

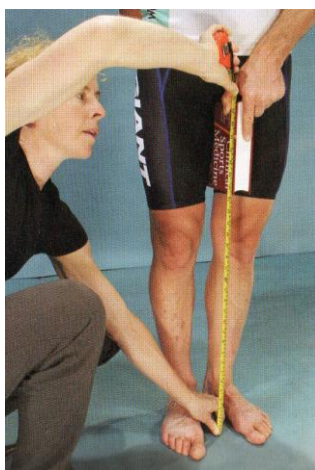


The Sports & Fitness Clinic

Optimal Saddle Height on Road Bikes for Injury Prevention & Improved Performance

- The methods for determining optimal saddle height are varied and not well established, and have been based on various relationships including saddle height and lower limb length, length from groin to floor and a reference range of knee joint flexion;
- Increasing saddle height can cause increased shortening of the vastii muscle group (outer quads of the frontal thighs), but no change in hamstring (rear thigh muscle) length;
- The length and velocity of contraction in the soleus muscle of the calf seems to be more affected by saddle height than in the gastrocnemius (the other main calf muscle);
- The majority of evidence suggests that a small (5%) change in saddle height can affect knee joint kinematics and moments by a large amount (35% by 16% respectively);
- The compressive forces around and under the kneecap (patellofemoral) seem to be inversely related to saddle height (ie increased by lower saddle height and vice-versa) but the effects on other forces between the lower leg and thigh are uncertain.
- The researchers concluded that: "On the basis of the conflicting evidence on the effects of saddle height changes on performance and lower limb injury risk in cycling, the saddle height that best minimises the risk of knee injuries and increases cycling performance is one that results in a knee flexion angle of 25-30° when the leg is maximally extended" (ie at the bottom of the pedal stroke). Given that 50% of cyclists can expect to experience some knee joint pain as a result of overuse at some time in their cycling career, this '25-30°' rule might be a good starting point when setting up saddle height for maximum performance and injury-free riding!

Sports Med. 2011 Jun 1;41 (6):463-76 (Peak Performance 301)



A popular method of determining the optimum seat height is the Le Mond method (first described by legendary American cyclist Greg Le Mond).

Take the in-seam measurement (i.e. from floor to groin) then multiply this figure by 0.88.



This should be the distance from the centre of the sprocket to the top of the saddle.

Variations will depend on;

1. Preference
2. Crank length
3. Cleat position
4. Shoe thickness
5. Seat type
6. Seat for / aft position



A useful measure of seat for / aft position is the plumb line method.

With the cyclist seated, feet on the pedals and the pedals level, a plumb line is dropped from the tibial tuberosity and should land through the axis of the pedal or just behind it.