

# Common Musculoskeletal Problems: A Handbook



James M. Daniels • M. Rebecca Hoffman  
Editors

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A Handbook

 Springer

*Editors*

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# Chapter 1

## Introduction

**James M. Daniels and M. Rebecca Hoffman**

This book differs from other texts on the market. It is not meant to serve as a comprehensive text for all musculoskeletal conditions; rather, it has been produced to act as an off-the-shelf guide to assist healthcare providers evaluating patients presenting with common musculoskeletal complaints in the primary care setting. It is best used at the point of care and should not be considered a primary reference text.

This book results from a \$750,000 research grant that studied how comfortable primary care providers felt when treating musculoskeletal conditions. Resident and attending family physicians reported feeling unprepared and uncomfortable diagnosing and treating a variety of musculoskeletal conditions, although all agreed that they see these kinds of conditions frequently in their practices. This text has been created with these busy primary care providers in mind. The content was created to train primary care residents but has also been used to help educate hundreds of medical students, athletic training students, physician assistant students, student nurses, and attending physicians in a variety of clinical specialties who have interest in the subject matter.

### **A Primary Care Approach to the Patient**

The primary care provider operates in a different environment than an orthopedic surgeon does; therefore, the approach to the patient presenting in the primary care clinic must also differ from the specialist's approach.

In the primary care setting, a patient with a musculoskeletal complaint may include his or her complaint with other complaints or agenda. A 42-year-old female complaining of monthly episodes of back pain, menorrhagia, and desiring contraception may be dealing with a gynecologic issue that is causing her pain.

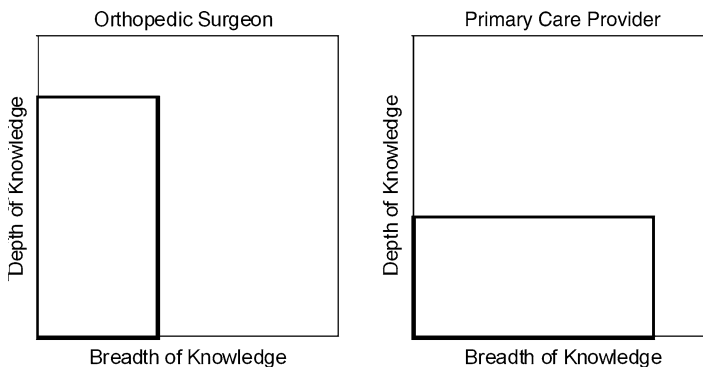
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A 60-year-old man complaining of nighttime back pain and increased urinary frequency may have prostate cancer. A 20-year-old female complaining of marriage problems, crying spells, and back pain might be dealing with depression with somatic dysfunction. A 47-year-old male presenting for a routine physical who on review of systems admits to leg pain and numbness when he coughs or jogs may, in fact, have nerve root impingement. All these patients have very different reasons for their symptoms, some of which might not be musculoskeletal in nature. Not all of them may be best served by performing a detailed musculoskeletal exam. The office visit must address a number of different complaints that may or may not be related to each other, and finding time to address these issues becomes challenging. The busy primary care provider must find a way to recognize and deal with these challenges.

The approach to the patient by physicians who have a referral practice is very different, largely because the patient population they serve is different. This changes not only the initial approach to the patient but also what types of investigations and testing should be done. Certain examination techniques may be highly important for an orthopedic surgeon but might not be as useful for the primary care provider. Similarly, one can expect that a spine MRI is going to have a higher false positive rate in a primary care population than in that of the spine surgeon simply because of the population they treat. The way that students are taught about musculoskeletal medicine can also vary greatly, depending on their mentors' training and the population of patients they see.

How detailed does the primary care provider's knowledge base need to be? For a specialist, we expect great depth of knowledge with relatively narrow breadth. For the primary care provider, we expect a much broader knowledge base with less depth. If we graphed depth vs. breadth of knowledge, we would see very different graphs (Fig. 1.1). These graphs may have the same overall area, but the distribution varies depending on the training the physician has had and the population the physician has been trained to serve. With this book, we attempt to provide information that is relevant to and directly applicable to patient care in the primary care setting.



