased forces on the entire knee and anterior knee pain. Internally rotated cleats lead to tibial rotation stress on the anterior knee while externally rotated cleats lead to medial knee pain.

TRAINING ERRORS LEADING TO KNEE PAIN

Rapid increase in training distance or intensity may lead to muscle tightness and microtrauma. Without proper recovery, microtrauma stimulates an inflammatory response that leads to the damage of local tissue. With cumulative microtrauma as seen in overtraining, degenerative changes begin to occur that lead to weakness, loss of flexibility and chronic pain. Excessive hill work or pushing large gears may also lead to cartilaginous breakdown and knee joint pain.

TREATMENT CONSIDERATIONS

Initial management of knee pain includes rest, ice, compression, elevation, and medication to help control inflammation and allow the tissue to heal. Correcting the cause of the pain is the next step in the rehabilitation process. This may include the assistance of a qualified bike fit specialist to correct improper bike fit leading to knee pain and/or a medical professional to do a detailed biomechanical analysis and screening of strength and flexibility to determine the appropriate plan of care.

SUMMARY

Knee pain is the most common overuse problem in cyclists but is very preventable. When evaluating knee pain and cycling related overuse injuries, important considerations include bicycle fit, training distance and intensity, and anatomical factors such as muscle imbalance and inflexibility. Riding with knee pain shouldn't be a daily occurrence. Seek professional guidance if need to get to the root of the problem and get back to pain free riding!