Movement System Impairment Syndromes of the Extremities, Cervical and Thoracic Spines

Chapter IV: Movement System Syndromes of the Thoracic Spine

Figure 4-1. Forward bending.

Figure 4-2. Corrected forward bending.

TABLE 4-1
Thoracic Spine Movement Impairment Syndromes

Syndrome	Key Findings
Rotation-flexion	Pain with postures or motion that flex and rotate the thoracic spine.
Flexion	Pain with postures or motion that flex the thoracic spine. In the case of increased kyphosis, pain may occur with correction of the alignment.
Rotation-extension	Pain with postures or motion that extend and rotate the thoracic spine.
Rotation	Pain with postures or motion that rotate the thoracic spine.
Extension	Pain with postures or motion that extend the thoracic spine.

B

Figure 4-3. **A** and **B**, Normal thoracic alignment. (**B**, From Kendall FP, McCreary EK, Provance PG: *Muscles: testing and function*, ed 4, Philadelphia, 1993, Lippincott Williams & Wilkins.)

Figure 4-4. Normal thoracic curve.

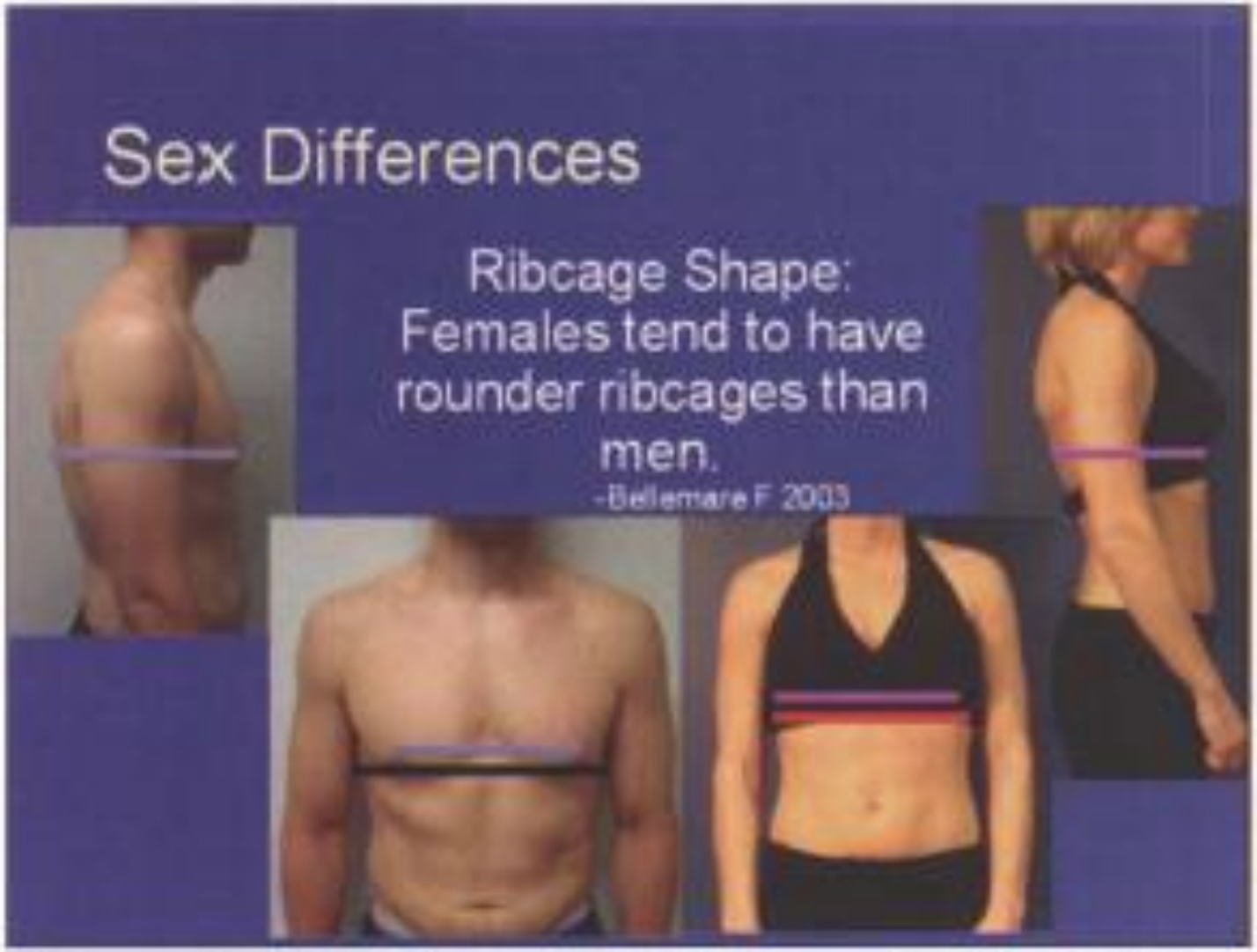

Figure 4-5. *Male:* Greater medial to lateral width *(black line)* than anterior posterior width *(gray line). Female* Medial to lateral width *(red line)* is similar to anterior posterior width *(pink line).*