**Fig. 1.1** Knowledge base in musculoskeletal medicine

## Layout

This book is divided into reference chapters, each of which focuses on a specific joint or region of the body. Each chapter is laid out in the following basic format:

1. *Anatomy*: Basic anatomy is presented in written and/or diagrammatic form; in some cases, more detailed anatomy is discussed as it relates to common conditions. Surgical anatomy is not included, as it is not necessary for the outpatient evaluation and management of most common musculoskeletal conditions.
2. *Red flags*: Certain conditions require either immediate treatment or referral or may represent a condition that, if not diagnosed or treated, may result in serious sequelae for the patient. Red flags are history or exam findings or diagnoses that the healthcare provider needs to recognize as potentially serious.
3. *Approach to the patient*: Important portions of clinical history and physical exam findings are reviewed. Whenever possible, these are based on evidence-based materials. The clinical evaluation component of the text is presented as a “tear sheet” format, which can act as a guide or “memory jogger” for the encounter, or when filled out completely, can serve as a component of the medical record.
4. *Common clinical presentations and management*: Evaluation and management of the most common conditions that present in the outpatient setting are discussed.
5. *Flow diagram*: Many times, a specific diagnosis, while desirable, is not essential for the management of common musculoskeletal complaints. The more important issues are recognition of the potential “red flag” problems and appropriate plans for initial management, follow-up, and reevaluation. The disposition flow sheet helps direct the examiner in management and follow-up of the patient’s problem.

The online material for this book contains the downloadable tear sheets that can be copied for a paper record or incorporated into electronic medical record. They are also ICD-9 coded for billing purposes.

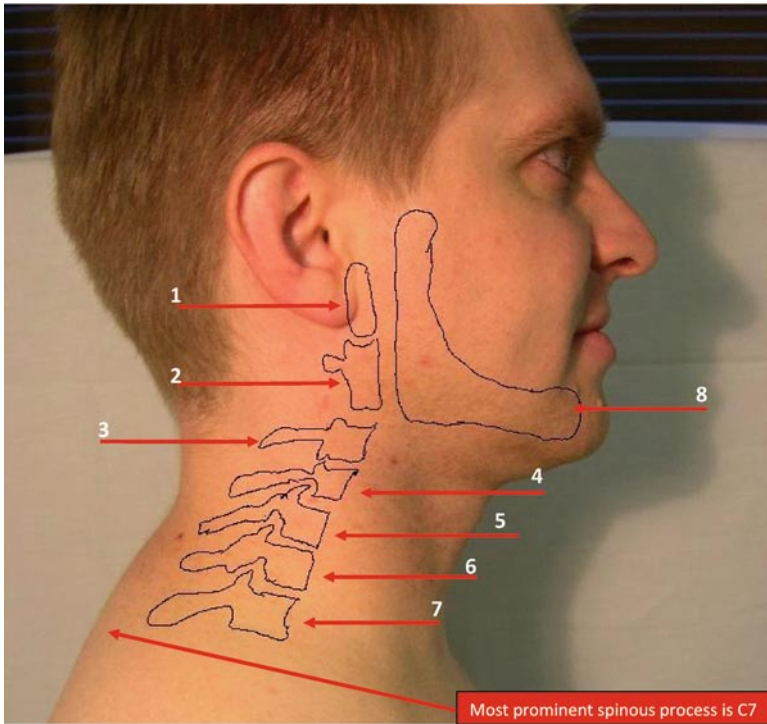
For a medical or athletic training student, a reasonable goal for using this book would be for the student to work through the red flags, anatomy, and clinical evaluation portions of each joint. For the primary care resident learner, a reasonable goal would be for the resident to have a good differential diagnosis and treatment plan for each joint or region. For the practicing primary care provider, this book serves as a point-of-care resource for evaluating and managing complaints that may be seen in the office setting. The user-friendly approach to each joint or body area and its unique layout make it an easy-to-use guide for primary care providers at any level of training.

