

Cycling Injuries

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Knee Problems in Cyclists

I see a lot of cyclists with various injuries, and knee problems are one of the more common complaints. They are an interesting group of athletes to assess, because there are so many biomechanical factors, both biological and within their bike set-up, that may contribute to the problem. Because of the many variables involved, I often like to perform a full screening assessment, which involves on & off-bike measurements, inspection of the bike, & video-analysis of front, back & side riding posture.

Off-bike assessment:

Some of the things I look at include their general posture, including spinal & pelvic symmetry, sagittal & coronal plane knee alignment, flexibility through the spine, hips, knees & ankles, simulated bike & general sitting posture, muscle definition, and leg length. Measurements specific to the bike include the 'in seam' measure (floor to inferior pubic symphysis), & sometimes the trochanteric height.

On-bike:

Their bike is mounted to a wind-trainer, and I look at their 'top dead-centre' & 'bottom dead-centre' knee angles, the position of their knee & foot relative to the crank & pedal axis respectively, their foot alignment and 'play' on the pedals (they generally use clips or cleats to 'fix' their feet to the pedals), & their trunk alignment.

The bike is measured for:

Crank axis to top of seat height, crank length (these two measurements together give the seat height measure), seat inclination & fore / aft position.

On the video I look for:

Any unwanted knee motion (generally too much adduction & / or internal rotation), foot alignment, hip & knee angles, lower back posture, trunk & neck angles and posture, amount of side-to-side pelvic motion & whether it is symmetrical. Problems at either end, neck or foot, and anywhere in-between can affect the whole chain & certainly the knee.

Here are two of the more common knee problems in cyclists, and examples of what specific factors may need to be considered.

Patello-femoral dysfunction: pain may arise from the joint or its surrounding soft-tissues, & is generally due to excessive extensor torque across the knee. This may be due to excessive hill riding or using too many high gears, having a seat that is

too low thus producing excessive knee flexion & greater patellar compression & shearing forces, or poor lower limb alignment causing abnormal tracking. Foot problems, such as rearfoot pronation or forefoot varus, may also contribute by affecting lower limb alignment. Treatment may consist of correcting any relevant biomechanical irregularities or bike set-up problems, patellar taping, and possibly a rehab programme to correct hip and knee muscle function.

Iliotibial band syndrome: the ITB may be compressed across the greater trochanter, causing hip pain, or at the lateral epicondyle of the knee, causing typical lateral ITB syndrome. Causes may be a sudden increase in riding load, a 'narrow stance' or too much 'toe in' of the foot on the pedal, insufficient 'float' (side to side rear-foot motion), seat too high or too far back, posture too aerodynamic, excess subtalar pronation or genu varus, tight gluteus maximus or tensor fascia lata, poor lateral hip control / too much knee adduction or internal rotation. Treatment may include the necessary adjustments to bike set-up, soft-tissue techniques to the ITB, hip & vastus lateralis, stretches for ITB & gluteus maximus, & use of foot orthoses.

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