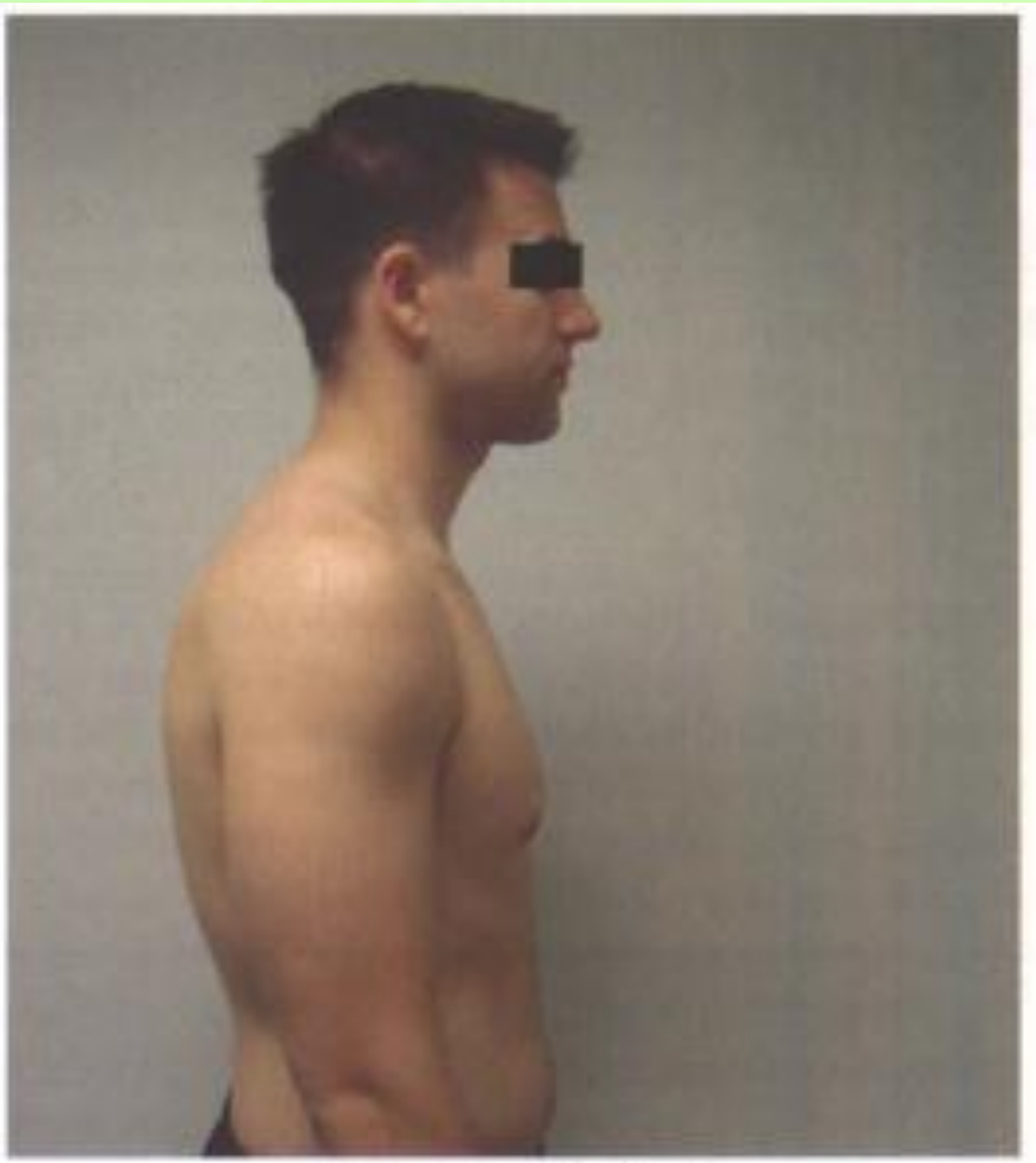

Figure 4-6. Kyphosis.

Figure 4-7. X-ray of Scheuermann's disease. (Courtesy of Dr. R. Cairns. From Cassidy JT, Petty RE: *Textbook of pediatric rheumatology*, ed 5, Philadelphia, 2005, Saunders.)

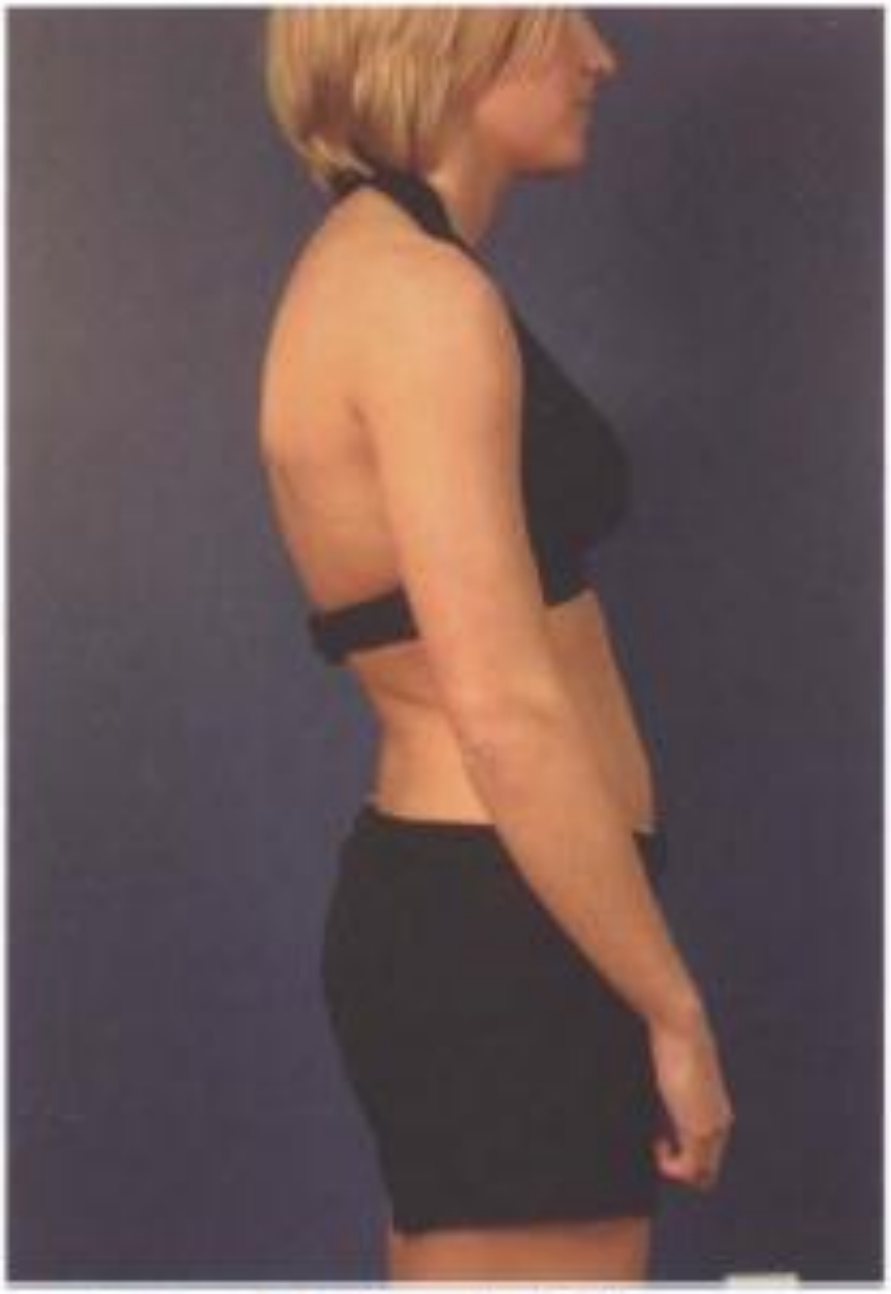

Figure 4-8. Swayback alignment.

Figure 4-9. Corrected swayback alignment.

Figure 4-10. Flat thoracic spine.

