

WORKPLACE SOLUTIONS

From the National Institute for Occupational Safety and Health

No-nose Saddles for Preventing Genital Numbness and Sexual Dysfunction in Occupational Bicycling

Summary

Workers who ride a bicycle as part of their job may be at risk for genital numbness or more serious sexual and/or reproductive health problems from pressure in the groin (perineum) from the traditional bicycle saddle. NIOSH has conducted studies that have demonstrated the effectiveness of no-nose bicycle saddles in reducing pressure in the groin and improving the sexual health of male bicycle patrol police officers. While most workers in jobs that involve bicycling are men, recent evidence suggests that no-nose bicycle saddles may also benefit women.

Description of Exposure

About 50,000 workers in public safety occupations ride bicycles as part of their job. They include police officers, emergency medical technicians (EMTs), and security staff who patrol by bicycle. These workers have reported groin/genital numbness and more severe sexual problems related

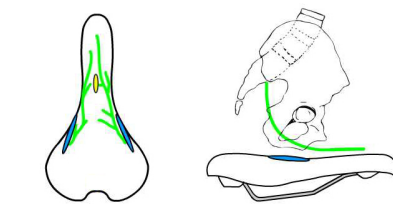


Figure 1. Nerves and arteries for the genitals (shown in green) compressed under the traditional saddle nose. The blue region represents the contact areas on the sit bones. The yellow region represents the pubic bone. The pelvis is shown in the side view.

to prolonged use of a bicycle saddle in their work [NIOSH 2000]. In a study conducted by Schrader et al. [2002], police bicycle patrol officers reported spending an average of about 25 hours per week sitting on a bicycle saddle. Many of them also ride a bicycle for recreation while off duty, so they spend more than 25 hours per week on a bicycle saddle.

The traditional bicycle saddle has a narrow nose or horn that protrudes under the groin as the cyclist straddles the bicycle. Ideally, the weight

of the cyclist supported on the saddle should be under the pelvic sit bones. However, part of the weight is supported where the groin contacts the saddle nose. Bearing weight on this region of the saddle compresses the nerves and arteries in the groin (see Figures 1 and 2). These nerves and arteries run through the groin between the sit bones to the genitals. Pressure on these nerves and arteries over time may lead to a loss of sensation and a decrease in blood supply



Figure 2. Example of pressure measured on a traditional saddle with a protruding nose. The white box shows the groin region. The blue color is the lowest pressure, followed by green, yellow, orange, and red (highest pressure). This saddle has a cut-out hole as shown by the thinner dark outline of the saddle.

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to the genitals. This can contribute to the sexual and reproductive health effects that have been reported with bicycling.

NIOSH Studies

NIOSH studies [2000, Schrader et al. 2002] showed that male bicycle patrol security officers who complained of groin numbness had night erections that lasted less time than those of a similar group of non-bicycling men. Other NIOSH studies [Lowe et al. 2004; Schrader et al. 2008] showed that pressure on traditional (nosed) bicycle saddles in the area under the bicyclist's groin may be as high as 5.37 pounds per square inch (37 kPa) and are typically 2.90 pounds per square inch (20 kPa) during bicycling. This level of pressure is affected by the weight and body shape of the cyclist, the shape and cushioning of the saddle, and the amount of forward body tilt of the cyclist. (As a point of reference, the pressure on an arm blood pressure cuff needed to restrict blood flow in the arteries is about 120 mm Hg, which is equal to 2.32 pounds per square inch [16 kPa].)

Fewer studies of the effects of bicycle saddle use on female cyclists have been conducted. However, recent evidence suggests that women cyclists may also be at risk for a decrease in sensation of their genitals from use of a traditional nosed bicycle saddle [Guess et al. 2006].

Reducing Pressure in the Groin from the Bicycle Saddle

The no-nose bicycle saddle

A number of manufacturers have designed bicycle saddles to support the weight of the cyclist on their sit bones without a narrow nose of the saddle protruding forward under the groin region. A no-nose bicycle saddle is designed so that the portion of the nerves and arteries for the genitals that are forward of the sit bones are not compressed under any part of the saddle surface (see Figure 3). A no-nose bicycle saddle should have no saddle material protruding between the thighs of the cyclist to create pressure in the groin.

