Clarinet Breathing

Anatomy, Physiology, and Pedagogy

Presented By:

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International Clarinet Association:
ClarinetFest 2021

View the Handout at:

ica.alyssapowell.co

Overview:

- Advantages of addressing anatomy & physiology
- Introduction to anatomy & physiology
- Breathing pedagogy

How we Teach Breathing:

"The playing of low, soft tones on the clarinet is like a large, heavy road roller at work, smoothing out the freshly poured tar onto the roadbed. This machine is doing it's job powerfully, and yet is moving very slowly indeed. ...The air does not move rapidly, but still must move with great force."

-David Pino

"The tone should be produced in the same manner as one would use to blow out a candle from a distance..." -Daniel Bonade

"Blow from your diaphragm." -Michael Webster

Why use anatomy & physiology?

- Communication clarity (teacher ⇄ student)
- Specificity in application
- Recognize multiple methods
- Unity within the field
- Compare to voice pedagogy trajectory

Respiration: Anatomy & Physiology

- Skeleton
- Organs
- Muscles of inhalation
- Muscles of exhalation

Thorax & Clavicles

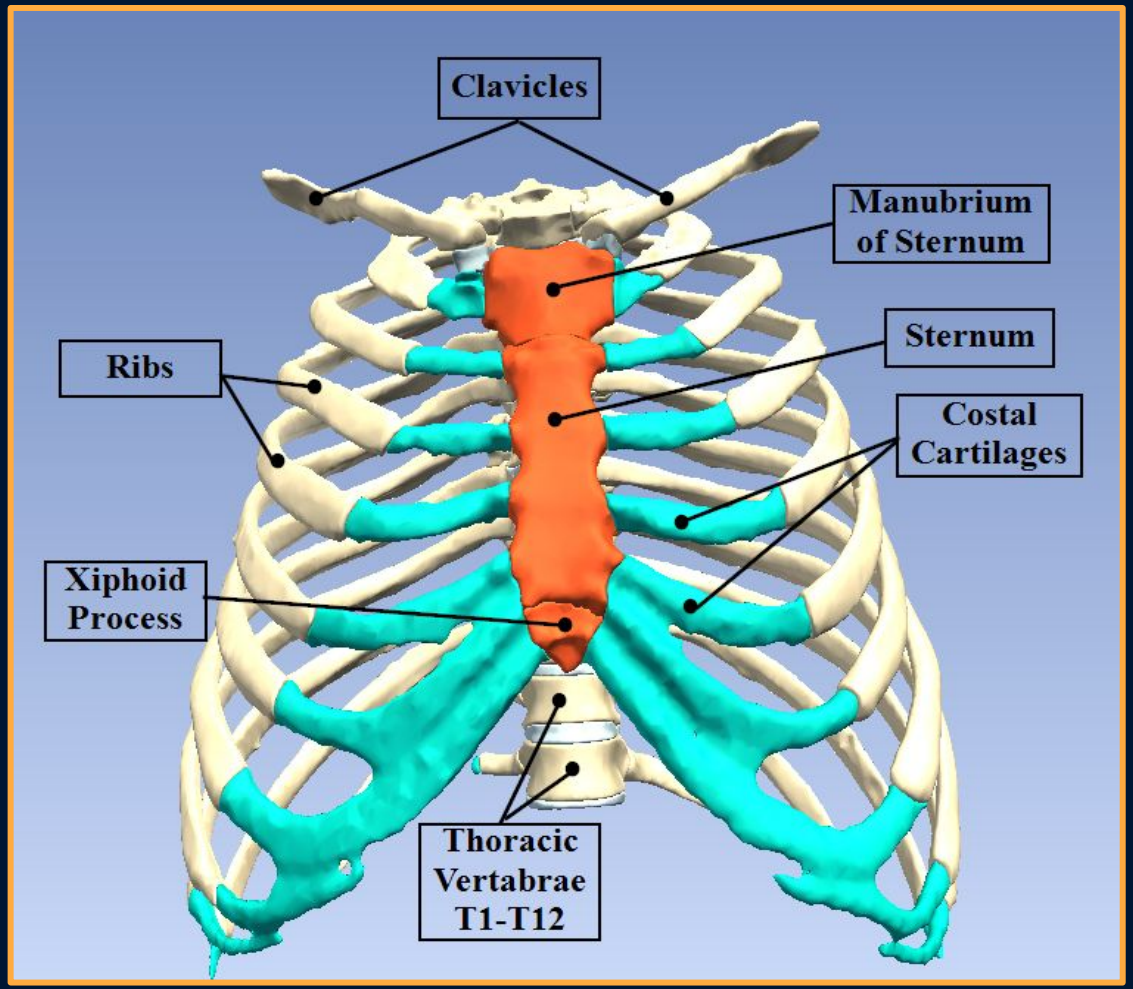

Image Courtesy of:
The Open Anatomy Project, Mauritanian Anatomy Laboratory Thoracic Atlas, January 2021. https://www.openanatomy.org/atlas-pages/atlas-mauritania-thorax.html
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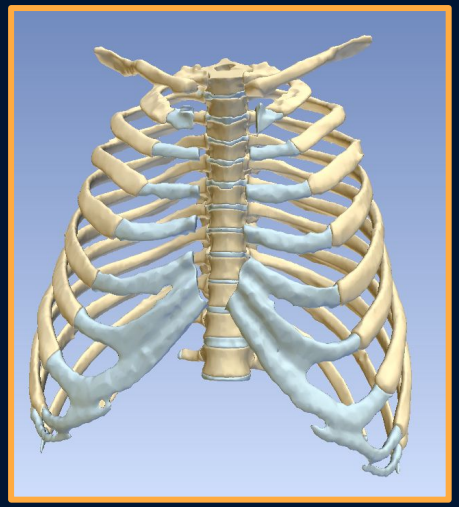
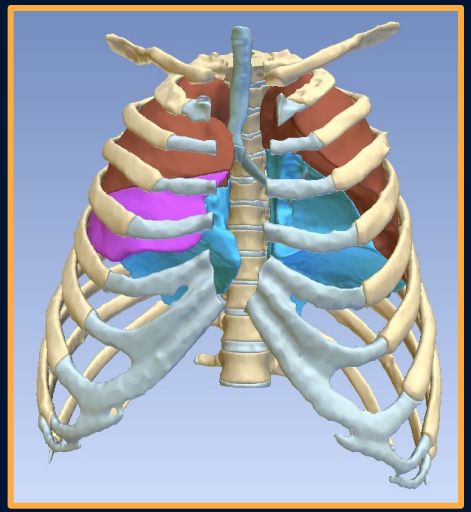
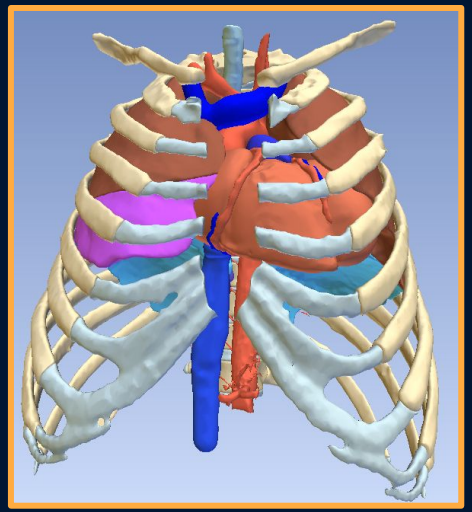
Organs in the Thoracic Cavity



Thoracic Cavity: Sternum removed



Thoracic Cavity: with lungs and trachea



Thoracic Cavity: Trachea, lungs, heart, pulmonary vessels

Images Courtesy of: **The Open Anatomy Project,** Mauritanian Anatomy Laboratory Thoracic Atlas, January 2021. https://www.openanatomy.org/atlas-pages/atlas-mauritania-thorax.html FREE AND OPEN RIGHTS. (Accessed May 29, 2021.)