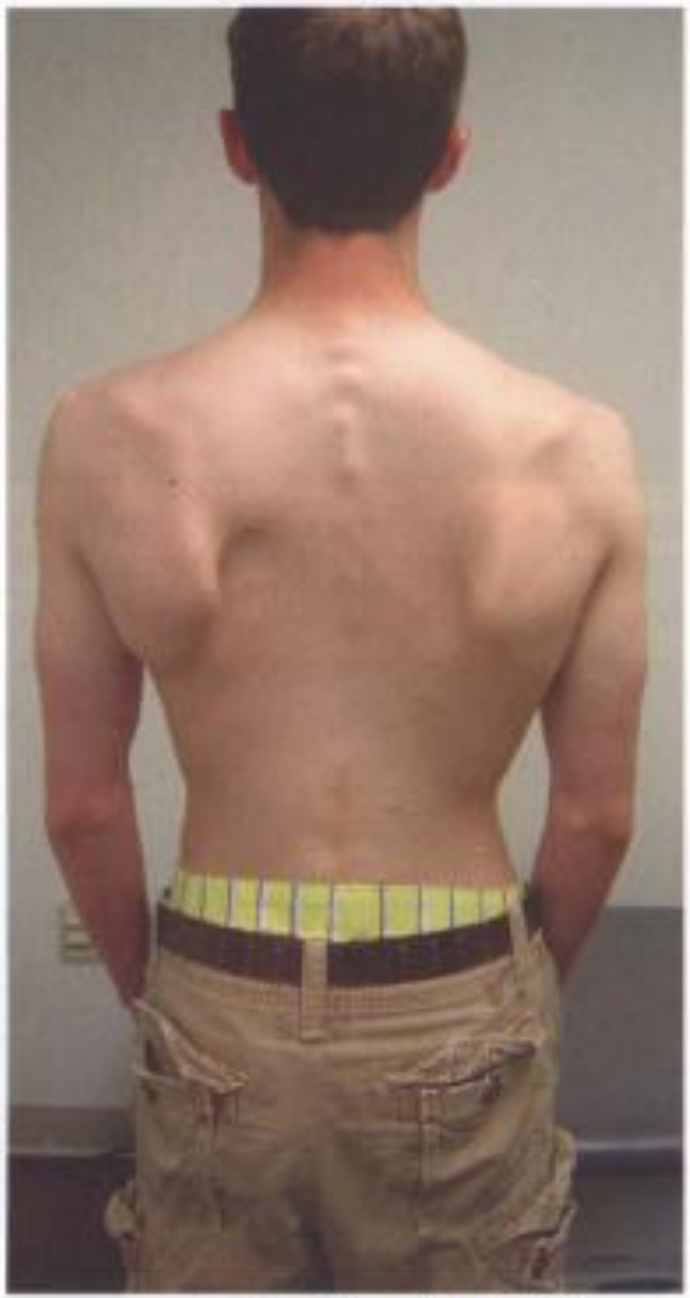

Figure 4-11. Thoracic lordosis.

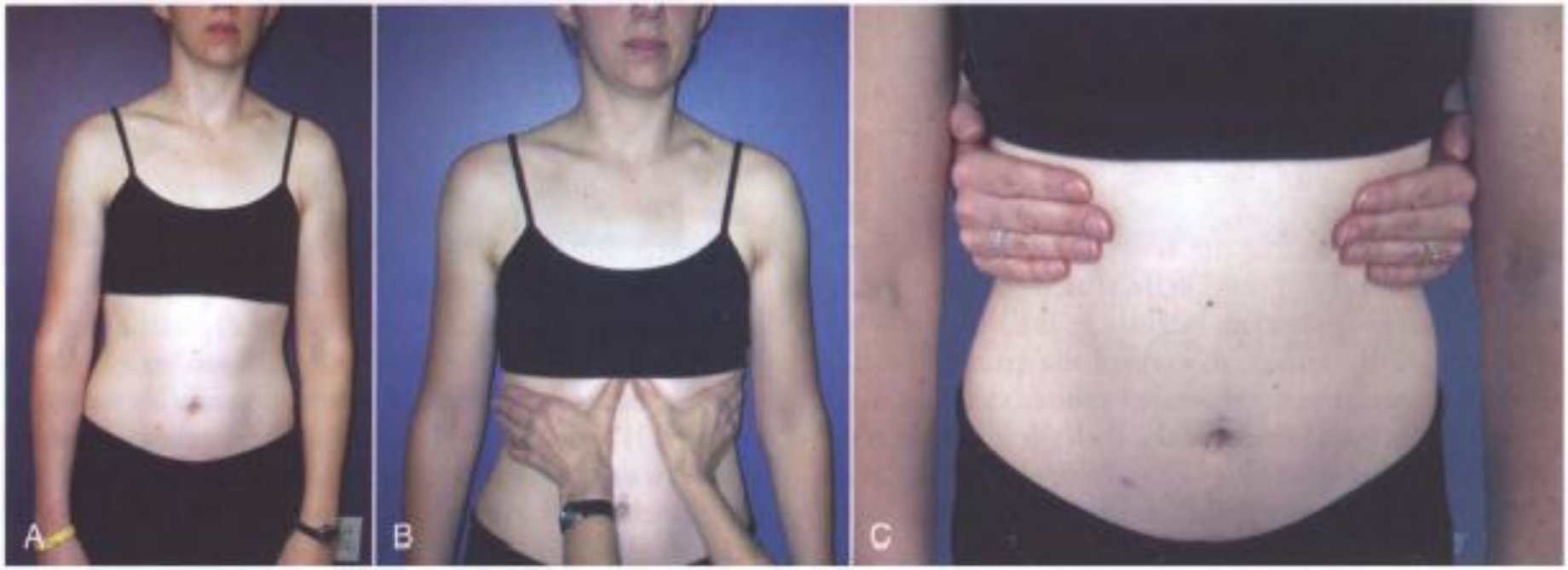

Figure 4-12. Asymmetrical rib cage. **A,** Slight appearance and asymmetry. Note arm position in relation to rib cage and pelvis. **B,** Right side of rib cage more prominent than left. **C,** Another method demonstrating right rib cage prominence.

Figure 4-13. Postural scoliosis with right rotation of rib cage.

Figure 4-14. Throwing motion associated with right rotation.


B

Figure 4-15. Structural scoliosis. **A,** Right thoracic convexity and left lumbar convexity. **B,** X-ray of similar curvature. **C,** Forward bending demonstrating left lumbar convexity.

