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

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

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
We would like to acknowledge Leila Ledbetter, MLIS, for her assistance in conducting the database search.