The Lungs

- Organs
- Tissue made of millions of alveoli air sacs.
- Trachea connected to larynx
- Pleural membranes
- Boyle's Law

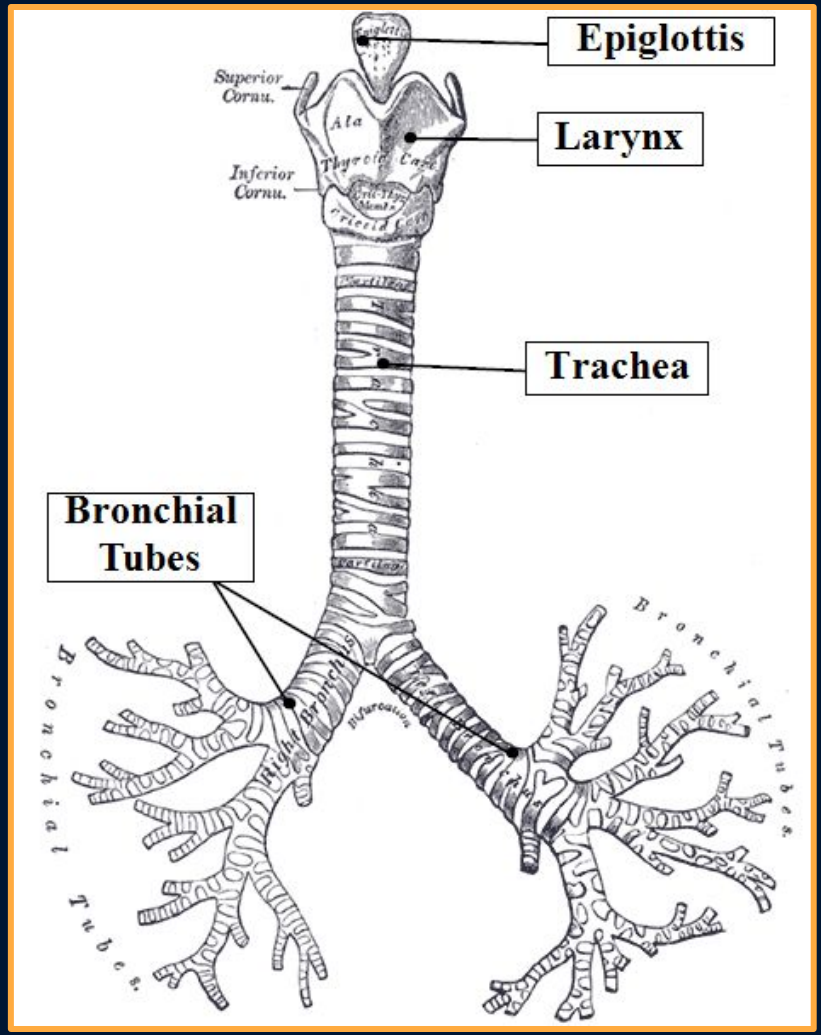


Image from Henry Gray's ***Anatomy of the Human Body*, Plate 961**, copyright 1918. PUBLIC DOMAIN. Wikimedia Commons, https://commons.wikimedia.org/wiki/Gray%27s_Anatomy_plates#/media/File:Gray961.png (Accessed May 29, 2021).

Boyle's Law

- Robert Boyle: 17th Century scientist
- In a closed container the VOLUME and PRESSURE are inversely related.
- As the volume INCREASES, the pressure DECREASES. This means the pressure inside is less than atmospheric pressure. Air flows to the space with less pressure.