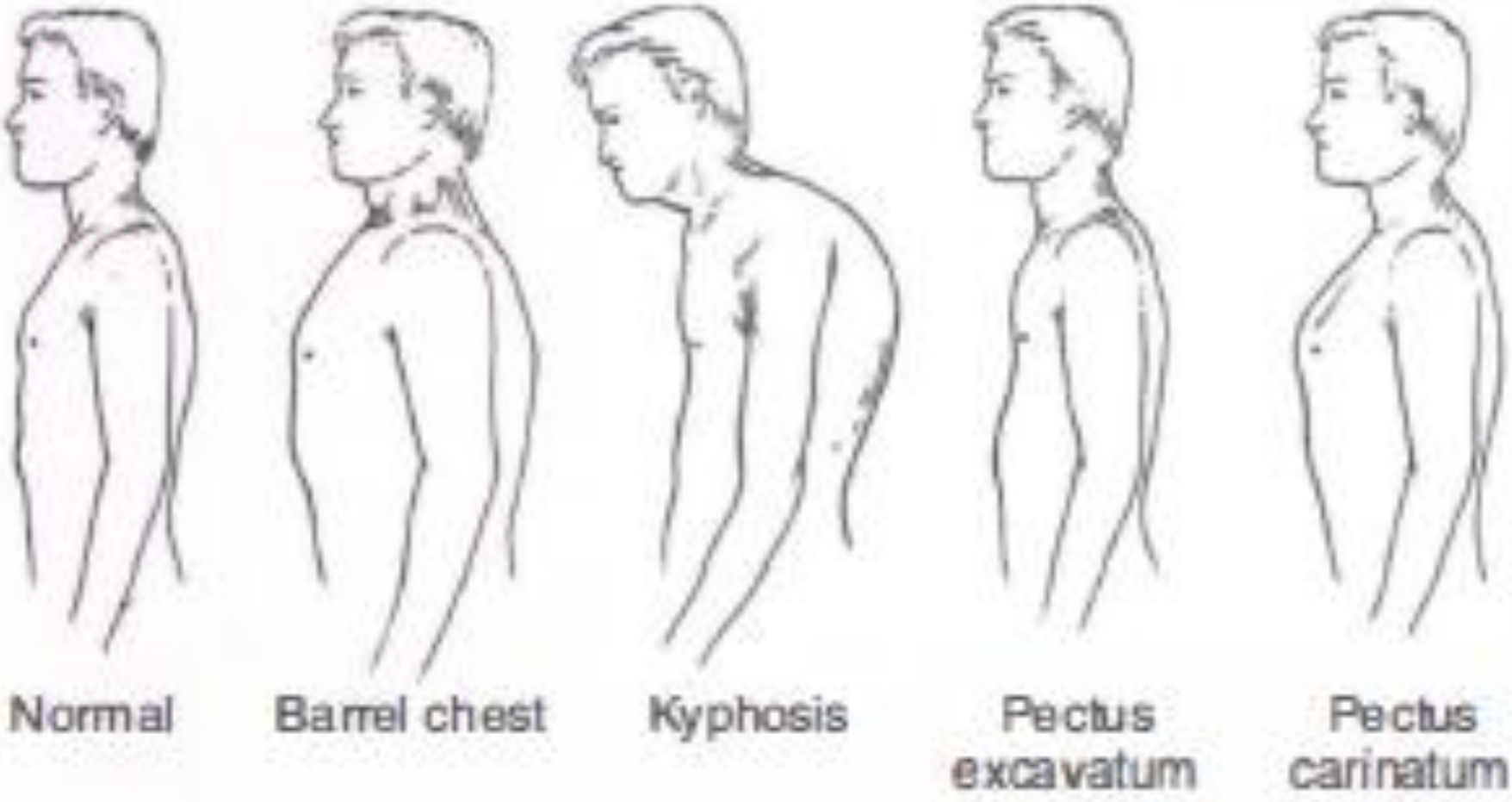

Figure 4-16. Variations in trunk shape. (From Frownfelter D, Dean E: *Cardiovascular and pulmonary physical therapy*, ed 4, St Louis, 2006, Mosby.)

Figure 4-17. Kyphosis, sitting with lumbar support.

Figure 4-18. Kyphosis, sitting without lumbar support.

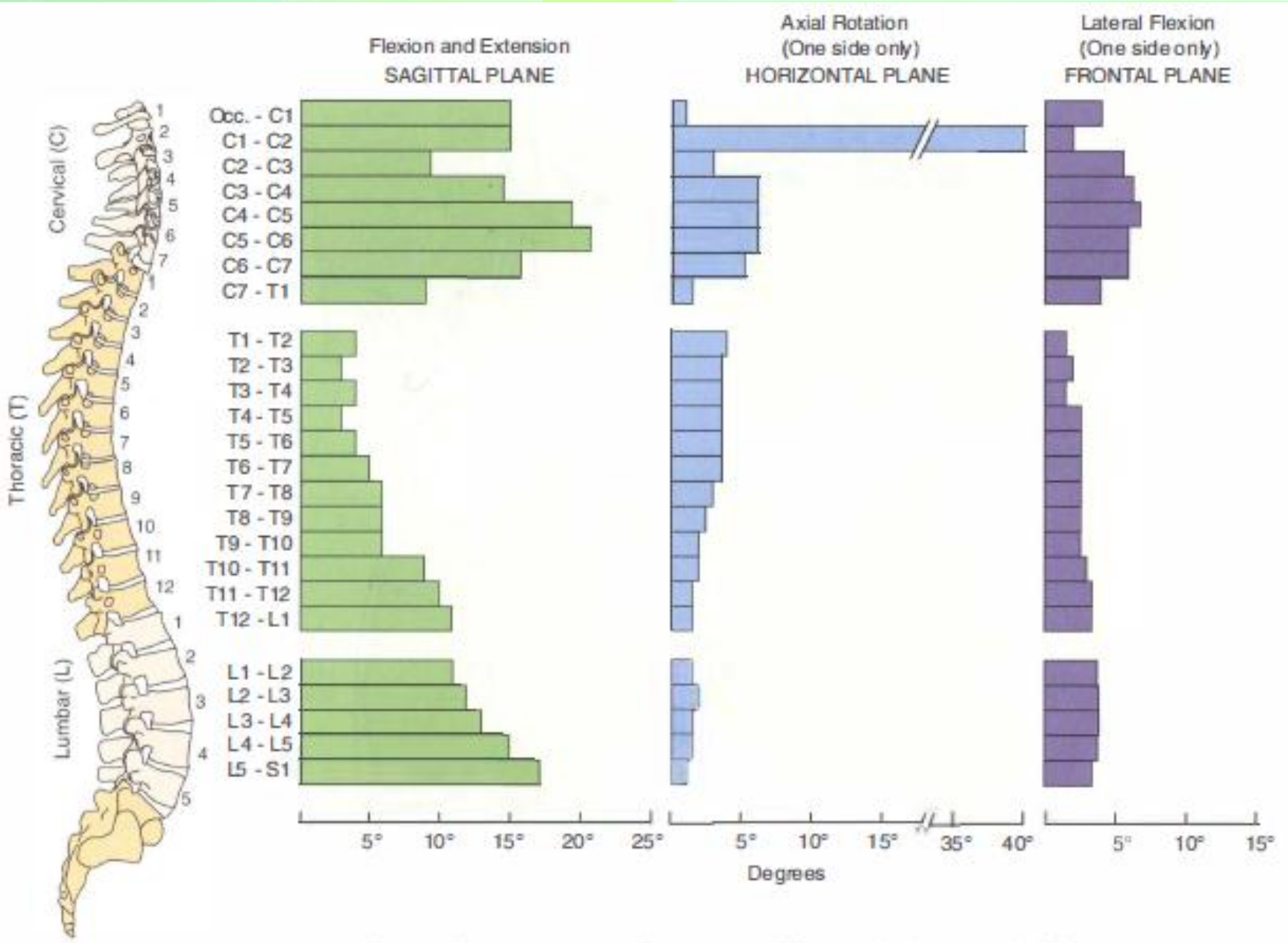

Figure 4-19. Distribution of motion across each segment of the spinal column. (Styled after White AA, Panjabi MM: Kinematics of the spine. In White AA, Panjabi MM, eds: *Clinical biomechanics of the spine*, ed 2, Philadelphia, 1990, Lippincott. In Neumann, DA: *Kinesiology of the musculoskeletal system: foundations for rehabilitation*, ed 2, St Louis, 2010, Mosby.)

