Contents

Preface	xi
Accessing the Online Video	xv
Acknowledgments	xvii

PART I	BASIC CONCEPTS	1
1	Concepts of Rehabilitation	3
	The Rehabilitation Team	4
	Athletic Trainer as Rehabilitation Clinician	4
	Qualities of Professionalism	6
	Components of a Rehabilitation Program	8
	Evidence-Based Practice and Outcomes-Based Practice	13
	Basic Components of Therapeutic Exercise	18
	Return-to-Competition Criteria	21
	Psychological Considerations	21
	Summary	23
	Learning Aids	23
2	Concepts of Healing	27
	Primary and Secondary Healing	28
	Healing Phases	35
	Growth Factors	45
	Healing of Specific Tissues	46
	Tensile Strength During Healing	53
	Factors That Affect Healing	54
	Role of Therapeutic Exercise in Healing	60
	Summary	64
	Learning Aids	64
3	Concepts of Physics in Therapeutic Exercise	67
	Force	68
	Newton's Laws of Motion	69
	Center of Gravity	70
	Stability and Fixation	72
	Body Levers	74
	Levers and Force	77
	Physiological Muscle Advantages	79
	Other Concepts Related to Muscle Function	82
	Summary Learning Aids	86 86
4	Examination and Assessment	01
	for Rehabilitation	91
	Subjective and Objective Examination: Making a Profile	93
	Interpreting Results and Designing a Rehabilitation Program	102
	Keeping Rehabilitation Records	106
	Summary	119
	Learning Aids	119

PART II THERAPEUTIC EXERCISE PARAMETERS AND TECHNIQUES

123

5	Range of Motion and Flexibility	125
	Defining Flexibility and Range of Motion	126
	Connective-Tissue Composition	126
	Effects of Immobilization on Connective Tissue	127
	Effects of Remobilization on Connective Tissue	130
	Mechanical Properties and Tissue Behavior in Range of Motion	131
	Neuromuscular Influences on Range of Motion	136
	Determining Normal Range of Motion	137
	Measuring Range of Motion	137 143
	Terminology in Goniometry Stretching Techniques	143
	Exercise Progression	144
	Special Considerations	150
	Summary	151
	Learning Aids	152
6	The ABCs of Proprioception	155
U	Neurophysiology of Proprioception	158
	Central Nervous System Proprioceptor Sites	160
	Balance	162
	Coordination	165
	Agility	167
	Therapeutic Exercise for Proprioception	168
	Summary	172
	Learning Aids	173
7	Muscle Strength and Endurance	175
	Neuromuscular Physiology	176
	Muscle Structure and Function	179
	Whole-Muscle Function	186
	Fast- and Slow-Twitch Fibers	190
	Muscle Strength, Power, Endurance, and Recovery	192
	Force Production	196
	Types of Muscle Activity	199
	Open and Closed Kinetic Chain Activity	202 204
	Evaluating Muscle Strength Gradations of Muscle Activity	204
	Strengthening Principles	209
	Programs of Goal Progressions	210
	Summary	214
	Learning Aids	217
8	Plyometrics	221
	Neuromuscular Principles	223
	Plyometric Production	224
	Plyometric Exercise Phases	225
	Pre-Plyometric Considerations	226
	Plyometric Program Design	228
	Plyometric Program Considerations	229

	Precautions and Contraindications	231
	Equipment	231
	Lower-Extremity Plyometrics	232
	Upper-Extremity and Trunk Plyometrics	240
	Summary	242
	Learning Aids	242
9	Functional and Performance-Specific	
	Development	245
	Definitions, Foundations, and Goals	246
	Contributions to Therapeutic Exercise	248
	Basic Functional Activities	250
	Performance-Specific Exercises	251
	Progression from Functional Exercises	
	to Performance-Specific Development	251
	Precautions	253
	Final Evaluation	255
	Lower-Extremity Functional and Performance-Specific Progression	255
	Upper-Extremity Functional and Performance-Specific Progression	261
	Returning the Patient to Full Participation	266
	Summary	266
	Learning Aids	266
ттт		
111	GENERAL THERAPEUTIC EXERCISE	
	APPLICATIONS	269
0	Posture and Body Mechanics	271
. •	Posture	272
	Muscle Imbalances	284

