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Cycling for Knee Rehabilitation

Cycling is used as an integral part of knee rehabilitation programs by physio's around the world. This is not surprising when you consider the benefits, including:

- increase or restore knee joint range of movement
- increase or restore knee joint stability
- increase or restore the strength of muscles around the knee
- decrease or eliminate pain
- prevent reoccurrence of the injury

In comparison with other exercises cycling is a relatively *'knee friendly'* activity that can help to improve knee joint mobility and stability.

Cycling is frequently used as a rehabilitation exercise modality after knee injury or surgery as well as part of the management of chronic degenerative conditions such as osteoarthritis.

The bicycle has a number of features that make it a particularly good tool for knee rehabilitation:

- Non weight-bearing
- Low impact
- Uses a range of motion that is needed for most activities of daily living
- Controlled movement
- Variable resistance
- Stable position
- Cyclic movement nourishes joint cartilage
- Closed kinetic chain exercise (see this article)
- Cardiovascular (aerobic) exercise activity

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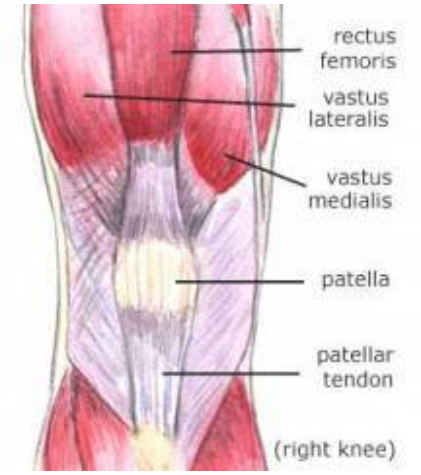

All of the major muscles of the legs are used at one point of another during cycling but the major muscles that are used for generating power are the quadriceps group, especially the quadriceps muscle rectus femoris (see diagram).

During the pedal cycle the quadriceps mainly work as you push the pedal down and straighten your leg whilst the hamstrings at the back of thigh work to bend the knee.

The amount the hamstrings work varies - if you are using pedals where your feet go under a strap your hamstrings work more as you can use them to pull the pedal up using the strap. By using cycling within the rehabilitation program the quadriceps can be strengthened whilst controlling the amount of stresses to the knee.

Knees like cyclical movement without excessive forces as that is the way that the articular cartilage covering the ends of your bones gets nourished. Cycling has been shown to be a relatively safe activity for rehabilitation after anterior cruciate ligament (ACL) reconstruction as the strain that is placed on the ACL during cycling at rehabilitation levels is relatively low (Refs 4 & 5).

With the bike correctly set up during one complete turn of the pedal your knee travels from 30 to approximately 110 degrees of flexion. This can be seen in Figure 1. Before you can start to include stationary cycling in your knee rehabilitation you should have a minimum of 100 degrees of knee flexion so that you can complete one full turn of the pedals.

This article has been supplied by Sean Campbell a Spinal Rehabilitation physiotherapist at Sports & Spinal Physio Centres. Sean is a keen cyclist on the coast and has a strong interest in managing cycling injuries.