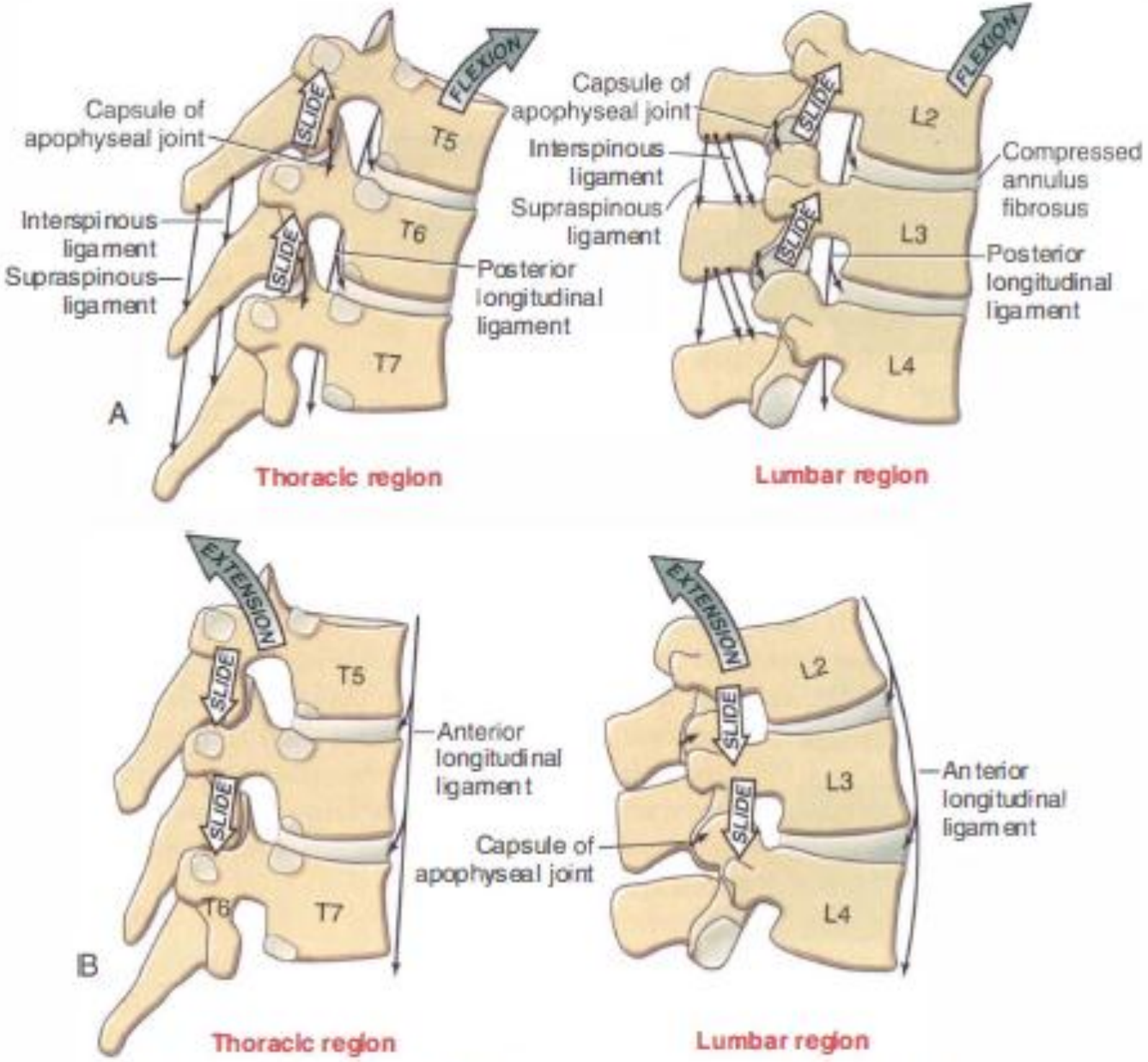

Figure 4-20, **A,** Thoracic flexion. **B,** Thoracic extension. (Modified from Neumann, DA: *Kinesiology of the musculoskeletal system: foundations for rehabilitation*, ed 2, St Louis, 2010, Mosby.)

