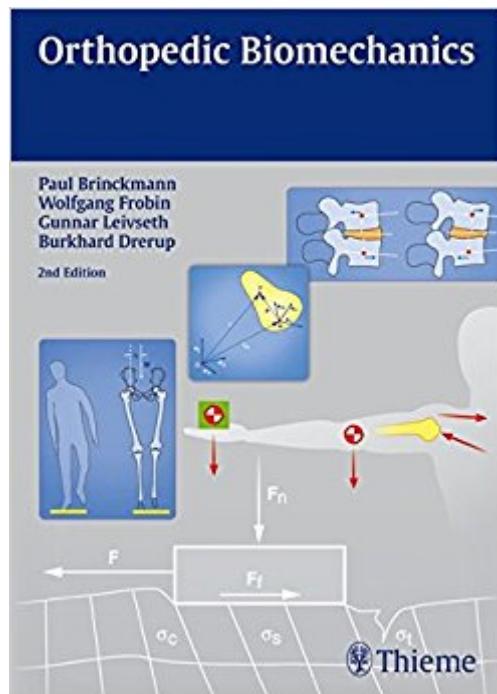


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# Orthopedic Biomechanics



## Synopsis

FOUR STARS from Doody's Star Ratings. This is an outstanding publication in its analysis of techniques for changing the effects on the skeleton through therapy, training, braces, behavior modification, and ergonomic adaptations....It is well written technically and readily comprehensible. -- Doody's Book Review (Score: 94) This book will make it possible to understand the structure and the function of the human locomotor apparatus, to understand the factors of wear, to try to prevent them, and then to correct them. -- European Journal of Orthopaedic Surgery & Traumatology

The expanded and fully updated second edition of Orthopedic Biomechanics explains the effects of mechanical influences on the musculoskeletal system and highlights the importance of biomechanical knowledge in the prevention, treatment, and rehabilitation of orthopedic injuries and disorders. Clear and concise discussion of the forces acting on bones, tendons, and ligaments facilitates a solid understanding of current and past research, complex concepts, and technical information in orthopedic biomechanics. Readers will also find practical guidance for applying their knowledge to solving actual clinical problems.

The book begins by summarizing the basic principles of biomechanics and mathematical theory, including biomaterials science, vector algebra, and movement in two and three dimensions. It then moves on to the mechanical properties of musculoskeletal tissues, with chapters devoted to muscle and muscle function; the modeling of joint loads; gait analysis; and the mechanical aspects of the hip, knee, spine, shoulder, and foot.

**Features:**

- New "Solved Problems" chapter with clinically relevant biomechanical questions and their step-by-step solutions using mathematical and mechanical reasoning
- New chapters on biomechanics of the foot and gait analysis
- Detailed descriptions of simplified model calculations for determining static and dynamic joint load-a fundamental issue in orthopedic biomechanics
- Essential physics and mathematics only, with limited use of complex vector equations
- More than 300 line illustrations
- References and suggestions for further reading at the end of each chapter, serving as an overview of scientific work on the topic

Orthopedic Biomechanics, 2nd Edition, is an essential resource for practitioners and students of orthopedics, orthopedic surgery, prosthetics and orthotics, and physiotherapy. Comprehensive in scope but approachable in coverage, the book provides the insights and tools needed to make informed clinical decisions.

## Book Information

Paperback: 504 pages

Publisher: TPS; 2nd edition edition (October 9, 2015)

Language: English

ISBN-10: 3131768223

ISBN-13: 978-3131768223

Product Dimensions: 9.4 x 6.7 x 0.8 inches

Shipping Weight: 12.6 ounces (View shipping rates and policies)

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## Customer Reviews

"Orthopedic Biomechanics" sheds light on an important and interesting discipline at the interface between medical and natural sciences. Understanding the effects of mechanical influences on the human body is the first step toward developing innovative treatment and rehabilitation concepts for orthopedic disorders. This book provides valuable information on the forces acting on muscles, tendons, and bones. Beginning with the step-by-step fundamentals of physics and mechanics, it goes on to cover the function and loading of joints, movement in two- and three-dimensions, and the properties of biological tissues. This book explains the practical importance of biomechanics, including special chapters addressing the mechanical causes of disk prolapse, load on the spine in sitting and standing positions, and the correlation between mechanical loading and bone density. Key Features: Limited use of complex vector equations while providing in-depth treatment analysis Exquisitely illustrated, detailed descriptions of the mechanical aspects of every major joint in the body: hip, shoulder, knee, and lumbar spine Extensive references for further information Valuable appendixes describing the interaction between mechanical and biological functions as well as mathematical tools necessary to understand technically demanding concepts This book also analyzes techniques for changing the effects on bones and joints through therapy, training, external aids, modified behavior, and ergonomic improvements. An essential resource for orthopedists and physical therapists alike, it will help you understand past and current scientific work in the field and how to apply state-of-the-art solutions to the problems you'll encounter on a daily basis.

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