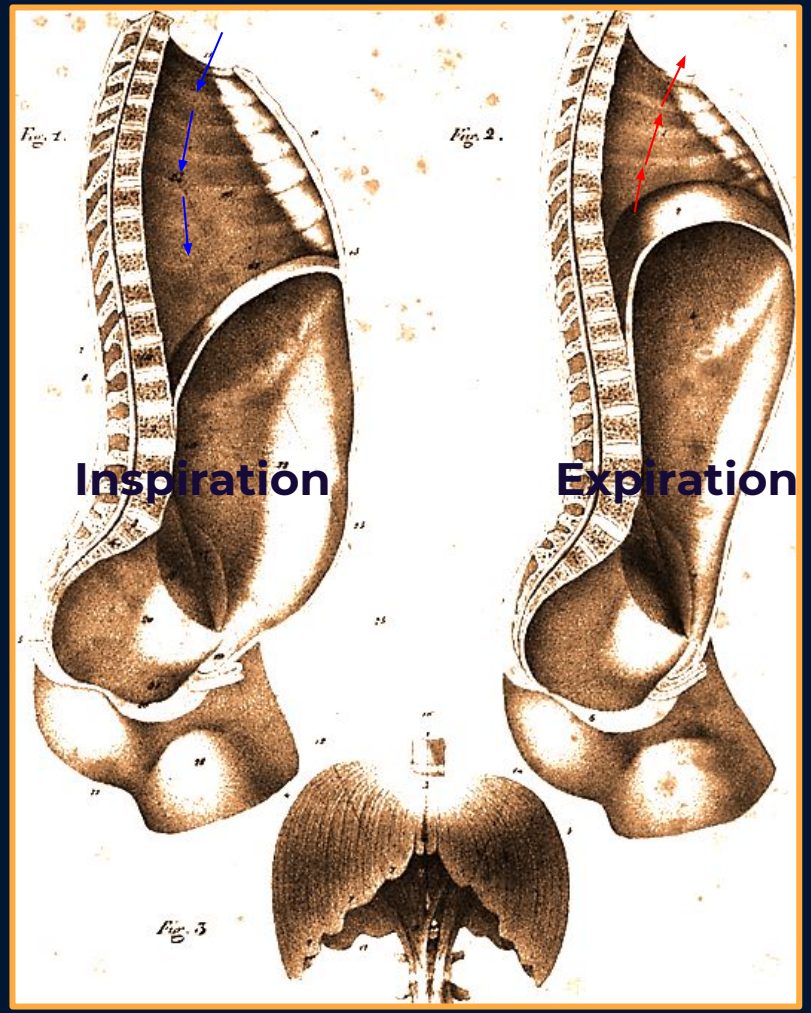


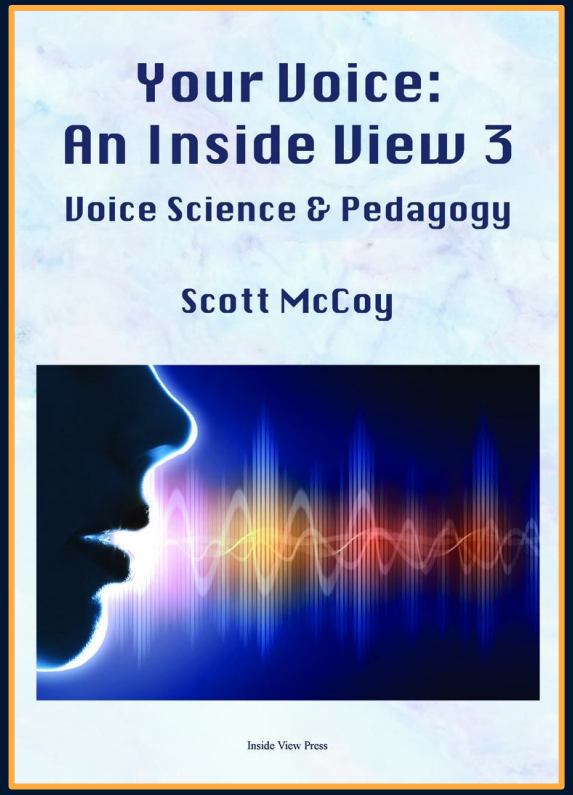
Image Courtesy of: **Google Books.** Manuel d'anatomie descriptive du corps humain, représentée en planches lithographiées by Jules Cloquet, publisher: Béchet Jeune, 1825. Artist: Pailloux PUBLIC DOMAIN IMAGE https://www.google.com/books/edition/Manuel_d_anatomie_descriptive_du_corps_h/58JNAAAAcAAJ?hl=en&gbpv=0 (Accessed May 29, 2021.)

Exhalation

What do we need?

