

Preventive Biomechanics

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How can we optimize a bedridden patients mattress? How can we make a passenger seat on a long distance flight or ride more comfortable? What qualities should a runners shoes have? To objectively address such questions using engineering and scientific methods, adequate virtual human body models for use in computer simulation of loading scenarios are required. The authors have developed a novel method incorporating subject studies, magnetic resonance imaging, 3D-CAD-reconstruction, continuum mechanics, material theory and the finite element method. The focus is laid upon the mechanical in vivo-characterization of human soft tissue, which is indispensable for simulating its mechanical interaction with, for example, medical bedding or automotive and airplane seating systems. Using the examples of arbitrary body support systems, the presented approach provides visual insight into simulated internal mechanical body tissue stress and strain, with the goal of biomechanical optimization of body support systems. This book is intended for engineers, manufacturers and physicians and also provides students with guidance in solving problems related to support system optimization. EAN/ISBN : 9783642290039
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