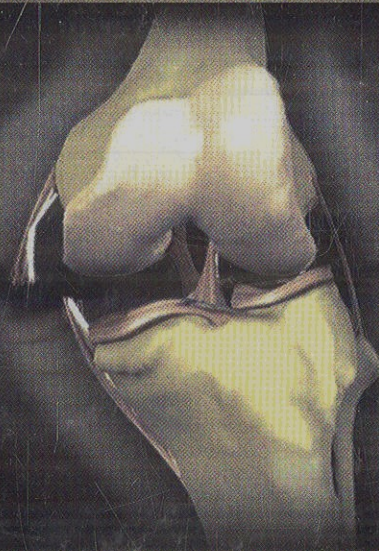


SECOND EDITION

BIOMECHANICS *of* MUSCULOSKELETAL INJURY



William C. Whiting • Ronald F. Zernicke

CONTENTS

Preface **vii** ■ Acknowledgments **ix**

CHAPTER 1	Overview and Perspectives on Injury	1
	Definition of Injury	2
	Perspectives on Injury	3
	Chapter Review and Suggested Readings	15
CHAPTER 2	Classification, Structure, and Function of Biological Tissues	17
	Embryology	18
	Tissue Types	20
	Arthrology	46
	Chapter Review and Suggested Readings	50
CHAPTER 3	Basic Biomechanics	53
	Kinematics	56
	Kinetics	58
	Fluid Mechanics	73
	Joint Mechanics	74
	Material Mechanics	80
	Biomechanical Modeling and Simulation	93
	Chapter Review and Suggested Readings	97
CHAPTER 4	Tissue Biomechanics and Adaptation	99
	Biomechanics of Bone	101
	Adaptation of Bone	107
	Biomechanics and Adaptation of Other Connective Tissues	112
	Biomechanics of Skeletal Muscle	118
	Adaptation of Skeletal Muscle	119
	Chapter Review and Suggested Readings	121

CHAPTER 5	Concepts of Injury and Healing	123
	Overview of Injury Mechanisms	124
	Principles of Injury	125
	Inflammation and Entrapment Conditions	133
	Bone Injuries	134
	Injuries in Other Connective Tissues	139
	Skeletal Muscle Injuries	144
	Joint Injuries	148
	Nonmusculoskeletal Injuries	149
	Chapter Review and Suggested Readings	151
 CHAPTER 6	 Lower-Extremity Injuries	 153
	Hip Injuries	154
	Thigh Injuries	161
	Knee Injuries	166
	Lower-Leg Injuries	184
	Ankle and Foot Injuries	190
	Chapter Review and Suggested Readings	201
 CHAPTER 7	 Upper-Extremity Injuries	 203
	Shoulder Injuries	204
	Upper-Arm Injuries	220
	Elbow Injuries	224
	Forearm Injuries	232
	Wrist and Hand Injuries	237
	Chapter Review and Suggested Readings	240
 CHAPTER 8	 Head, Neck, and Trunk Injuries	 241
	Head Injuries	242
	Neck Injuries	261
	Trunk Injuries	272
	Concluding Thoughts	286
	Chapter Review and Suggested Readings	287