# Chapter 2

## The Cervical Spine

James M. Daniels and Joel Kary

### Functional Anatomy



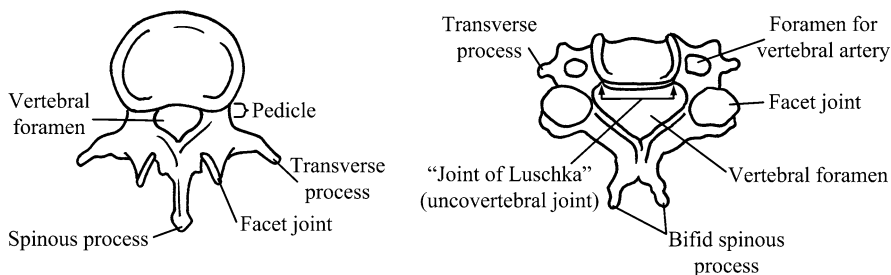
**Fig. 2.1** Surface anatomy of cervical spine

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Figure 2.1 illustrates the surface anatomy of the cervical spine (C-spine). The C-spine consists of seven vertebrae (C1–C7) and supports the weight of the head (approximately 14 pounds). The first two vertebrae are called the axis and atlas, respectively, and do not have a disc between them, but are closely bound together by a complex of ligaments. The C1 (axis) “ring” rotates around the odontoid or “peg” of C2 (atlas), allowing for almost 50% of total cervical rotation. The spinal canal is housed within the cervical vertebrae and is widest between the C1 and C3 levels (A-P diameter 16–30 mm) and narrows as it progresses caudally (14–23 mm). When the neck is fully extended, this canal can narrow an additional 2–3 mm.

Cervical spine vertebrae differ from lumbosacral vertebrae in several ways. First, there are foramina on each side which allow passage of the vertebral arteries. Additionally, the facet joints in the C-spine have steeper angles which allow for more rotation between vertebrae without subluxation. The most important difference, however, is the nonsynovial joint, known as the uncovertebral joint or “joint of Luschka.” During midlife, this joint prevents a disc rupture from directly pressing onto the nerve root. This means that most disc herniations in the neck occur posteriorly (unlike the LS spine, in which most herniations occur laterally). As we age, these joints can form osteophytes that can impinge upon the nerve root or compress the cervical cord directly causing cervical myelopathy. Figure 2.2 shows the major differences between lumbar and cervical vertebrae.



**Fig. 2.2** Comparison of cervical (*left*) and lumbosacral (*right*) vertebrae

## Red Flags

Some serious conditions can present as neck pain, and the following are considered “red flag” conditions which should spur further evaluation.

1. *Trauma*: Neck pain in the setting of trauma should receive emergent evaluation and is best managed in an emergency department. If there is any fear of spine instability, 9-1-1 should be summoned.

2. *History of neck surgery*: New neck pain in a patient who has had prior neck surgical intervention must be approached with caution. Strong consideration to immediate referral should be given in all but the most clear-cut cases.
3. *Rapidly progressing neurological deficit*: Patients who present with rapid, progressive neurologic deficits should be suspected of having CNS involvement and should be urgently referred.

## **Approach to the Patient with Cervical Spine Pathology**

Neck pain is extremely common; almost 70% of the population experiences neck pain at some time. Neck pain accounts for almost 1% of all visits to primary care physicians in the United States.

History is quite helpful in sorting out different types of C-spine pathologies. Important questions include the nature, duration, and location of the pain, associated numbness or tingling in either or both upper extremities, duration of the pain, other musculoskeletal symptoms, and inquiring about any history of trauma.

In patients presenting with neck pain, the physical exam must include a neurologic evaluation. The necessary exam will differ with different types of patient presentations (evaluation is described in detail below). Most patients with neck pain in the absence of neurologic findings will have benign neck pain which requires no further workup. Two different sets of rules have been created to assist health care providers in determining when imaging is appropriate (the Canadian Task Force (CTF) X-ray Rules and the Nexus Rules). It has been suggested that the CTF rules are more relevant in the primary care setting. These rules are shown in Table 2.1.

## **Common Clinical Presentations**

### ***“Mechanical” Neck Pain***

This is by far the most common neck condition the primary care provider will encounter. Mechanical neck pain is typically reported as diffuse, nonspecific, and made worse with neck movement. Two-thirds of these patients have pain in their shoulders and upper arms in a nonradicular pain pattern. The other one-third of these patients will present with headaches sometimes radiating to the front of the head.

The primary goal in evaluation of patients with mechanical neck pain is to exclude worse pathology. In the absence of neurologic symptoms or neurologic