


**"PRI Breathing Mechanics  
in COVID Times"**

with Ron Hruska, MPA, PT  
Every Tuesday at 6PM CT



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**Week 3:  
Balancing Pleura Cavity Negative  
Pressure Through Ground Pressure**



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This week, I would like to help you understand how our feet can help our ability to breathe more easily and effectively, with both of our lungs and their corresponding diaphragm central tendons and pleura.




Illustration by Elizabeth Noble for the Postural Restoration Institute®  
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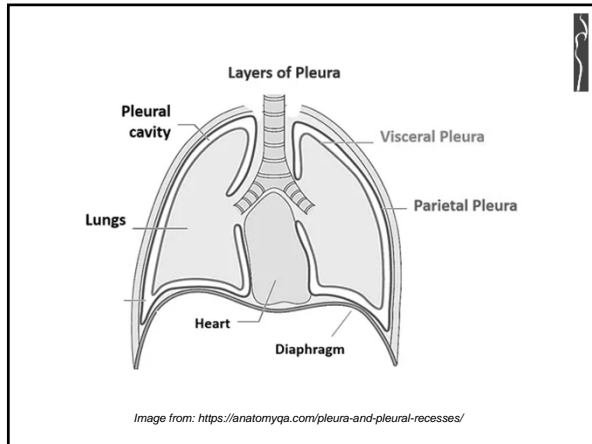
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When our diaphragms contract upon inhalation, our chest walls expand through mechanical pull of the diaphragm muscle attachment to the ribs.

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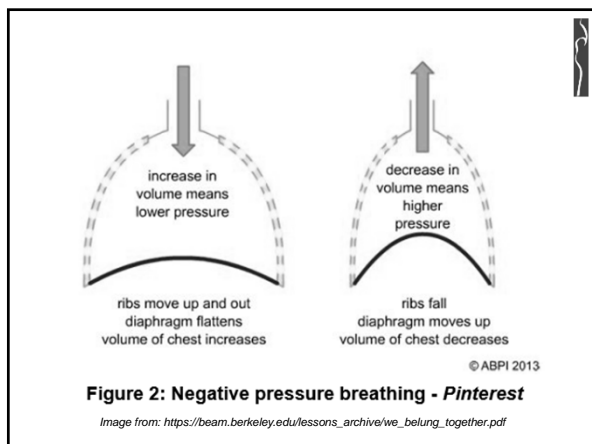
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**Figure 2: Negative pressure breathing - Pinterest**

*Image from: [https://beam.berkeley.edu/lessons\\_archive/we\\_be\\_lung\\_together.pdf](https://beam.berkeley.edu/lessons_archive/we_be_lung_together.pdf)*

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Corresponding negative intrapleural pressure that is simultaneously created, between the parietal pleura and the visceral pleura, "pulls" the visceral pleura and outside surface of the lungs toward the expanding chest wall.

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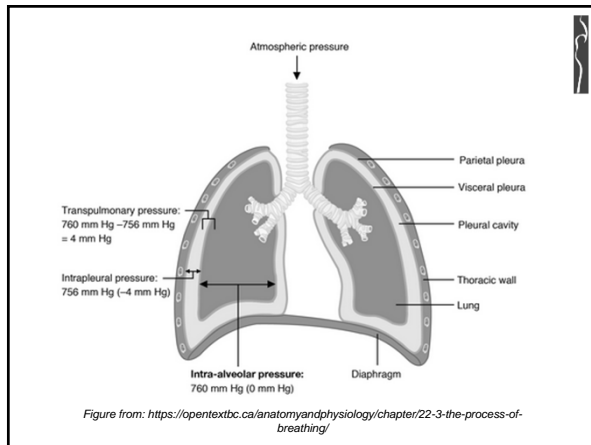
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Negative pleural cavity pressure, or "negative pressure" ventilation is mechanical ventilation in which negative pressure is generated on the outside of the chest and transmitted to the interior, to expand the lungs and allow air to flow in.

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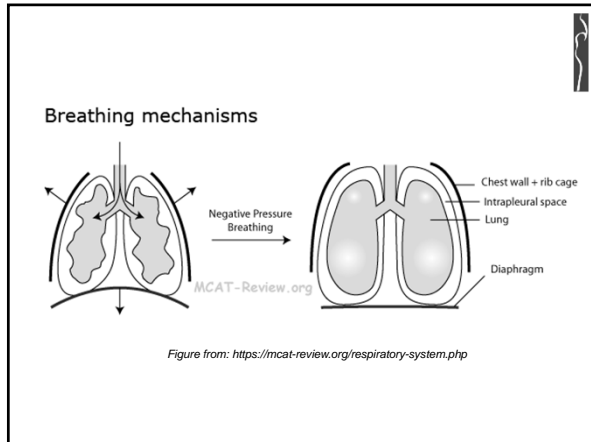
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With “positive pressure” ventilation, the transpulmonary pressure is increased by making the alveolar pressure more positive.

In contrast, with “negative pressure” ventilation, the transpulmonary pressure increased by making the pleural pressure more negative.

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Either way, air that is being pulled into the lungs, as a result of the increase in negative pleural cavity pressure, also assists with this chest wall expansion, by “pushing” the chest wall out in those areas where the negative pleural cavity pressure is not as high, because of low chest wall compliance or limitation that exists when one chest wall is more mal-positioned, twisted or tighter than the other.

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One of the best ways to maximize balanced, proportional and better symmetrical circumferential levels of negative pleural cavity pressure is to enhance 'push' from the ground up to stabilize and support the contraction of the two asymmetrical diaphragms for 'pull'.

