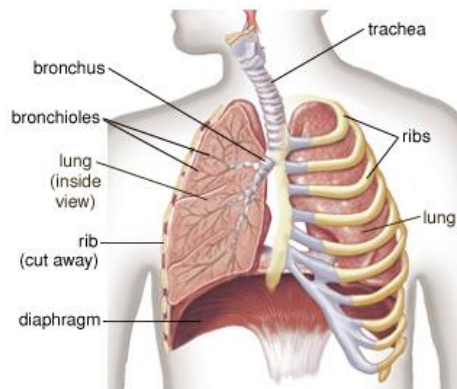
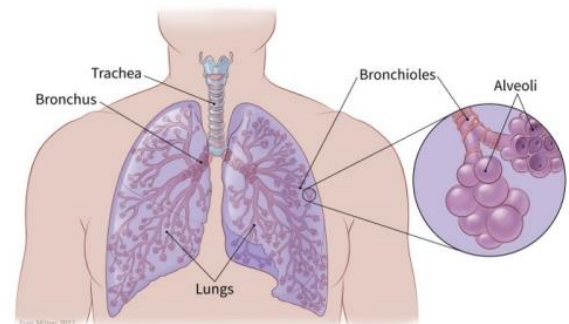


# Asthma

According to the Center for Disease Control, 1 in 13 in the U.S. have asthma, which works out to more than 26 million Americans. Asthma affects 8.3% of the adult US population, as well as 8.3% of children. So what is asthma?

Let's start off with the basics of lung function which is, of course, to exchange oxygen from the air with carbon dioxide produced by body tissues. Air enters the trachea and is distributed to progressively smaller airways which are surrounded by smooth muscle. From these smaller airways (bronchioles), air moves into small sacs (alveoli) where the transfer of gasses takes place.



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Distribution of fresh air is controlled by the movement of the diaphragm - a muscle composed of two flattened domes separating the lungs and heart from the abdomen - and also by the opening or closing of the bronchioles. The muscle fibers around the bronchioles are under control of the autonomic nervous system which can cause them to contract - attenuating the flow air into and out of regions of the lungs - or expand, increasing the flow of air. Fascia, the connective tissue that surrounds all structures in the body, also surround these bronchioles.

Asthma is characterized by hyper-responsiveness of the airways to irritation – whether cold air, smoke, dust or other allergens. The irritation causes the smooth muscles around the airways to constrict disproportionately, cutting off the flow of air. The irritants also cause inflammation of the airways leading to thickened mucous which can plug the now smaller passages. I believe that, as the lungs become inflamed, the fascia becomes “sticky” and adheres to the bronchioles it surrounds, inhibiting normal motion of lung tissue. This further decreases the ability of the lungs to clear themselves of the thickened mucous by coughing. Air becomes trapped in lung spaces, increasing the amount of unused space, and decreasing the overall functional space of the lung.

When the body senses a need for increased oxygen, the “fight or flight” hormone – epinephrine - is released, which causes the smooth muscles to relax, opening the air ways. This is the same

hormone that is released when you are frightened. Since not being able to breathe is very scary, that seems appropriate. It becomes a problem, however, when a person still is unable to sufficiently oxygenate the blood. In asthma, elevated stress hormones can become a chronic state.

As asthma progresses, anatomy reflects the changes in lung capacity. The lungs become hyper-inflated with greater unused capacity, the rib cage expands, the diaphragm flattens, muscles in the neck and low back become tightened to anchor the ribs to reflect the lungs' hyper-inflated state.

The inhalers and drugs used to treat asthma either 1) counter the local effects of epinephrine, increasing the ability of the airways to remain open, or 2) reduce inflammation. These medications are variably effective, but do not directly address the more underlying issues of bronchial and rib cage constriction due to fascial strains, and the state of chronic "flight or fight" the individual maintains.

Osteopathic manipulation addresses the physical imprint of asthma, loosening the rib cage and diaphragm to allow greater ease in breathing. It can help reduce the increased stress hormones the body is producing by normalizing the sympathetic nervous system. Over time, I have had patients reduce their medication or even stop them altogether.