

# Setting the Seat for Better Bicycling: A Systematic Review

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## Background

Cycling is a popular sport globally with a high prevalence of overuse-type injuries. Literature suggests that improper bicycle fit or design might be implicated in joint pain, perineal numbness, and sexual dysfunction injuries.

## Purpose

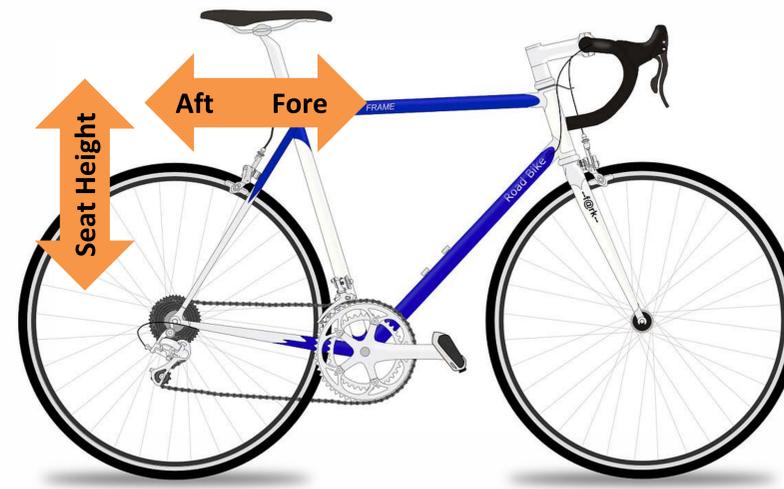
To inform clinicians on the most current literature about **bicycle seat position and design and optimal bicycle seat adjustments to reduce injury risk and discomfort** among cyclists.

## Methods

- Systematic review: PubMed, EMbase, and SPORTDiscus
- Inclusion criteria: exposure variable seat height, position, or design; subjects 18 years or older; published after 1991; English language; full manuscript
- Exclusion criteria: significant or chronic disabilities; traumatic; mountain- or triathlon-style; performance related; erectile dysfunction

## Analysis

- The Downs and Black Quality Assessment tool was used to assess risk of bias
- All studies scored between 13-17 points out of 28 points on the Downs and Black Quality Assessment Tool, placing them in moderate quality category



[https://www.aliexpress.com/store/product/2013-New-RUBAR-Emir-Road-MTB-Bike-Bicycle-Seat-Saddle-Black-Green-Free-Shipping/523645\\_1119079640.html](https://www.aliexpress.com/store/product/2013-New-RUBAR-Emir-Road-MTB-Bike-Bicycle-Seat-Saddle-Black-Green-Free-Shipping/523645_1119079640.html)

## Results

### Seat Cutout

- Complete seat cutout had lower anterior seat pressure & least feeling of stability
- Standard seat had lower posterior seat pressure
- Partial seat cutout ranked most comfortable by the majority of subjects (55%)

### Nose Length

- Shorter nose lengths led to an increase in torso anterior tilt, increase in perineal comfort, decrease in ischial tuberosity comfort, and perception of less stability
- Traditional seats had significantly higher average and peak perineal pressure as compared to no-nose seats

## Results (continued)

### Seat Fore-Aft

- Aft seat position resulted in more pain
- Forward seat position reduced tibiofemoral anterior shear force and increased knee flexion angle

### Seat Height

- Increased seat height: increased ankle and decreased knee contribution; significantly increased overall pain; provoked higher fatigue and pain in the anterior thigh and knee
- Standard seat height was significantly more comfortable

## Conclusions & Clinical Relevance

This work will allow clinicians to gain a more comprehensive understanding of common adjustments to bicycle seat position and design that can reduce pain and injury.

Emerging findings from our review include:

- Seat height can be adjusted within a fairly large range without affecting forces at the knee joint
- Shorter saddle nose lengths may result in less pain and perineal pressure but may also be less stable
- An aft seat position may result in higher pain ratings and greater knee joint kinematics

## Acknowledgements

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