

James M. Daniels
William W. Dexter
Editors

Basics of Musculoskeletal Ultrasound

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William W. Dexter

Contents

1 Introduction	1
James M. Daniels and William W. Dexter	
2 Understanding Accreditation and Certification in Musculoskeletal Ultrasound	3
Joshua G. Hackel	
3 Choosing Ultrasound Equipment	7
Paul D. Tortland	
4 Knobology	11
Allyson S. Howe	
5 Tissue Scanning	15
J. Herbert Stevenson	
6 Hand and Fingers	29
Matthew C. Bayes	
7 Wrist	35
Joseph J. Albano	
8 Elbow	43
Pierre d’Hemecourt	
9 Shoulder	53
Mark E. Lavallee	
10 Foot and Toes	63
Kevin deWeber	
11 Ankle	69
John Hatzenbuehler	
12 Knee	77
Patrick A. Smith and Matt E. Thornburg	
13 Hip	87
John Charles Hill and Matthew S. Leiszler	
14 Groin	93
Anthony E. Joseph	
15 Ultrasound Guidance of Injections	99
Erik Adams	

16 Rheumatologic Findings	119
Ralf G. Thiele	
Appendix: Musculoskeletal Ultrasound Checklist	127
Index	129

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Clinical ultrasonography has been around for decades. In Europe, it also has been used for many years, but the way it is utilized differs from the system developed in North America.

In Europe, ultrasound scanning is introduced to medical students very early in their training. These skills are then supplemented in postgraduate training. In the United States, clinical examination skills are taught to all students, but very few are exposed to clinical ultrasonography. Traditionally, a clinician examines the patient, and if it is determined that an ultrasound study is necessary, a comprehensive scan is performed by a highly trained technician, a sonographer. The images are then interpreted by a highly trained physician, a radiologist, who then generates a detailed report back to the clinician. This paradigm has shifted slightly over the years, with cardiologists and obstetricians using ultrasound as a bedside tool to practice medicine, but this training is limited in scope and is only taught in residency or fellowship. Recently, the United States has adopted a hybrid of these two systems, referred to as “point-of-care” ultrasonography. Students and practicing clinicians are now being trained to use bedside ultrasound as an important tool to diagnose and treat patients (i.e., starting central lines in the ICU, FAST scans in the Emergency Department, dynamic scanning of shoulder joint).

This model integrates the history and physical exam along with treatment decisions into one process by one clinician. It not only decreases the cost and time of the process, it allows

the clinician to evaluate three-dimensional real-time anatomy and physiology, which further adds to the accuracy of the diagnosis. These “point-of-care” musculoskeletal ultrasound studies (POC MSK/US) may or may not always include the “comprehensive” evaluation that traditional ultrasound examinations do, depending on the reason they were performed. These scans are to supplement the clinical examination and should not be used as a stand-alone way to diagnose the patient’s condition. The use of the ultrasound machine can be compared to the use of a stethoscope in the clinical setting. The stethoscope, as we know it, was first used in France in the early 1800s by Dr. René Laennec, but it wasn’t widely used until the mid-1900s, when Rappaport and Sprague were able to mass-produce a lightweight, relatively affordable model. Ultrasound technology is currently following this trend. We predict that POC US will be the stethoscope of the twenty-first century. In fact, the year 2013 has been heralded as “The Year of Sonography” by a number of health-care organizations. The use of POC US has vastly changed the way musculoskeletal medicine is being practiced today and will transform the way we practice in the future.

We propose to use an ultrasound machine as one would a stethoscope—to no longer view it as a test to be ordered but as an extension of the physical examination. Most textbooks on this subject are written by radiologists with years of experience in the traditional paradigm described above. This book is written by busy clinicians with decades of experience using clinical ultrasound and could be used as a stand-alone curriculum for POC MSK/US.

This book is laid out in a way to become a bedside aid to assist in POC MSK/US scanning. Each chapter emphasizes one particular skill set. Introduction chapters demonstrate knobology, tissue scanning techniques, and the certification/accreditation process for MSK/US. Later chapters concentrate on particular regions of the body. The main focus of each chapter revolves around a table that shows probe positions, patient positioning, surface anatomy, and underlying structures to be scanned. A small amount of text accompanies each table, but this book focuses on clinical exam skills. A list

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