

THE BIOMECHANICS OF TRAUMA

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*For Pat, Julie, David, and Bob,
whose unqualified love and support
make all things possible*

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Preface

Improved methods of transportation, especially of the high-speed variety, have created a serious societal health problem, the deaths and injuries associated with malfunctions of the transportation system. This book is devoted to a special area of biomechanics, the mechanisms, treatment, and prevention of accidental trauma. Situated between the classic disciplines of engineering and medicine, biomechanics provides a means of applying engineering mechanics theory to the problem of accidental injury.

The text has been divided into two parts. The first part deals with basic issues in biomechanics such as restraint systems, structural properties of human tissues, and mathematical simulation of human structures. The second part considers the clinical and experimental aspects of injury to specific anatomic areas. The clinical topics have been prepared by physicians and the experimental aspects by engineers.

The book is intended to serve as an introduction to trauma biomechanics for both physicians and engineers. With an understanding of the physical properties of the human body and how traumatic injuries are produced, it should be possible to develop countermeasures that will prevent exposure or prevent or reduce injury when exposure is unavoidable.

Finally, improved methods of treatment can be developed if the injury mechanisms and human responses are understood. Only a multifaceted approach to accident prevention, injury reduction, and trauma treatment can produce an urgently needed decrease in the current deaths and injuries.

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