

Subcostal muscles

The thorax contains vital structures that enable such functions as breathing to occur. Its major muscles are the thoracic wall and upper limb muscles as well as the diaphragm.

Anterior thoracic wall muscles include:

- **External intercostal muscles:** eleven on each side between the ribs. Pass from rib to rib and run at right angles to the fibers of the internal and innermost muscles. Continue toward sternum as the **external** intercostal membrane. They **raise the ribs during inspiration**.
- **Internal intercostal muscles:** eleven on each side between the ribs. They continue toward the vertebral column as the posterior intercostal membrane. They **depress the ribs during expiration**.
- **Innermost intercostals:** run in the same direction as internal intercostals but are separated from them by nerves and vessels. Action unknown but probably the same as internal intercostals.
- **Subcostal muscles:** originate on the inner surface of each rib near the costal angle and insert on the inner surface of the first, second, or third rib below. They **raise the ribs during inspiration**.
- **Transverse thoracic muscles:** attach the posterior surface of the lower sternum to the internal surface of costal cartilages 2 through 6. These muscles pull the **ribs downward during expiration**.

Remember: The **diaphragm** is the main muscle of inspiration. It is innervated by the **phrenic nerve**. The **intercostal** muscles are mainly active during forced respiration. During quiet breathing these muscles increase tonus, allowing for the thoracic wall to remain rigid without producing movement. These muscles are innervated by their corresponding **intercostals nerves**.