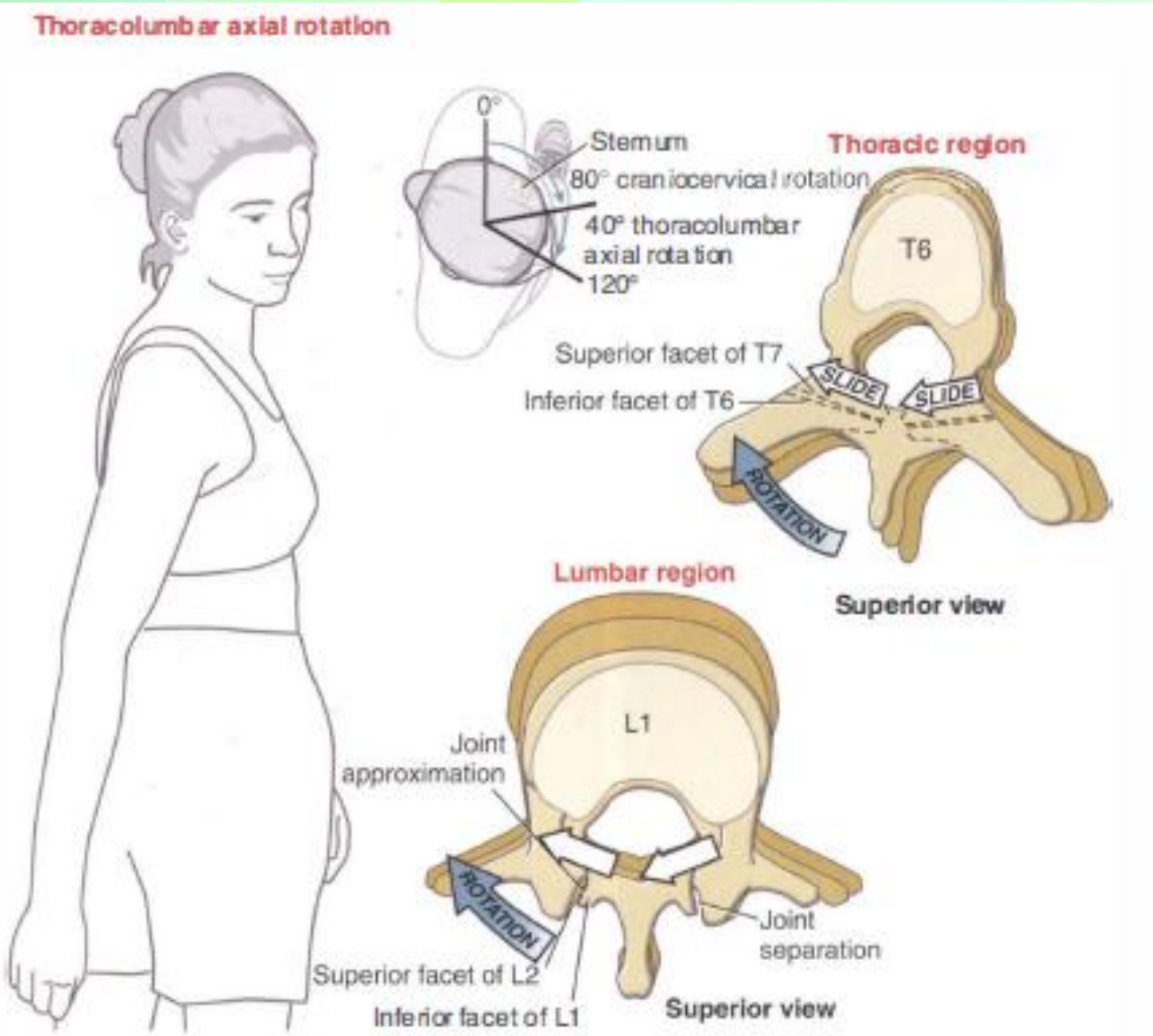

Figure 4-21. Rotation. (From Neumann, DA: *Kinesiology of the musculoskeletal system: foundations for rehabilitation*, ed 2, St Louis, 2010, Mosby.)

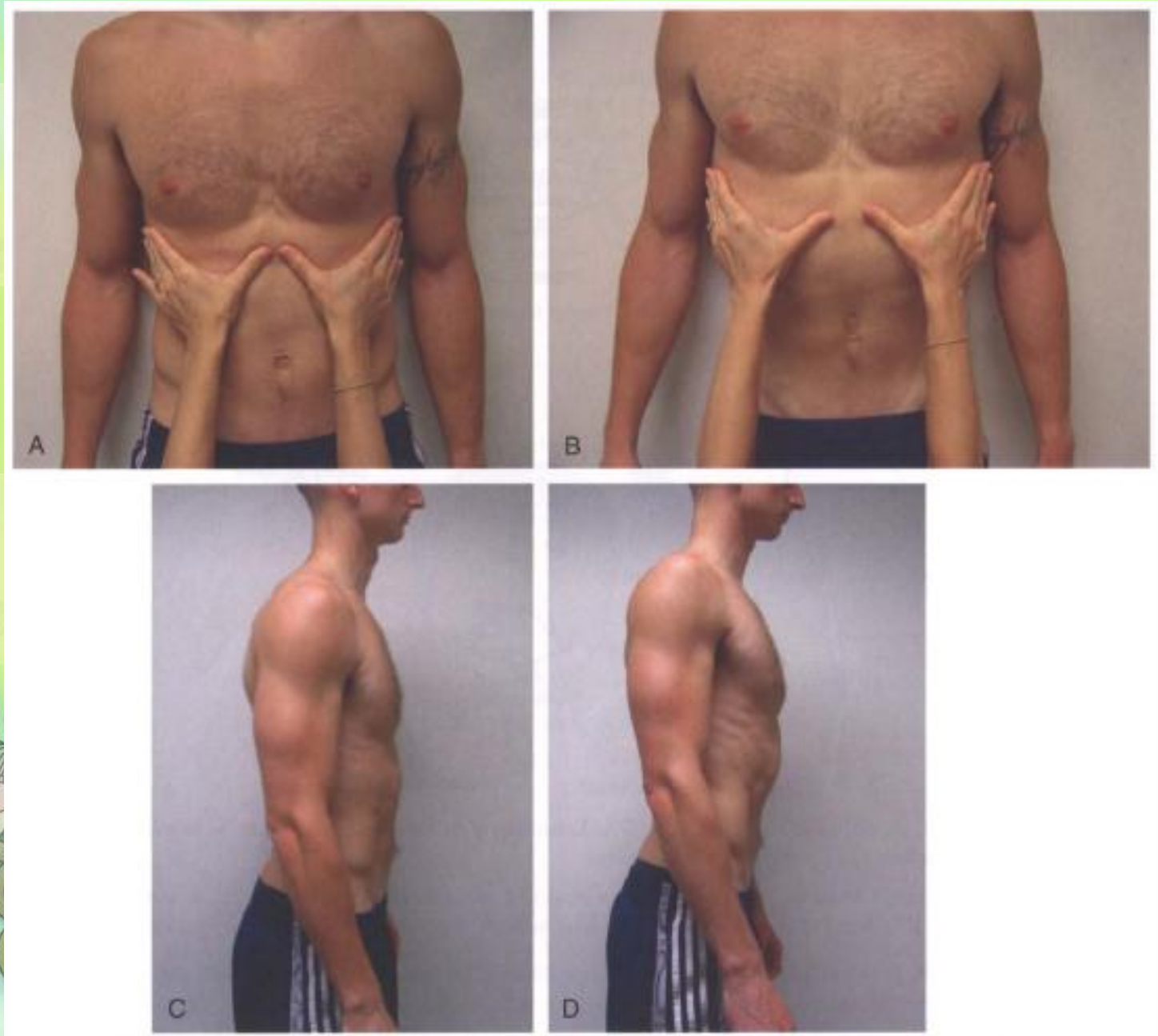

Figure 4-22. Ventilation. Four views: **A,** Subcostal angle at rest. **B,** Subcostal angle with inhale. **C,** Side view at rest. **D,** Elevation of rib cage with inhale.

Figure 4-23. Exaggeration of the curves in the thoracic and lumbar spines. (From Kendall FP, McCreary EK, Provance PG: *Muscles: testing and function*, ed 4, Philadelphia, 1993, Lippincott Williams & Wilkins.)

