

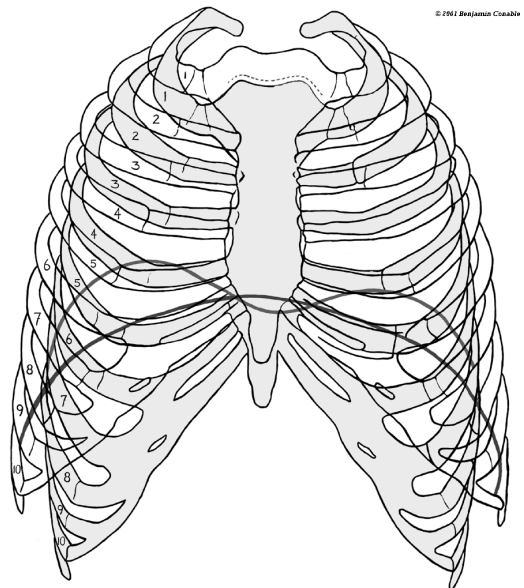
## Ribs Are Not a Cage

Language is powerful. We usually define a cage as a confining structure. If we consciously or unconsciously think of our ribs as a cage, as we might if our map of the ribs is incorrect, rib movement will be limited. Remove the word “cage” from your idea of ribs and begin to experience more freedom of rib movement right now.

Inside the ribs and above the diaphragm, are the two lungs and heart. This is the thoracic area in the upper third of the torso. We usually have 24 ribs, 12 on each side of the body. In the back, each rib attaches by articulations (joints) with the thoracic spinal vertebrae. Most ribs have articular surfaces with two vertebrae. These articulations are made for lots of movement. On our front, the ribs join the sternum via cartilage. By nature this cartilage is meant to be flexible, allowing rib excursion out to each side, increasing the circumference of the whole thorax, front to back and back to front.

Exploring all your ribs from the top down, notice the relative size, smaller at the top are the shortest and longer near the bottom. The last two ribs on each side are short again and termed “floating” because they only attach to the spine in back and do not come all the way around to the front. Be sure to explore the soft muscle tissue between the ribs, too.

Our lungs are passive structures and only fill with air when the ribs, diaphragm, and spine move. Rib movement is done primarily by two sets of intercostal muscles. On inhalation, the external intercostals help swing the ribs up and out like bucket handles, while on exhalation the internal intercostals assist the ribs on their downward and inward excursion.



There is a vacuum in the pleural space between the lungs and the chest wall. The movement of the ribs up and out on inhalation results in an expansion of the chest cavity, and a concomitant expansion of the lungs, increasing their internal space. This expansion draws air through the nose and/or mouth into the lungs. After the dynamic transition at the top of the inhalation, the ribs reverse direction for the exhalation, moving down and in, expelling air from the lungs.

The illustration above, though in two dimensions, shows the ribs at rest at the end of an exhalation (narrow) and up and out on inhalation (wide). The two black lines that dome up from the bottom sides of the ribs represent the diaphragm contracted and at rest.