- Steady
- Long duration
- Healthy

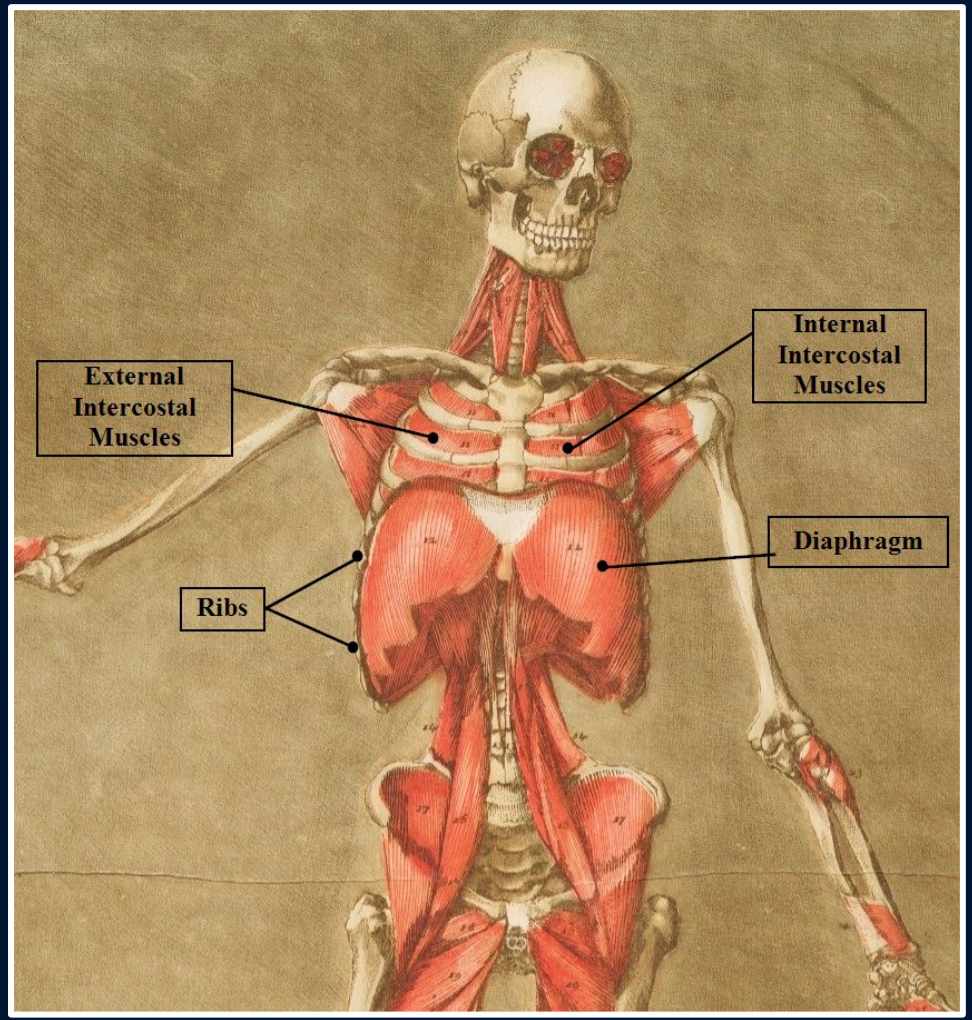
Learn from Voice Pedagogy



Dr. Scott McCoy,
Former Professor of Voice Science and Pedagogy, The Ohio State University

Excellent resource: *Your Voice: An Inside View*, 3rd Ed., Ohio: Inside View Press, 2019.