NIOSH studies of no-nose saddles

A study by NIOSH [Lowe et al. 2004] showed that saddles without the protruding nose greatly reduced pressure in the groin that compresses the nerves and arteries for the genitals. In a more recent NIOSH study [Schrader et al. 2008], more than 90% of officers on

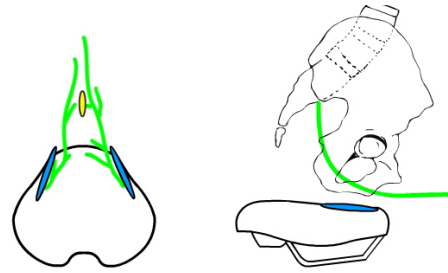


Figure 3. Removal of the protruding saddle nose reduces pressure under the nerves and arteries for the genitals. See Figure 1 for further description.

bicycle patrol who tried a no-nose saddle were still using the saddle after 6 months. These officers believed that no-nose bicycle saddles could be used safely and effectively in their work. Several of these officers said that it took some time to get used to the no-nose saddle because it has a different feel than a traditional saddle. In the 2008 NIOSH study, the no-nose saddles were associated with pressure in the groin region of 1.02 pounds per square inch (7 kPa). In a typical pressure picture for a no-nose saddle, there is very little pressure forward of the sit bones (see Figure 4). The pressure on the nerves and arteries for the genitals may be even lower than 1.02 pounds per square inch because some of the measured pressure was caused by the back of the thighs making contact with the rounded-off front of the no-nose saddle. The study showed that the no-nose saddle reduced pressure in the groin by at least 65% (see Figure 5).

Recommendations

Contrary to some cyclists' belief, it is *not* normal for any part of your body to go numb or lose feeling. Numbness

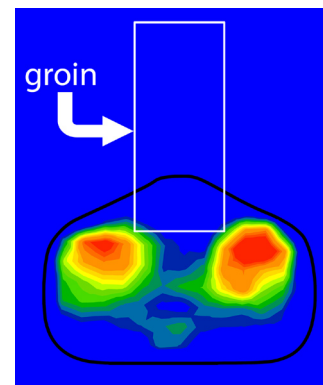


Figure 4. Example of pressure measured on a no-nose saddle. In this example there is almost no pressure in the groin region.

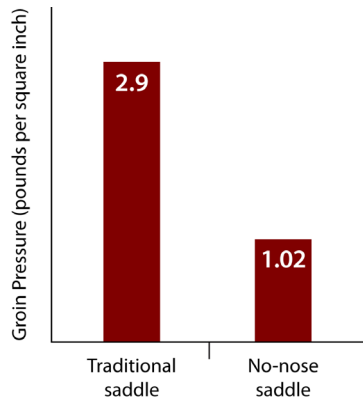


Figure 5. Comparison of groin pressure for a traditional and no-nose saddle.

in the groin or genitals is a warning sign that should not be ignored. Workers who ride a bicycle as part of their job* can take the following steps to help prevent sexual and reproductive health problems:

- Use a no-nose saddle for workplace bicycling. Adjust the no-nose saddle according to the manufacturer's instructions. Give yourself time to get used to riding with a no-nose saddle. At first, it may seem very different from the saddle you have used in the past. (A list of no-nose bicycle saddle manufacturers can be found at www.healthycycling.org.)
- Seek guidance on proper bicycle fit from a trained bicycle fit specialist.
- Get off the bicycle when at a standstill. Do not lean against a post or other object to stay seated on the bicycle saddle when you are not riding.
- Get off the bicycle if you begin to have numbness, tingling, or loss of feeling in any part of your body.

*NIOSH has not studied competitive cycling and can not make recommendations for the relatively small number of workers who ride a bicycle competitively in their occupation.

Acknowledgments

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References

- Guess MK, Connell KA, Schrader SM, Reutman SR, Wang A, Lacombe JA, Toennis C, Lowe BD, Melman A, Mikhail MS [2006]. Genital sensation and sexual function in female bicyclists and runners: Are your feet safer than your seat? *J Sexual Med* 3(6):1018–1027.
- International Police Mountain Bike Association [2008]. *The complete guide to public safety cycling*. 2nd ed. Sudbury, MA: Jones and Bartlett Publishers.
- Lowe BD, Schrader SM, Breitenstein MJ [2004]. Effect of bicycle saddle designs on the pressure to the perineum of the bicyclist. *Med Sci Sports Exerc* 36(6):1055–1062.
- NIOSH [2000]. *Health Hazard Evaluation Report: City of Long Beach Police Department, Long Beach, CA*. By Schrader SM, Breitenstein MJ, Lowe BD. Cincinnati, OH: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, HETA 2000–0305–2848.
- Schrader SM, Breitenstein MJ, Clark JC, Lowe BD, Turner TW [2002]. Nocturnal penile tumescence and rigidity testing of bicycling patrol officers. *J Androl* 23(6):927–934.
- Schrader SM, Breitenstein MJ, Lowe BD [2008]. Cutting off the nose to save the penis. *J Sexual Med* 5:1932–1940.

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For More Information

More information about bicycle saddles and reproductive health can be found at the following Web site: <http://www.cdc.gov/niosh/topics/bike/>.

The reproductive health topic page can be found at the following Web site: <http://www.cdc.gov/niosh/topics/repro/>.

A video demonstration of saddle pressure on no-nose saddles can be found at the following Web site: http://video.cdc.gov/rangen/niosh-video/saddle_pressure.rm.

More information about where to find no-nose bicycle saddles can be found at the following Web site: <http://www.healthycycling.org>

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