Bike Fit

Setting up your bike to reduce injuries and increase performance.

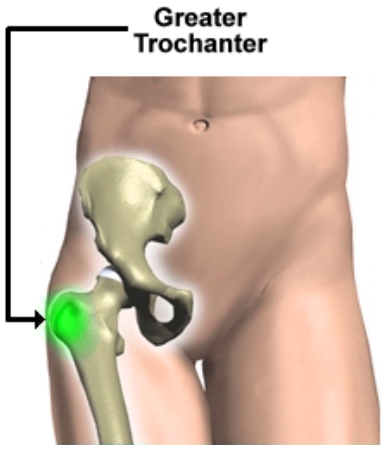
There are many things to think about when setting up a bike. The type of bike and the terrain ridden, the cyclist's preferred posture on the bike, any biomechanical limitations of the cyclist as well as how many kilometres are ridden each week and how important aerodynamics is to the cyclist, are all things that need to be factored in.

A detailed musculoskeletal screening to assess spinal/neural mobility, hip and lower limb mobility, muscular strength, control and stability should be done before adjusting the bike. All this information is important to set up each cyclist on the bike.

Seat Height:

At the bottom of the pedal stroke, your knee should be flexed to approximately 10 degrees. To achieve this, the ideal bike seat height is calculated by the following equation:

Ideal Seat Height = 0.98 x (lower limb leg length + cleat thickness).



Lower Limb Leg Length is measured from the top of the Greater Trochanter (big bony point on the outside of the hip) to the floor. It is measured vertically with a tape measure, with the feet pedal width apart, weight equally on each foot and without shoes. If the cyclist has different leg lengths, the shorter leg length is used.

E: admin@ibphysio.com.au | T: 02 9976 3540 | F: 02 9976 3290 | Suite 14, Level 2, 22 Darley Road, Manly, NSW 2095 Australia

Cleat Thickness should be measured with a tape measure and added to the leg length measurement. If the leg length were to be measured with shoes on, then standing on the cleats would prevent the cyclist from standing in a neutral ankle position resulting in an incorrect leg length measurement.

If the cyclist uses mountain bike type shoes with a recessed cleat in the sole of shoe that allows the cyclist to stand with a neutral ankle stance, then then a combined lower leg length and cleat thickness can be measured with the shoes on.

The above equation will give an "ideal" seat height from the centre/top of the saddle to the centre of the pedal axle when the crank arm is positioned in line with the seat tube. This measurement is only used if the cyclist has good spinal, hip flexion, hamstring, neural and upper limb mobility and good cycle specific strength and stability. If there is a history of injury, it is very important the cycle specific musculoskeletal findings are factored into the set up.

Cyclists with the original bike seat height set well below the ideal will often present with hip restriction, ITB or knee pain. If the cyclist is used to a lower seat height, it is better to not raise the seat above 0.96 x (lower limb leg length + cleat thickness) initially. This will allow the cyclist to gradually get used to changing the seat height.

Cyclists with the original bike seat height set well above the ideal will often present with back or sciatic nerve pain. There will be excessive side-to-side movement on the seat and being in an overstretched position can sometimes cause neck and upper body neural symptoms. It can take several weeks for the body to adjust to dropping the seat as the body gets used to the new joint angles and muscles lengths involved. The cyclist will often feel a loss of power initially.

Forward/Backwards seat position: Once the seat height for the cyclist has been decided, the forward/backward position should be checked. The seat forward/backward position should be set so that when both cranks are positioned in the horizontal position, dropping a plumb bob or pointing a laser vertically down from the bottom point of the kneecap on the front leg, will fall within the centre of the pedal axle. This will minimise forces at the knee and the reach to the handlebars (handlebars can also be moved up/down, shorter/longer handlebar stem).

Handlebar position: Handlebar height and reach can be moved up or down or made, shorter or longer. This may require changing parts to do so. Handle bars also come in different widths and with different bends. The decision on the handlebar position and type comes down to a balance of comfort, control and aerodynamic performance and these will be affected by any biomechanical limitations. An upright position on the bike with a tall handle bar and short reach will be more comfortable with more control but aerodynamics will suffer. This will be more suitable for mountain bikes. A more stretched out position with the handle bars lower and further forward will improve aerodynamic performance, more suited to the higher speeds of road bikes, but there will be a decrease in control and the cyclist needs to have good flexibility, strength and motor control to avoid hip, back and neck pain and injuries. Wider handlebars will increase control, while narrow bars will improve aerodynamics.

Article by Philip Ting

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