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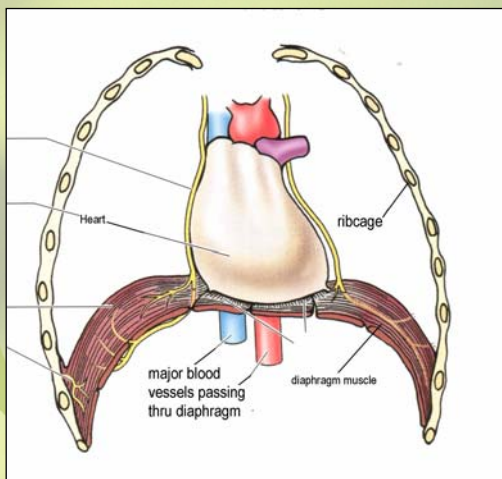
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## DIAPHRAGM (thoracic)

MARCH 2008 NEWSLETTER

Breathing is such an important function, not only for living, but for relaxing the mind and body. I'm constantly reminding people to "breathe!" during their massage, and to practice deep breathing in their daily life! Since the diaphragm is our primary breathing muscle, this was a relevant and really fun topic to review and research again -- what a very cool muscle the diaphragm is! A general definition of a diaphragm is any "dome shaped dividing structure". It is typically a thin flattish disc with a convex side and a concave side (like a contact lens). It can be membranous, soft and flexible, and is used to separate two structures, either barricading or regulating the flow of light, sound, fluid or pressure. There are many different applications of a diaphragm, such as contraception, optics/photography, acoustics, and a whole variety of uses in mechanical and structural industries.



The thoracic diaphragm is the numero uno muscle of respiration in the human body, and sits in the ribcage with the convex side facing up towards our head, and the concave side facing toward our feet. A thin dome-like muscle, it separates our thoracic cavity (containing lungs & heart) from our abdominal cavity (containing stomach, intestines, liver, spleen, pancreas, gallbladder, kidneys etc.). The heart sits on top of the diaphragm in the centre, and is surrounded by the lungs on either side. When you inhale to breathe, the diaphragm contracts by flattening out the concave side and pushing down on your abdominal contents. This changes the volume and pressure between the thorax and abdomen, creating a vacuum effect and inflating the lungs. Upon exhaling, the diaphragm relaxes, the volume and

pressure between the cavities change again, and air whooshes out of the lungs. The diaphragm is also an important muscle for abdominal straining. It assists the anterior abdominal muscles in raising intra-abdominal pressure during urination, bowel movements, child birthing, and heavy lifting.

A slumped head-forward posture, anxiety, chest breathing, and unaccustomed over-exertion in breathing can cause trigger points in the diaphragm, causing a "stitch in the side" pain just under the bottom ribs, typically with exhaling (also shortness of breath). Fortunately, it is possible to treat peripheral knots in the muscle attachments to the underside front of the ribs, and even this is a huge benefit in releasing the general tension on the whole muscle. During normal breathing, your stomach should expand in and outward, NOT your chest! If you're striving to keep your stomach flat for the sake of appearances, you're hampering the mechanics of natural breathing. Habitual breathing with the chest severely taxes your neck muscles, and can lead to various problems, such as nerve compression. Other things you can do? Quit smoking and do what you can to inhibit a chronic cough if you have one.

**Happy deep breathing in April when spring arrives!**

- Do you recall eating too much at a holiday feast and finding it almost painful to breathe, especially deeply? That's your diaphragm pressing down on your poor overstuffed stomach!
- The actions of the diaphragm pushing down on the abdomen are also important for general circulation of the body, as it helps to return venous blood to the heart.
- If the diaphragm is struck, or otherwise spasms, breathing will become difficult. This is called "having the wind knocked out of you." This happened to me while running thru the woods as a kid, and tripping over a log. I landed hard & flat on my front and couldn't breathe in for seemed an eternity!
- A hiccup occurs when the diaphragm contracts periodically without voluntary control.