

Tips for Proper Bike Fit

For the estimated 85 million weekend bicycle enthusiasts and competitive riders in the U. S., the risk of a bicycle-related injury may increase with an ill-fitting bicycle, according to the American Physical Therapy Association (APTA).

The most common bike fit errors include saddle heights that are either too high or too low, handlebar reach that is either too long or too short, and misalignments of the pedal and shoe. Cyclists should consider the following to ensure that they have proper bike fit:

Saddle. Be sure that the saddle is level. If you are sliding too far forward from a forward-tilting saddle, too much weight is being placed on your hands, arms, and lower back. If the seat is tilted backwards, you may place undue strain on your lower back and possibly experience saddle-related pain. A physical therapist can measure proper saddle height by measuring knee angle at the most extended position of the knee in common pedaling.

The saddle also should be a comfortable distance from the handlebars. If it is too close, extra weight will be placed on the mid-back and arms; too far away and extra strain may be placed on the lower back and neck.

Handlebars. Handlebar position will affect hand, shoulder, neck, and back comfort. The higher the handlebars, the more weight will be placed on the saddle. Generally, taller riders should have lower handlebars in relation to the height of the saddle. Proper handlebar position allows for shoulders to roughly make a 90 degree angle between the upper arm and trunk. Trunk angle for the road bike cyclist is 25-35 degrees and for comfort/recreational riding is 35-90 degrees. Moen notes that riders should re-examine their bicycle fit after bad falls or crashes, due to possible re-orientation of handlebars, brakehoods, cleats, or the saddle.

Knee to Pedal. A physical therapist also can measure the angle of the knee to the pedal. The closer the angle is to 35 degrees, the better function the cyclist will have and with less stress on the knee. For the road cyclist, the angle should be 30-35 degrees. The recreational cyclist should have a 35-45 degree angle.

Foot to Pedal. The ball of the foot should be positioned over the pedal spindle for the best leverage, comfort, and efficiency. A stiff-soled shoe is best for comfort and performance. Pedaling is a skilled activity that requires aerobic conditioning, you should make it your goal to work toward pedaling at 80-90 revolutions per minute (advanced at 90-105 rpm). Pedaling at this rate will lessen your chance of injury.

Tips for Avoiding Bike-Fit Related Injuries

Postural Tips

- Change hand position on the handlebars frequently for upper body comfort.
- Keep a controlled but relaxed grip of the handlebars.
- When pedaling, your knee should be slightly bent at the bottom of the pedal stroke. Avoid rocking your hips while pedaling.

Common Bicycling Pains

- **Anterior (Front) Knee Pain.** Possible causes are having a saddle that is too low, pedaling at a low cadence (speed), using your quadriceps muscles too much in pedaling, misaligned bicycle cleat for those who use clipless pedals, and muscle imbalance in your legs (strong quadriceps and weak hamstrings).
- **Neck Pain.** Possible causes include poor handlebar or saddle position. A poorly placed handlebar might be too low, at too great a reach, or at too short a reach. A saddle with excessive downward tilt can be a source of neck pain.
- **Lower Back Pain.** Possible causes include inflexible hamstrings, low cadence, using your quadriceps muscles too much in pedaling, poor back strength, and too-long or too-low handlebars.
- **Hamstring Tendinitis.** Possible causes are inflexible hamstrings, high saddle, misaligned bicycle cleat, and poor hamstring strength.
- **Hand Numbness or Pain.** Possible causes are short-reach handlebars, poorly placed brake levers, and a downward tilt of the saddle.
- **Foot Numbness or Pain.** Possible causes are using quadriceps muscles too much in pedaling, low cadence, faulty foot mechanics, and misaligned bicycle cleat for those who use clipless pedals.
- **Ilio-Tibial Band Tendinitis.** Possible causes are too-high saddle, leg length difference, and misaligned bicycle cleat for those who use clipless pedals.