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Journal of Manipulative and Physiological Therapeutics

Volume 23, Issue 1, January 2000, Pages 37-47

Review of the Literature

Sitting biomechanics, Part II: Optimal car driver's seat and optimal driver's spinal model *

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[https://doi.org/10.1016/S0161-4754\(00\)90112-X](https://doi.org/10.1016/S0161-4754(00)90112-X)

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Abstract

Background: Driving has been associated with signs and symptoms caused by vibrations. Sitting causes the pelvis to rotate backwards and the lumbar lordosis to reduce. Lumbar support and armrests reduce disc pressure and electromyographically recorded values. However, the ideal driver's seat and an optimal seated spinal model have not been described. **Objective:** To determine an optimal automobile seat and an ideal spinal model of a driver. **Data Sources:** Information was obtained from peer-reviewed scientific journals and texts, automotive engineering reports, and the National Library of Medicine. **Conclusion:** Driving predisposes vehicle operators to low-back pain and degeneration. The optimal seat would have an adjustable seat back incline of 100 from horizontal, a changeable depth of seat back to front edge of seat bottom,

adjustable height, an adjustable seat bottom incline, firm (dense) foam in the seat bottom cushion, horizontally and vertically adjustable lumbar support, adjustable bilateral arm rests, adjustable head restraint with lordosis pad, seat shock absorbers to dampen frequencies in the 1 to 20 Hz range, and linear front-back travel of the seat enabling drivers of all sizes to reach the pedals. The lumbar support should be pulsating in depth to reduce static load. The seat back should be damped to reduce rebounding of the torso in rear-end impacts. The optimal driver's spinal model would be the average Harrison model in a 10 posterior inclining seat back angle. (J Manipulative Physiol Ther 2000;23:37-47)



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Keywords

Sitting; Biomechanics; Lordosis; Ergonomics; Spinal Model; Motor Vehicles; Whiplash Injury; Chiropractic

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