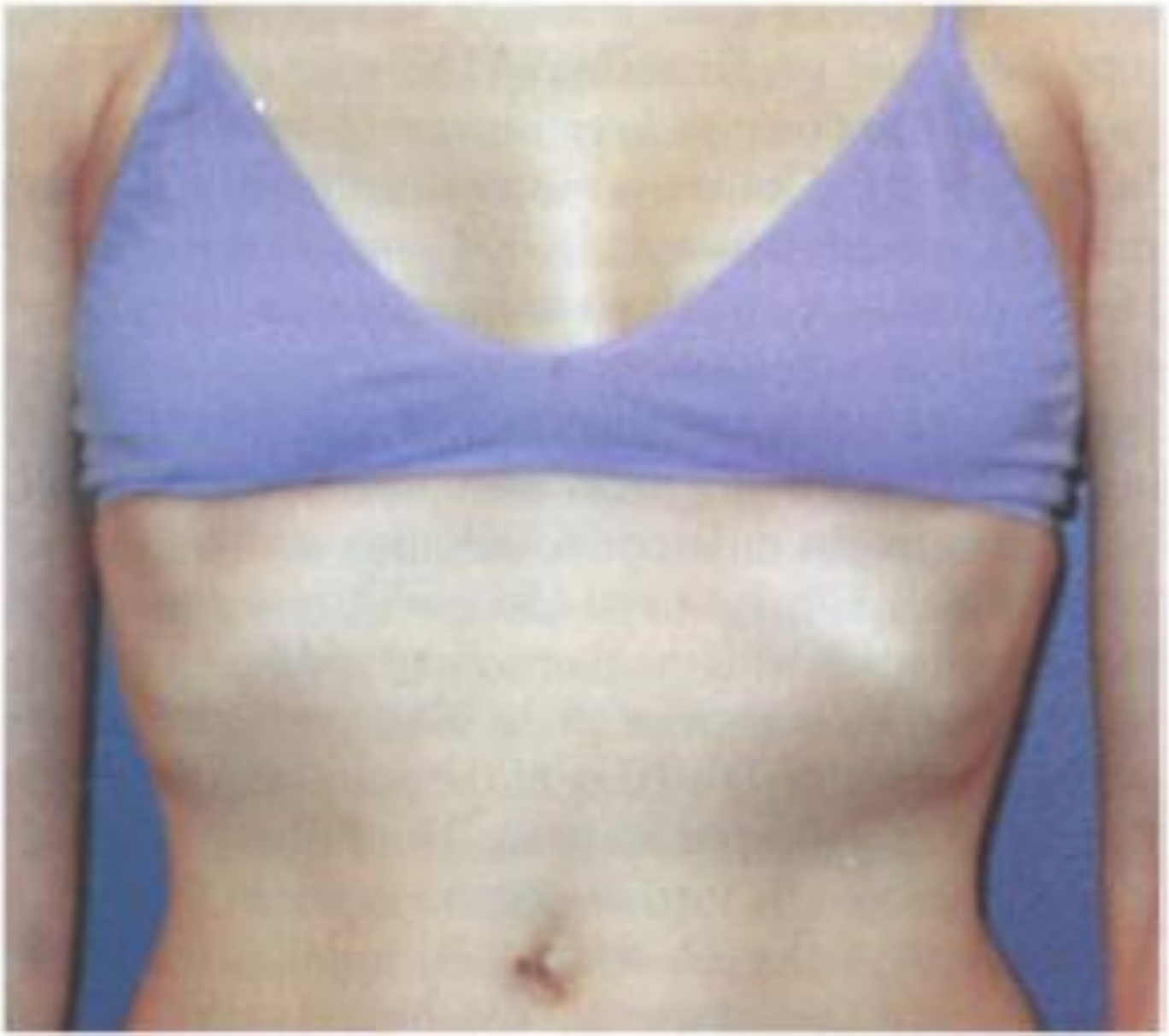

Figure 4-24. Left subcostal margin would be closer to midline than the right.

Figure 4-25. Length of the oblique musculature can be assessed further by observing the movement of the rib cage and subcostal angle with inhalation and full-arm elevation. **A**, At rest with narrow subcostal angle. **B**, With inhalation, the angle widens. **C**, Inhalation with arms over the head. The angle does not widen as much as with arms at side.

Figure 4-26 Kyphosis-lordosis.

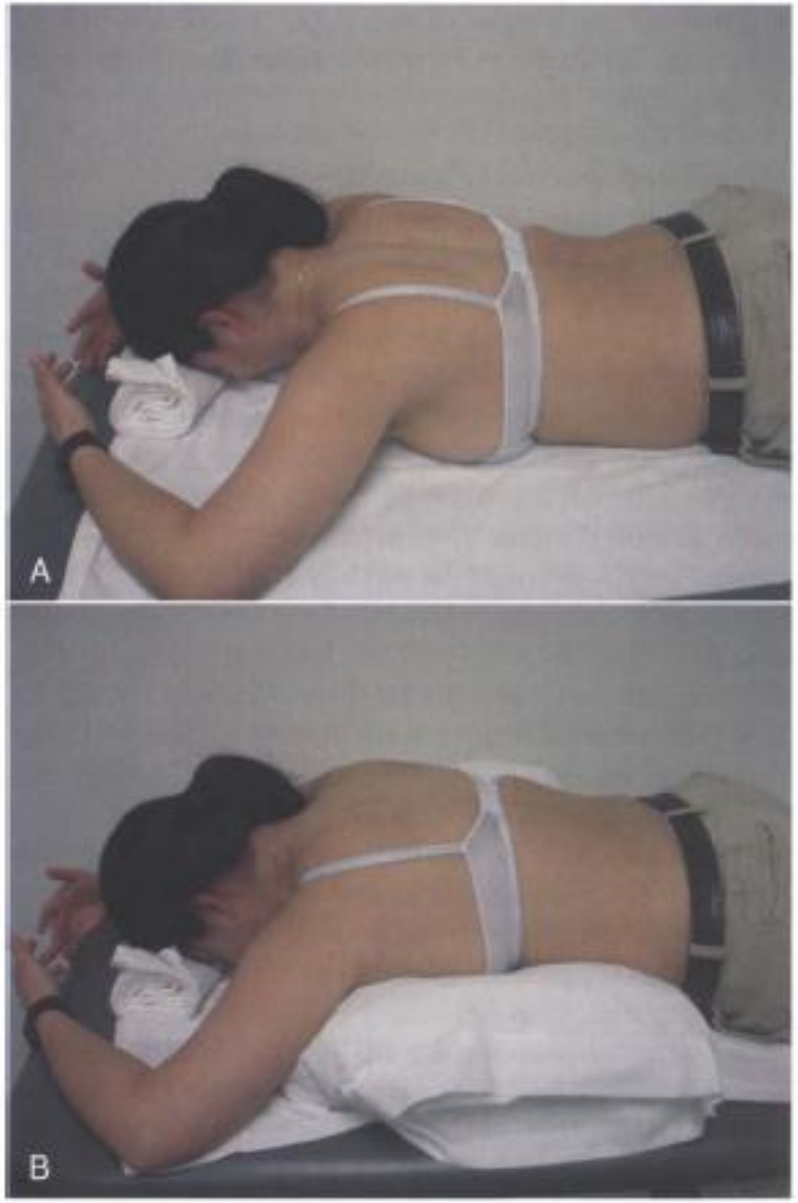

Figure 4-27. Starting position for prine arm lifts. **A**, Insufficient support under thorax allows thoracic extension. **B**, Increased support places thoracic spine in more ideal alignment.