Primary Breathing Muscles



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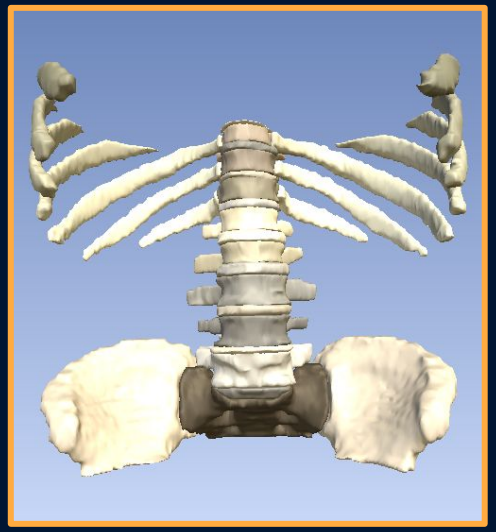
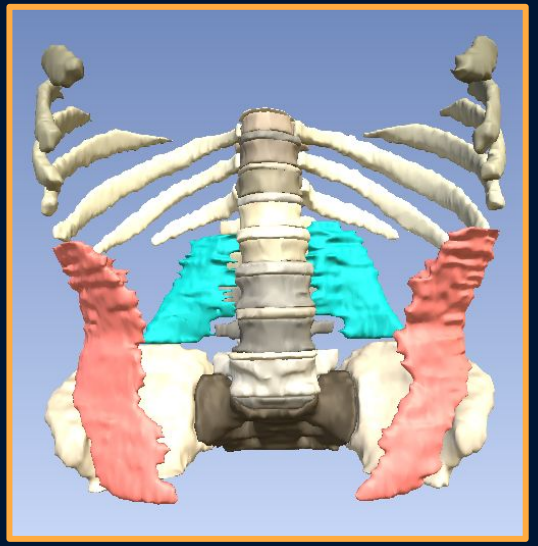
Primary Breathing Muscles



Pelvis, vertebrae, ribs

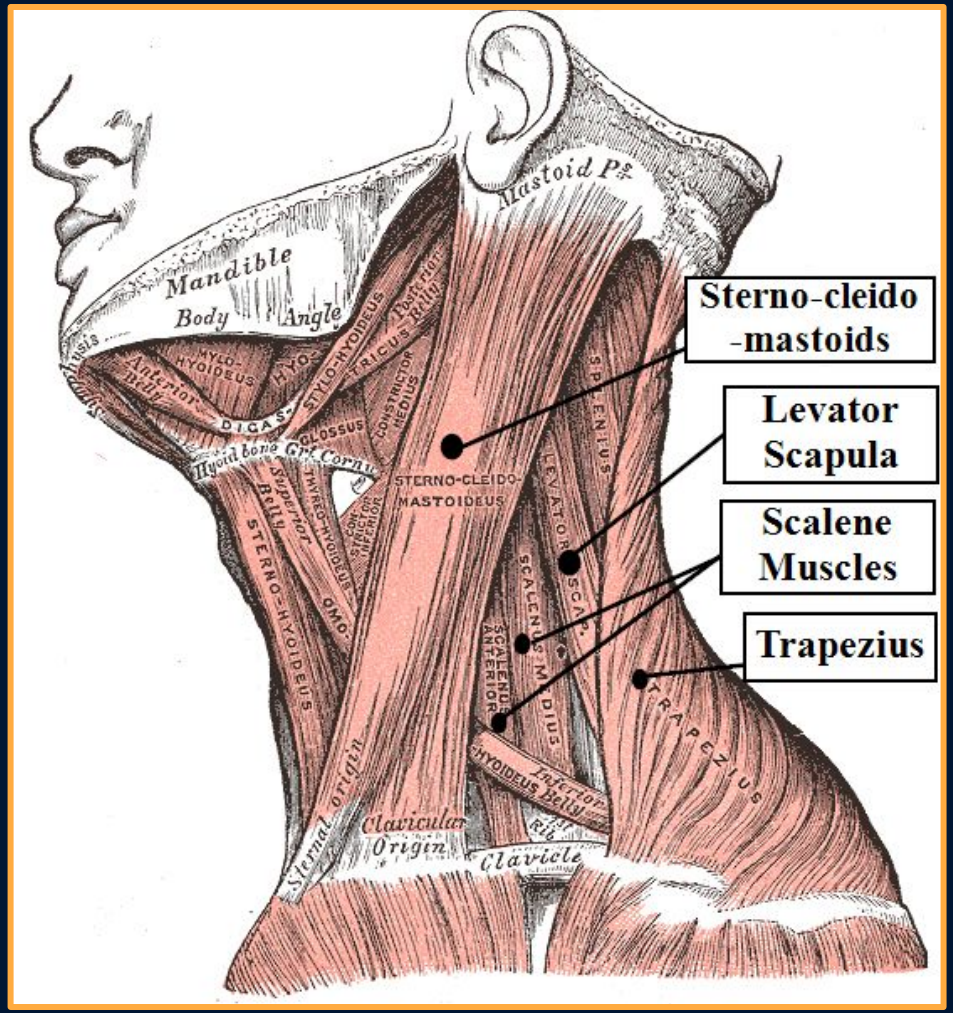
External obliques, rectus abdominis, (not pictured: transversus abdominis)



