

Contents

SECTION 1 **Introduction to Ultrasound Imaging**

1.	Ultrasound	2
2.	Speed of Sound	4
3.	Attenuation	6
4.	Reflection	8
5.	Beam Width (Slice Thickness)	11
6.	Anisotropy	13
7.	Spatial Compound Imaging	15
8.	Doppler Imaging	18
9.	Ultrasound Transducers	21
10.	Transducer Manipulation	22
11.	Needle Imaging	24
12.	Approach and Techniques	31
13.	Sonographic Signs of Successful Injections	37
14.	Continuous Peripheral Nerve Blocks	39
15.	Three-Dimensional Ultrasound	48
16.	Ultra-High Frequency Ultrasound	51

SECTION 2 **Structures**

17.	Anatomic Structures	56
18.	Skin and Subcutaneous Tissue	57
19.	Peripheral Nerves	59
20.	Muscle	64
21.	Tendons and Ligaments	67
22.	Arteries	71
23.	Veins	74
24.	Bone	76

CONTENTS

25.	Pleura	78
26.	Peritoneum	79

SECTION 3 **Upper Extremity Blocks**

27.	Interscalene and Superior Trunk Blocks	81
28.	Supraclavicular Block	91
29.	Suprascapular Nerve Block (Anterior Approach, above the Clavicle)	96
30.	Infraclavicular Block	100
31.	Axillary Block	110
32.	Musculocutaneous Nerve Block	121
33.	Forearm Blocks	129
34.	Radial Nerve Block	130
35.	Median Nerve Block	135
36.	Ulnar Nerve Block	140

SECTION 4 **Lower Extremity Blocks**

37.	Lateral Femoral Cutaneous Nerve Block	145
38.	Fascia Iliaca Block	150
39.	Femoral Nerve Block	153
40.	Adductor Canal Block	162
41.	Obturator Nerve Block	169
42.	Sciatic Nerve Block	176
43.	Popliteal Block	189
44.	Posterior Femoral Cutaneous Nerve Block	196
45.	Pericapsular Nerve Group (PENG) Block for Hip Analgesia	201
46.	Infiltration of Local Anesthetic between the Popliteal Artery and Capsule of Knee (iPACK) Block	206
47.	Ankle Blocks	211
48.	Saphenous Nerve Block in the Leg	213

CONTENTS

49.	Deep Peroneal Nerve Block	216
50.	Superficial Peroneal Nerve Block	222
51.	Sural Nerve Block	227
52.	Tibial Nerve Block	233

SECTION 5 **Trunk Blocks**

53.	Intercostal Nerve Block	241
54.	External Oblique Intercostal Plane Block	249
55.	Serratus Anterior Plane Block	254
56.	Pectoral Nerve Block (The PECS Block)	259
57.	Transversus Thoracis Muscular Plane Block (Parasternal Block)	265
58.	Rectus Sheath Block	271
59.	Ilioinguinal and Iliohypogastric Nerve Blocks	279
60.	Transversus Abdominis Plane Block	287
61.	Erector Spinae Plane Block	296
62.	Thoracic Paravertebral Block	302
63.	Neuraxial Block	330
64.	Caudal Epidural Block	340

SECTION 6 **Head and Neck Blocks**

65.	Supraorbital Nerve Block	348
66.	Mental Nerve Block	352
67.	Suprazygomatic Maxillary Nerve Block	357
68.	Superior Laryngeal Nerve Block	362
69.	Transtracheal Block	367
70.	Greater Occipital Nerve Block	371
71.	Cervical Plexus Block	377
72.	Stellate Ganglion Block (Cervicothoracic Sympathetic Ganglion Block)	388

CONTENTS

SECTION 7 **Safety Issues and New Technology**

73.	Safety: Practical Techniques to Prevent Complications During Ultrasound-Guided Nerve Blocks	398
74.	Ultrasound-Guided Percutaneous Cryoneurolysis for Acute Pain	409
75.	Artificial Intelligence in Ultrasound-Guided Regional Anesthesia	421
	Appendix 1	433
	Appendix 2	438
	Appendix 3	452
	Appendix 4	456
	Index	477