

Table of Contents

Preface	V
1 Analysis of sequences of movements in sport from a functional-anatomical point of view	1
1.1 Adaptability of the motor system as a process and outcome	2
1.2 Form, structure and function	3
1.3 Open and closed joint systems	4
1.4 The cooperation between muscle groups which form muscle slings	7
1.5 Coordinated capabilities – functions and the basis for “motor learning”	9
1.6 Functional principles for sequences of movements	10
1.7 What should be considered with regard to muscular imbalance	12
1.8 Learning to observe and describe	15
 2 Applied anatomy in sport	 17
2.1 Extensor slings of the lower extremity	19
<i>Anatomy revisited: The central role of the spinal column in dynamic and static sequences of movements</i>	22
2.2 Extensor slings in whole-body movements	30
Overextension of the body backwards	30
Long- and middle-distance runners	32
Sprinter (at the start of the 100 meters)	36
Javelin thrower	40
Medicine-ball thrower	42
Wrestler (standing combat)	44
Wrestler (ground combat)	46
Boxer	48
Gymnast	50
Rower	52
<i>Anatomy revisited: Lesion-prone weak point: lumbo-sacral transition</i>	56
Weightlifter	59
Inhibitory and braking function of the extensor sling	62
2.3 Flexor slings of the lower extremity	64
Basic movements	64
Sudden and brisk lifting of the leg	66
Ballet dancer	68

2.4	Flexor and extensor slings in whole-body movements	70
	Hurdler	70
	Long jumper	72
	High jumper	76
	Rope climber	78
	Wall climber	78
	<i>Anatomy revisited: Muscles of the trunk and the shoulder girdle in artistic gymnastics</i>	80
2.5	Muscle slings in static sequences of movements	84
	Gymnast on parallel bars	84
	Gymnast on the rings	86
	High-bar gymnast	92
	<i>Anatomy revisited: Role and integration of the abdominal muscles in lateral inclination and rotation</i>	94
2.6	Muscle slings in lateral inclination and rotation of the body	98
	Lateral inclination of the trunk	100
	Rhythmic gymnastics	104
	Gymnastics with round weights	107
	<i>Anatomy revisited: The central role of the knee joint in many sports disciplines</i>	108
	Football player (crossing the ball)	112
	Football player (volleying the ball)	114
	Handball player (jump shot)	116
	Discus thrower	119
	Javelin thrower	120
	Hammer thrower	122
2.7	Combination of muscle slings	124
	Shot-putter	124
	Race-walker	126
	Short-distance runner	128
	Final Remarks	130
3	Appendix	131
	Afterword	132
	Source of figures and tables	133
	References	133
	Index	136