Internal obliques, quadratus lumborum (in turquoise)

Images Courtesy of: **The Open Anatomy Project,** SPL Abdominal Atlas, September 2015. FREE AND OPEN RIGHTS as of May 29, 2021. https://www.openanatomy.org/atlases/nac/abdomen-2016-09/viewer/#!/view/1cd5bc2f-32f5-4437-9614-7204006d2c8f/state/af5fc1b8-6536-4f99-9599-7bfae3a58d82

Secondary Breathing Muscles



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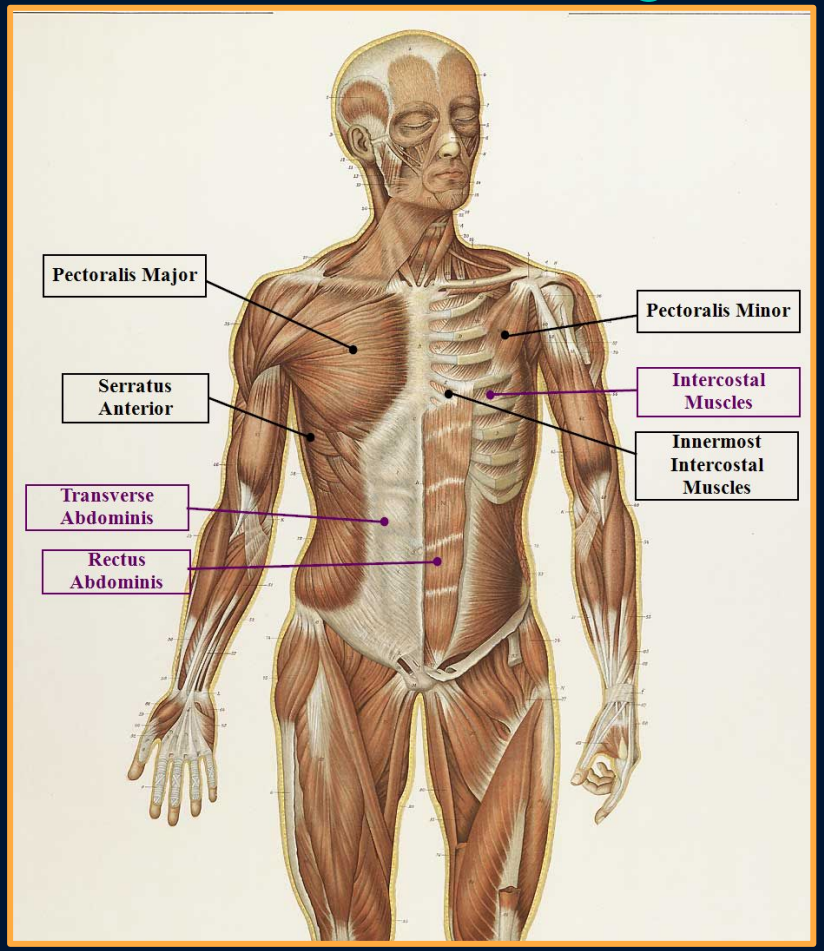
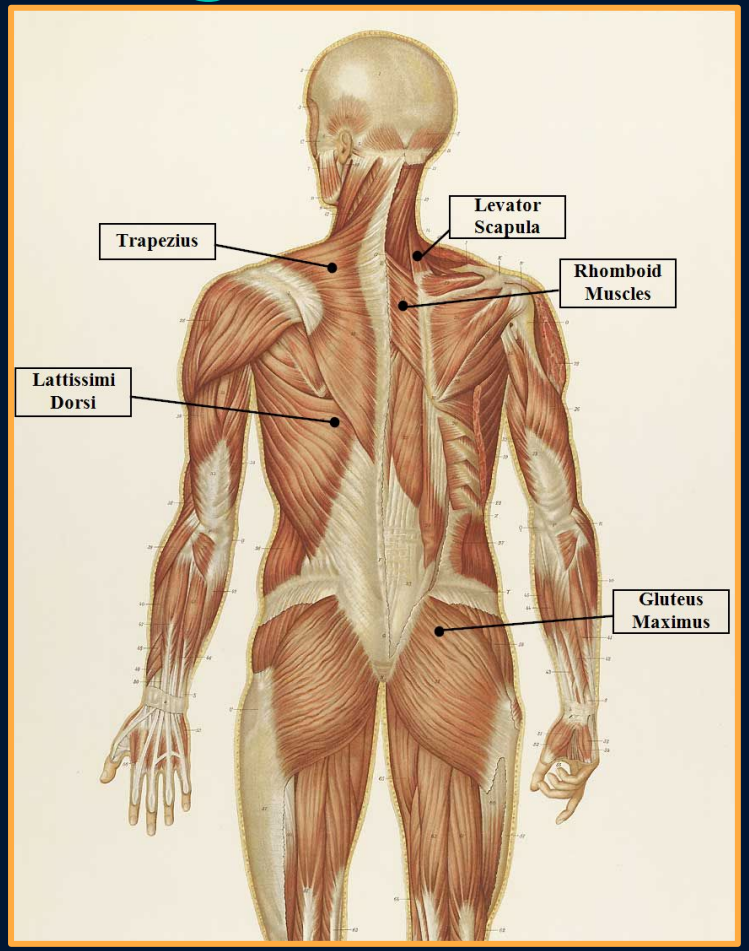
Secondary Breathing Muscles