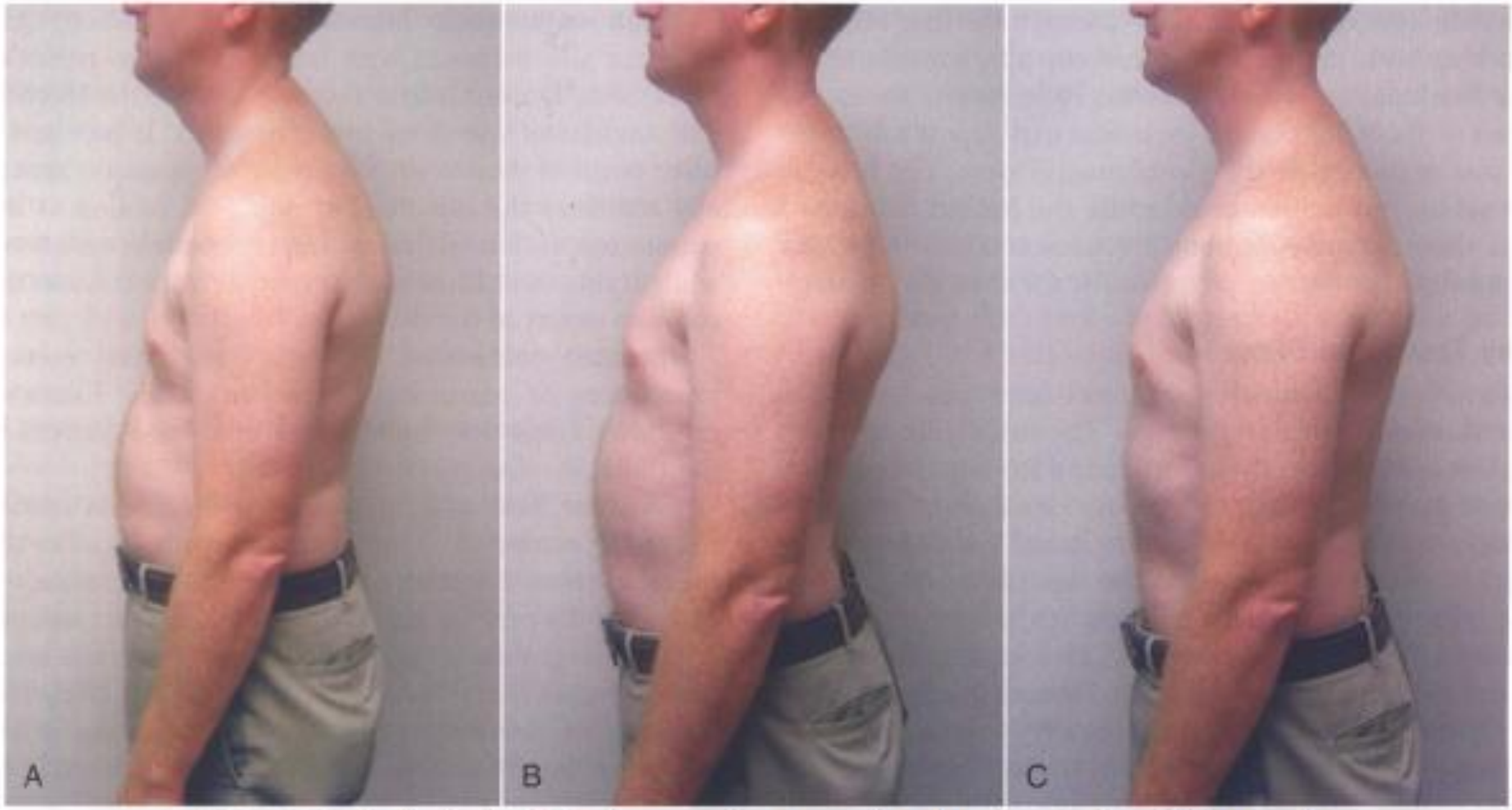

Figure 4-28. **A,** Kyphosis. **B,** Lumbar extension greater than thoracic extension. **C,** Improved thoracic alignment without lumbar extension.

Figure 4-29. Back to wall shoulder flexion.

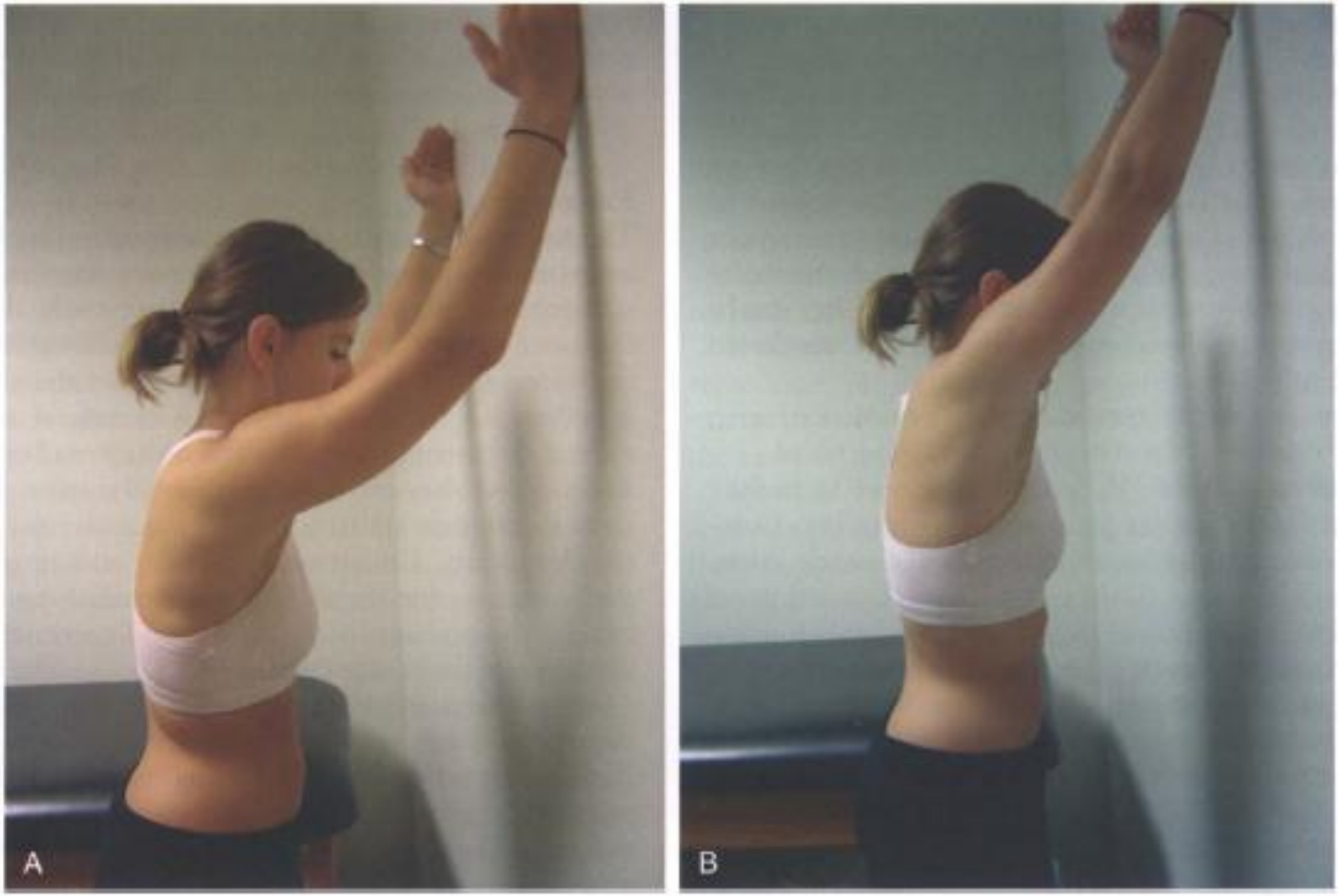

Figure 4-30. **A,** Sliding hands up the wall to perform shoulder flexion. **B,** At maximum flexion, the patient lifts the hand off the wall by posteriorly tilting and externally rotating the scapula.