The diaphragm is a dome-shaped muscle that forms a seal around the bottom of the rib cage.

This seal separates the thoracic and abdominal cavities with several openings for blood and lymph vessels, nerves, and structures of the digestive system. The muscle fibers of the diaphragm form a ring around the bottom of the rib cage and converge in the center to form the central tendon. It is helpful to visualize the diaphragm like an umbrella opened at the bottom of the rib cage. The muscle fibers correspond with the domed fabric and the central tendon is similar to the handle.

The diaphragm is the primary muscle of breathing. As it contracts, the central tendon is pulled down toward the abdominal cavity. The dome then flattens, increasing the space inside the thoracic cavity and decreasing its internal air pressure. Decreased air pressure within the cavity prompts air to flow inward from outside the body (inhalation) to equalize air pressure. This mechanism is how the lungs fill with air. As the diaphragm relaxes, the muscle relaxes upward and returns to its domed shape, decreasing the space within the thoracic cavity. Increased pressure within the thoracic cavity prompts air to flow out of the lungs (exhalation), again equalizing air pressure.

**DIAPHRAGM**

**Attachments**
- Origin: ribs 7-12, inner surfaces and costal cartilages, xiphoid process of sternum, and bodies of L1-2
- Insertion: central tendon

**Actions**
- Expands thoracic cavity during inhalation

**Innervation**
- C3-5
- Phrenic nerve
Contraction and relaxation of the diaphragm drives breathing when the body is relaxed. Other muscles such as the intercostals, subcostales, and serratus posterior muscles are activated to increase the depth of breathing. The scalenes, quadratus lumborum, and pectoral muscles may also contribute to forceful inhalation. Increasing the pliability, kinesthetic awareness, and recruitment of the diaphragm helps decrease tension in these other muscles. Respiratory pathologies such as chronic obstructive pulmonary disease (COPD) or asthma, smoking, heavy cardiovascular exercise, postural deviations, and abnormal breathing patterns associated with physical and emotional trauma often lead to overuse of these accessory breathing muscles.

PALPATING DIAPHRAGM
Positioning: client supine
1. Stand at client’s side facing the abdomen and locate the bottom edge of the anterolateral rib cage with the fingertips or pad of the thumb.
2. Slide fingertips/thumb inferiorly, onto the bottom edge of rib cage.
3. Locate the fibers of the diaphragm by gently sliding under and following the inner surface of the rib cage.
4. Instruct client to inhale to assure proper location. m&b

Client Homework—
Diaphragmatic Breathing
1. Lie on your back in a comfortable position.
2. Place your hands on your belly, just below your rib cage, and breathe slowly in through your nose and out through your mouth.
3. Focus on making your stomach rise against your hand as you breathe in. Your chest should remain as still as possible.
4. Breathe out through pursed lips, allowing your stomach to fall inward as the diaphragm relaxes.
5. Continue relaxed breathing, feeling the belly rise and fall as the chest remains still. This exercise optimizes breathing patterns, increases relaxation, and stimulates the immune system.

Editor's Note: The Client Homework element in Functional Anatomy is intended as a take-home resource for clients experiencing issues with the profiled muscle. The stretches identified in Functional Anatomy should not be performed within massage sessions or progressed by massage therapists, in order to comply with state laws and maintain scope of practice.