

Contents

1	Anatomy and Functional Anatomy of the Hand	2
1.1	Introduction	2
	Blood Supply to the Wrist Joint and Hand	46
	Lymphatics of the Hand	47
1.2	Structure and Function of the Proximal and Distal Radioulnar Joints	2
1.2.1	Anular Ligament of the Radius	3
1.2.2	Oblique Cord	4
1.2.3	Interosseous Membrane of the Forearm	4
1.2.4	Structure and Function of the Triangular Fibrocartilage Complex	6
	Ulnocarpal Disc and Meniscal Homologue	8
	Palmar and Dorsal Radioulnar Ligaments	8
	Ulnolunate and Ulnotriquetral Ligaments	8
	Ulnar Collateral Ligament of Wrist Joint	8
	Tendon Sheath of the Extensor Carpi Ulnaris Muscle	9
1.2.5	Muscles of the Radioulnar Joint—Pronation and Supination	9
	Pronator Muscles	9
	Supinator Muscles	10
1.3	Wrist and Movement Axes	10
1.3.1	Movement Axes	10
1.3.2	Structure and Function of the Wrist Joint	12
	Carpal Bones	12
	Joints	14
1.3.3	Ligament System and Wrist Stability	16
	Superficial Layer of the Ligaments of the Wrist	17
	Middle Layer of Ligaments of the Hand	19
	Deep Layer of the Ligaments of the Hand	23
	Conclusions	25
1.3.4	Muscles of the Wrist: Extension–Flexion, Radial Deviation–Ulnar Deviation, and Circumduction	25
	Muscles Involved in Flexion and Ulnar Deviation of the Wrist	26
	Muscles Involved in Extension and Radial Deviation of the Wrist	28
1.3.5	Arthrokinematics of the Wrist Joint	28
	Kinematics of the Wrist: General Aspects	30
	Arthrokinematics of the Wrist Joint: Specific Aspects	30
1.3.6	Other Important Anatomical Structures of the Wrist	33
	Dorsal and Palmar Tendon Compartments	33
	Carpal Tunnel, Ulnar Tunnel, and Innervation of the Hand	38
1.4	Thumb	48
1.4.1	Movements and Range of Motion	48
	Movements of the Thumb CMC Joint	48
	Range of Motion of the Thumb MCP and IP Joints	49
1.4.2	Structure and Function of the Thumb CMC Joint	49
	Ligaments of the Thumb CMC Joint	51
	Muscles of the Thumb CMC Joint	54
1.4.3	Structure and Function of the Thumb MCP and IP Joints	57
	MCP Joint of the Thumb	58
	IP Joint of the Thumb	59
1.5	Structure and Function of the Palm	60
1.5.1	Structure and Function of the Second to Fifth Metacarpals	60
1.5.2	Muscles of the Metacarpals	62
	Dorsal and Palmar Interossei	62
	Lumbricals	63
	Abductor Digiti Minimi Muscle	63
	Flexor Digiti Minimi Brevis Muscle	64
	Opponens Digiti Minimi Muscle	64
1.5.3	Palmar Aponeurosis (Metacarpal Area)	64
	Longitudinal Fibers	65
	Transverse Fibers	66
1.6	Structure and Function of the Finger Joints	66
1.6.1	Structure and Function of the MCP Joints	66
	Collateral Ligaments	67
	Palmar and Dorsal Connective Tissue Plate	68
	Deep and Superficial Transverse Metacarpal Ligaments	69
1.6.2	Structure and Function of the PIP Joints	69
	Collateral Ligaments of the PIP Joint	70
	Palmar and Dorsal Fibrocartilage Plate	70
	Anular and Cruciate Ligaments	70
	Dorsal Digital Expansion	72
1.6.3	Structure and Function of the DIP Joints	73
1.6.4	Range of Motion of the MCP, PIP, and DIP Joints	75

1.6.5	Extrinsic Muscles of the Finger: Flexors and Extensors	75	Extrinsic Flexors of the Finger	76
	Extensor Apparatus of the Finger	75		
2	Surface Anatomy of the Forearm, Wrist, and Hand Structures	82		
2.1	Introduction	82	Second Dorsal Tendon Compartment	88
2.2	Practical Foundations of Surface Anatomy	82	Third Dorsal Tendon Compartment	89
2.3	Practical Procedure for Surface Anatomy of the Forearm, Wrist, and Hand	83	Fourth Dorsal Tendon Compartment	89
			Fifth Dorsal Tendon Compartment	90
			Sixth Dorsal Tendon Compartment	90
2.3.1	Surface Anatomy of the Distal Radioulnar Joint and Wrist	83	2.3.3 Surface Anatomy of the Extrinsic Dorsal Forearm Muscles	91
	Radiocarpal Joint Line and Its Structures	83	2.3.4 Surface Anatomy of the Palmar Wrist, Three Palmar Tendon Compartments, and Palmar Nerves and Vessels	92
	Metacarpophalangeal Joint Line and Its Structures	84	2.3.5 Surface Anatomy of the Extrinsic Palmar Forearm Muscles	96
	Dorsal Carpal Bones	84	2.3.6 Surface Anatomy of the Palm, Thumb, and Fingers	96
2.3.2	Surface Anatomy of the Six Dorsal Tendon Compartments	86	2.3.7 Surface Anatomy of the Intrinsic Muscles of Thenar, Palm, and Hypothenar Areas	98
	First Dorsal Tendon Compartment	87		
	References			100
	Index			106