Contents

Preface v

PART I: Foundations of Ultrasound in Rheumatology

1. Introduction to Ultrasound 3

2. Physics of Ultrasound and Image Acquisition 16

3. Ultrasound Equipment and Setup for Rheumatologists: Normal Anatomy and Basic Sonographic Landmarks 29

4. Doppler Ultrasound in Rheumatology: Principles and Applications 34

5. Ultrasound Artefacts and Pitfalls 39

6. Safety, Advantages, Limitations, and Quality Assurance in Rheumatology Ultrasound 45

PART II: Joint-Specific Ultrasound

7. Ultrasound Imaging of the Wrist and Hand 51

8. Ultrasound Imaging of the Knee 63

9. Ultrasound Imaging of the Foot and Ankle 71

10. Ultrasound Imaging of the Elbow 80

11. Ultrasound Imaging of the Hip 87

12. Ultrasound Imaging of the Shoulder 94

PART III: Ultrasound in Specific Rheumatic Diseases

13. Ultrasound in Rheumatoid Arthritis 105

14. Ultrasound in Ankylosing Spondylitis and Axial Spondyloarthritis 109

15. Ultrasound in Psoriatic Arthritis 114

16. Ultrasound in Sjögren's Syndrome 118

17. Ultrasound in Systemic Lupus Erythematosus (SLE) 122

18. Ultrasound in Gout and Calcium Pyrophosphate Deposition Disease 126

19. Ultrasound in Osteoarthritis 130

20. Ultrasound in Vasculitis (including Giant Cell Arteritis) 135

21. Ultrasound in Connective Tissue Diseases (CTDs) 139

22. Ultrasound in Soft Tissue Rheumatology (Tendinopathies, Bursitis, Enthesitis) 142

23. Ultrasound in Diabetic Cheiroarthropathy and Endocrine-Associated Arthropathies 145

PART IV: Interventional and Advanced Applications

24. Ultrasound-Guided Injections 149

25. Ultrasound in Aspirations, Biopsy, and Tissue Sampling 153

26. Ultrasound in Sports Medicine and Rehabilitation 156

PART V: Emerging Technologies and Future Directions

27. Artificial Intelligence, Machine Learning, and Future Innovations in Ultrasound in Rheumatology 161

PART VI: Case Studies and Practical Applications

28. Case Studies and Real-World Applications of Ultrasound Imaging in Rheumatology 167

Supplementary Atlas 175

Glossary 195

Index 197