Images Courtesy of: **The National Library of Medicine.** Anatomie normale du corps humain : atlas iconographique de XVI planches / par le docteur S. Laskowski ; dessineés d'après les préparations de l'auteur par S. Balicki. Publisher: Genève : Braun, 1894. Plates 5 & 6. PUBLIC DOMAIN http://resource.nlm.nih.gov/0232304 (Accessed May 29, 2021)

Anatomy and PEDAGOGY

- Muscle options
- Breathing Methods
- Voice Pedagogy Terms
- Primary vs. Secondary: quality/health
- Unique: holding an instrument

Breathing Methods

Method	Traits	Muscles
clavicular breath	large breath, lots of pressure, larynx may regulate, less control	Upper chest and upper back. (trapezius, scalene). Internal intercostals on the exhale.
thoracic breath	expansion low in the rib cage outward rather than up	Internal intercostals with external intercostals for stabilization on exhale
abdominal breath	“Belly Breathing” “Inner tube”	Diaphragm ONLY on inhalation. Relaxed muscles on inhalation determine where support will occur during exhale. Pull in on exhale.
balanced breath (*appoggio*)	Combo of thoracic AND abdominal Expanded chest OR Expanded belly	External intercostals and diaphragm w relaxed abdominals. Abdominals and ex. intercostal antagonism on exhale. Small change between inhale and exhale

Conclusions:

- We can learn basic anatomy & physiology!
- Clarify technique
- Meet student needs
- Unify field

- **Future Research:** use medical equipment for clarinet breathing.
- Examine interplay of muscles needed to hold the clarinet and those of respiration

Significant Resources:

Your Voice: An Inside View 3rd edition, by Scott McCoy, 2019

English, French, German and Italian Techniques of Singing, by Richard Miller, 1977

Historical Anatomies on the Web. National Library of Medicine and National Institutes of Health. https://www.nlm.nih.gov/exhibition/historicalanatomies/home.htm

Making the Clarinet Sing: Enhancing Clarinet Tone, Breathing, and Phrase Nuance Through Voice Pedagogy, Final Document, by Alyssa Powell, 2020

Questions or Comments?

I would *love* to hear from you!
Email me at:

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Thank you for joining me today!

Thank you, Noby Powell for your IT expertise.

Many thanks to ICA and the Artistic Leadership Team of ClarinetFest 2021. Special thanks to Mary Alice Druhan, Jennifer Mendez Daffinee, and Jessica Harrie!