

Fourth Edition

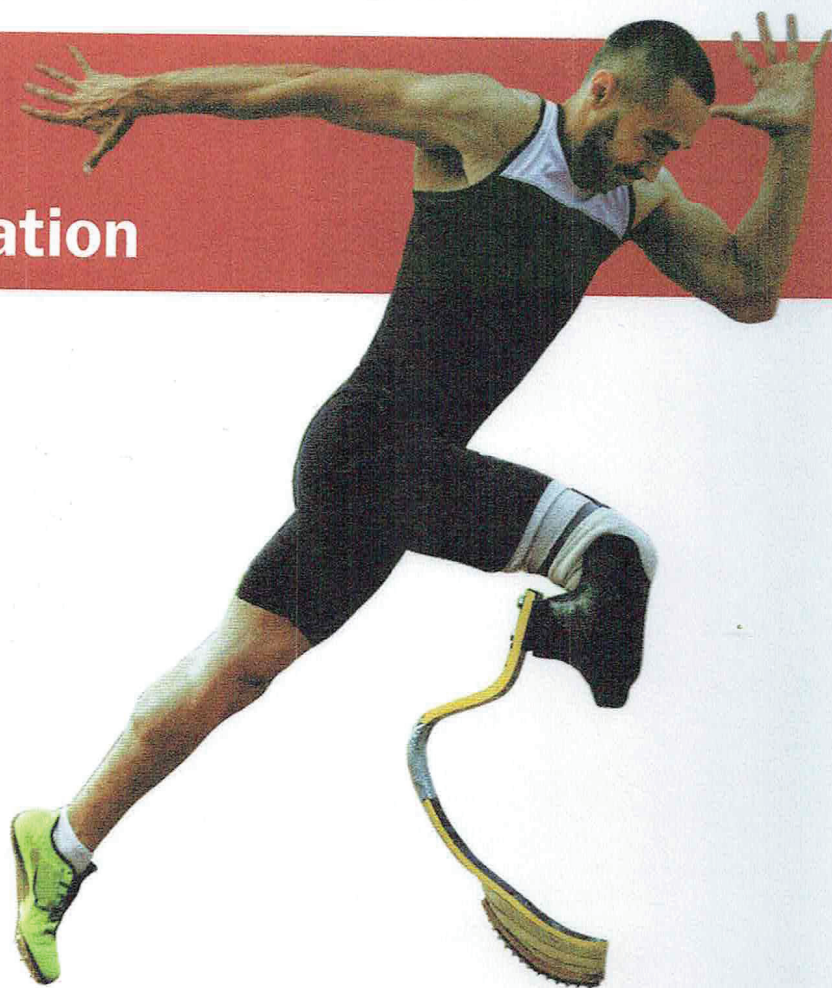


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# Essentials of Physical Medicine and Rehabilitation

Musculoskeletal  
Disorders,  
Pain, and Rehabilitation



Walter R. Frontera  
Julie K. Silver  
Thomas D. Rizzo, Jr.

ELSEVIER



# Scoliosis and Kyphosis

Stefano Negrini, MD  
 Francesca Di Felice, MD  
 Sabrina Donzelli, MD  
 Fabio Zaina, MD

## Synonyms

### Scoliosis

Curvature of the spine/back  
 Curved spine/back

### Kyphosis

Hunchback  
 Humpback  
 Roundback  
 Dorsum rotundum  
 Dowager's hump  
 Postural kyphosis  
 Gibbus deformity

## ICD-10 Codes

### Scoliosis

- 41.1 Juvenile and adolescent idiopathic scoliosis
- 41.12 Adolescent scoliosis
- 41.2 Other idiopathic scoliosis
- 41.3 Thoracogenic scoliosis
- 41.4 Neuromuscular scoliosis
- 41.5 Other secondary scoliosis
- 41.8 Other forms of scoliosis
- 41.9 Scoliosis unspecified

### Kyphosis

- 40.0 Postural kyphosis
- 40.1 Other secondary kyphosis
- 40.2 Other and unspecified kyphosis
- 40.29 Other kyphosis

## Definitions

### Scoliosis

Scoliosis is a three-dimensional deformity of the spine and the trunk<sup>1</sup>; it associates a spinal pathologic curve on the

frontal plane (curves of 10 degrees or more must be present to diagnose the disease), a rotation in the horizontal plane, and a disturbance of the normal curves on the sagittal plane (often in terms of flat back and hollow back).<sup>2,3</sup> Idiopathic scoliosis (IS) is the most common form (85% to 90%) and is diagnosed when a specific etiology is not identified<sup>4,5</sup>; the accepted classifications for idiopathic scoliosis during growth are listed in Table 153.1. Secondary scoliosis is a feature of different pathologic processes including neurologic diseases, systemic syndromes, connective tissue disorders, tumors, or trauma.

Adult spinal deformity (ASD) is defined when scoliosis is diagnosed after skeletal maturity. Scoliotic curves identified during adulthood can be developed prior to skeletal maturity, after skeletal maturity, or after surgery or trauma. Currently three classification systems based on the etiology, on the clinical impact of the deformity, and on curve types and additional modifiers have been developed for ASD: Aebi,<sup>6</sup> Schwab,<sup>7</sup> and SRS.<sup>8</sup> The last two were combined recently into a single classification.<sup>9</sup>

### Kyphosis

Kyphosis is a physiologic thoracic anterior concave spinal curvature in the sagittal plane, associated with cervical and lumbar lordosis in a physiologic conformation of the spine. Physiologic values for kyphosis during growth are between 20 to 25 degrees and 40 to 45 degrees. Sagittal plane alterations affect sagittal spinal curves in terms of both quantity and distribution. Thus, hyperkyphosis (HK), which is defined as an increase of the kyphosis, can be distinguished between high thoracic, thoracic, thoracolumbar, and lumbar HK according to the level where the apex of the curve can be identified.<sup>10</sup> Concerning the sagittal spinal profile, it is also important to distinguish alterations such as long kyphosis, normal kyphosis with a caudal vertebra below T12, and junctional kyphosis, flat back with distal kyphosis with caudal vertebrae below T12. An association between scoliosis and one of these sagittal deformities is possible (Fig. 153.1).

These conditions can be idiopathic or secondary to Scheuermann disease (a disease disturbing vertebral growth) or secondary to reduced trunk extensor muscle weakness or neurologic problems, congenital vertebral dysmorphic syndromes, trauma, tumors, or advanced degenerative disease of the spine.