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# A Review of Computer Simulation of Spine Biomechanics for the Treatment of Scoliosis

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***Abstract***

This paper reviews the biomechanical computer models of spine and scoliosis and their roles in provision of predictive information for surgeons and clinicians. The review examines the modeling schemes, multi-body modeling (MBM) and finite element modeling (FEM), utilized for spine modeling, models of the spine components and the validation processes. It reveals that the available models help clinicians have a priori choice of correction techniques and demonstrate to patients the expected degree of correction. Advantageously, the models can enhance understanding of the spine by simulating its behavior in different conditions and situations, and provide information that cannot be easily obtained through in vivo and in vitro experimental studies. Mostly, FEM has been employed in scoliotic spine modeling, while MBM has been seldom used despite having many advantages over FEM. The models are generally developed and validated through modifying the parameters and matching the model behavior with experimental kinematic data.

***Keywords****:* scoliosis, scoliotic spine, multi-body modeling, finite element modeling.