The better one can generate push from the hamstrings, glutes, and abdominals, the better one can maximize bilateral balanced negative pleural chest pressure and optimize lung ventilation and perfusion.

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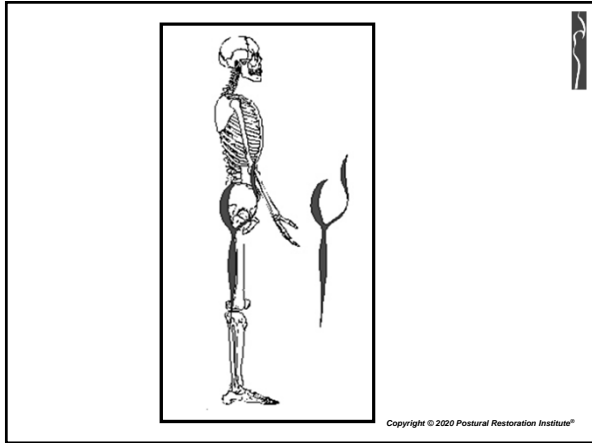
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### Lung Personality and Behavior

If our lungs could talk, they would tell you that they like these three things for proficiency:

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1. evenly distributed negative pressure that place them in ideal positions that give them the best ability to evenly expand both sides of the visceral pleura,
2. ground based push and lift that will enable them to provide the support for the shoulder blade and arm for forward reach and overhead activity that further assists with the development of negative pleural chest pressure related chest expansion and shoulder surface support, and
3. clockwise rotation and alternating counter-clockwise rotation for thorough perfusion and ventilation in the lower lobes of both lungs.

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Lungs are like twins.

They have separate identities and behaviors, because they are not “identical twins”.

They really are not ‘like-minded’ either.

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The right lung is more like a weight lifter, a construction worker, an assembly line worker, or a mechanic.

It is more of a ‘static position’ minded lung.

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The left lung is more like a singer, an actor, artist, painter, or dancer.

It is more 'dynamic' minded and is always willing to pass off the baton to the right lung when force is needed.

It also is the lung that needs more ground and overhead push to keep the left diaphragm leaflet more stable and secure for sufficient dynamic negative pleural cavity pressure.

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One activity that will assist in developing this cooperative lower ground (foot) based and upper ground (shoulder) based push for left negative pleural cavity enhanced breathing, is the *Standing Supported Left Glute Push* technique.

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**STANDING SUPPORTED  
LEFT GLUTE PUSH**



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This “standing” technique requires wearing shoes that provide good heel counter support, arch support and a toe box that will allow the toes and forefoot to easily spread out in the shoe.

You will also need to push a table next to a wall to prevent it from moving forward as you push it forward with your hands (or you could use a kitchen or bathroom counter in your home).

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This PRI technique is designed to place one in a Valsalva-like maneuver position between the exhalation and the inhalation phases, without blowing up a balloon and holding the expelled air or while pinching off the nose.

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In this technique, the force applied by the table and floor allow the tongue and mouth to close off the airway and properly use the abdominal muscles and the diaphragm to exhale and inhale without engaging the neck or back under moderate pressure created by closing off the pharynx with the pharyngeal muscle and the larynx/trachea with the tongue muscle.

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This voluntary control of the abdomen is maintained during the entire technique, without having to think about how to “hold” the contraction of the abdominals during both phases of the respiration cycle.

It is a wonderful way to teach someone how to inhale with good opposition to the diaphragm so that its effectiveness on opening up the mid and lower chest wall is maximized, as the subconscious effort of maintaining abdominal stabilization is minimized.

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The “support” of the upper extremities, offered by the stable table or counter, also allows one to lift the right leg up and the right foot off the floor as the left glutes “push” the body forward to further stabilize the lower trunk and pelvis as the right hip is raised up.



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This activity co-activates more integrative assistance from the right hip flexors, the right lower trapezius and long head of the triceps and left abdominal wall.

When all said and done, the tension and internal pressure created by the lengthened anterior shoulder and hip flexors enables one to breathe with the diaphragm under high compliance and forgiveness of lateral and posterior chest wall tension.

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This technique is, therefore, a good technique because the lateral, posterior, apical and base surfaces of both lungs can expand easily upon diaphragmatic contraction, secondary to chest wall compliance and the gravitational force displaced on the abdominal contents.



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The internal organs fall anteriorly and off the front of the thoracic and lumbar spine.

It is also an excellent postural drainage technique for the posterior lobes of the mid to lower lungs, preceding the standing positional induced coughing that more than likely will follow with those who are experiencing difficulty breathing because of fluid-filled aveolar sacs.

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Standing Supported Left Glute Push



Additional comments about the steps that follow the title and pictorial example, along with reasoning for the procedural steps, can be found on our website.

<https://www.posturalrestoration.com/community/post/6074/pri-breathing-mechanics-in-covid-times-webinar-recording-and-third-chest-wall-technique-reasoning?id=6074>

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In summary, this is an optimal position for the diaphragm to be in for coastal or mid to lower rib cage expansion upon contraction.



It also is a great position for one to sense the abdomen lift the abdomen up against gravity and feel how one's own body weight can serve as an element for abdominal strengthening with optimal diaphragmatic influence on the chest wall mechanics for ideal ventilation and perfusion at the anterior base of each lung's lower lobes.

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THANK YOU !



*We hope you will join us again next week!*

*Week 4:  
Regulating Lung Carbon Dioxide (Capnea)  
Through Postural End Range Deep Breathing*

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