PART I

10	Posture and Body Mechanics	271
	Posture	272
	Muscle Imbalances	284
	Body Mechanics	288
	Body-Awareness Programs	293
	Summary	299
	Learning Aids	299
11	Ambulation and Ambulation Aids	303
	Normal Gait	304
	Clinical Gait Analysis	325
	Pathological Gait	326
	Normal Running Gait	330
	Mechanics of Ambulation With Assistive Devices	336
	Summary	344
	Learning Aids	345
12	Aquatic Therapeutic Exercise	347
	Physical Properties and Principles of Water	348
	Indications, Advantages, Precautions, and Contraindications	352
	Aquatic Therapeutic Exercise Principles and Guidelines	354
	Deep-Water Exercise	356
	Aquatic Therapeutic Exercises	356
	Summary	379
	Learning Aids	379

13	Manual Therapy	383
	Critical Analysis	386
	Massage	386
	Myofascial Release	389
	Myofascial Trigger Points	394
	Muscle Energy	419
	Proprioceptive Neuromuscular Facilitation	421 429
	Other Manual Therapies Joint Mobilization	429
	Summary	448
	Learning Aids	448
14	Therapeutic Exercise Equipment	451
T	Range-of-Motion Equipment	452
	Resistive Equipment	456
	Swiss Balls	466
	Foam Rollers	470
	Aquatic Equipment	471
	Manual Therapy Equipment	475
	Plyometric Equipment	477
	Summary Learning Aids	478 478
,	Learning Alds	470
15	Total Body Considerations	481
	Activity Levels, Stages of Life, and Health Care	482
	Pediatric Considerations	484
	Geriatric Considerations	490
	Joint Replacement	494
	Tendinopathy	508
	Summary	515
	Learning Aids	516
PART IV	SPECIFIC APPLICATIONS	521
16	Creating the Rehabilitation Program	523
IU	Program Contents	525
	Phases of Rehabilitation and Therapeutic Exercise	526
	Individualization of Therapeutic Exercise	530
	Summary	530
	Learning Aids	531
17	Sacroilium and Pelvic Stabilization	533
	General Rehabilitation Considerations	534
	Rehabilitation Techniques	540
	Pathological Sacroilial Alignment	550
	Special Rehabilitation Applications	556
	Summary	568

Learning Aids

568

18	Spine General Rehabilitation Considerations Rehabilitation Techniques Special Rehabilitation Applications Summary Learning Aids	571 572 573 610 632 633
19	Shoulder and Arm General Rehabilitation Considerations Rehabilitation Techniques Flexibility Exercises Strengthening Exercises Stabilization and Proprioception Exercises Plyometric Exercises Functional and Performance-Specific Exercises Special Applications for Rehabilitation Summary Learning Aids	637 639 644 654 668 687 696 701 702 731 731
20	Elbow and Forearm General Rehabilitation Considerations Rehabilitation Techniques Joint Mobilization Flexibility Exercises Strengthening Exercises Functional and Performance-Specific Exercises Special Rehabilitation Applications Summary Learning Aids	735 736 739 740 744 749 755 756 756 772 773
21	Wrist and Hand General Rehabilitation Considerations Soft-Tissue Mobilization Joint Mobilization Flexibility Exercises Strengthening Exercises Plyometric Exercises Functional and Performance-Specific Exercises Special Rehabilitation Applications Summary Learning Aids	777 779 791 792 802 809 819 820 820 820 840 841
22	Foot, Ankle, and Leg General Rehabilitation Considerations Common Structural Deformities Orthotic Treatment for Foot Deformities Determining Proper Footwear for Patients Soft-Tissue Mobilization Deep-Tissue Massage Joint Mobilization Flexibility Exercises Strengthening Exercises	845 846 853 857 862 870 870 870 878 883

	Proprioception Exercises	890
	Functional and Performance-Specific Exercises	894
	Special Rehabilitation Applications	894
	Summary	912
	Learning Aids	913
23	Knee and Thigh	917
	General Rehabilitation Considerations	919
	Soft-Tissue Mobilization	929
	Joint Mobilization	931
	Flexibility Exercises	936
	Strengthening Exercises	942
	Proprioception Exercises	955
	Functional and Performance-Specific Exercises	955
	Special Rehabilitation Applications	956
	Summary	985
	Learning Aids	985
24	Нір	989
	General Rehabilitation Considerations	990
	Soft-Tissue Mobilization	995
	Joint Mobilization	996
	Flexibility Exercises	1000
	Strengthening Exercises	1009
	Proprioception Exercises	1020
	Functional and Performance-Specific Exercises	1021
	Special Rehabilitation Applications	1021
	Summary	1037
	Learning Aids	1037

Glossary	1041
References	1057
Index	1129
About the Author	1149