Pranayama

Teachers Training

Level 1 2023

Anatomy & Physiology
Class 1
Mechanics of Breathing

Yoga Education Collective

ॐ ॐ ॐ

श्री गुरुभ्यो नमः हरिः ॐ

Om Om Om

Sri Gurubhyo Namah Harih Om

Salutations to the Gurus!

ॐ सह नाववतु ।
सह नौ भुनक्तु ।
सह वीर्यं करवावहै ।
तेजस्वि नावधीतमस्तु मा विद्विषावहै ।
ॐ शान्तिः शान्तिः शान्तिः ॥

oṃ saha nāvavatu saha nau bhunaktu
saha vīryaṃ karavāvahai
tejasvi nāvadhītam astu mā vidviṣāvahai
oṃ śāntiḥ śāntiḥ śāntiḥ

May that Brahman protect us together. May it nourish us together. May we both gain great vitality. May our learning be brilliant. May we never argue. Om peace, peace, peace.

Breathing is the most crucial life support function

1. We can live without food for weeks,

   without water for days,

   but without air - only for a few minutes

2. Breathing is so important that it is automatic

3. We do not think about it

4. Pranayama is the art of paying attention to breathing

5. It enables you to do the maximum with the minimum

Prana & Pranayama from "*The Science of Pranayama*" by Swami Sivananda

Yoga Education Collective

Prana is the sum total of all energy that is manifest in the universe.

It is the sum total of all forces in nature and powers which are hidden in people and which lie everywhere around us. Heat, light, electricity, magnetism are the manifestations of Prana.

Whatever moves or works or has life, is but an expression or manifestation of Prana.

The Prana is related to mind and through mind to will, and through will to the individual soul, and through this to the Supreme Being.

If you know how to control the little waves of Prana working through the mind, then the secret of subjugating universal Prana will be known to you. The Yogi who becomes an expert in the knowledge of this secret, will have no fear from any power, because he has mastery over all the manifestations of powers in the universe.

https://www.holybooks.com/wp-content/uploads/The-Science-of-Pranayama-by-Sri-Swami-Sivananda.pdf

Pranayama - Levels of Organization

1. **Causal - Karana Sharira**
   Source - point of origin and return.

2. **Subtle - Sukshma Sharira**
   Pranas, Nadis, Indriyas, Antahkarana

3. **Physical - Sthula Sharira**

    1. **Biomechanical**
       Respiratory, Cardiovascular, Myofascial & Lymphatic Systems

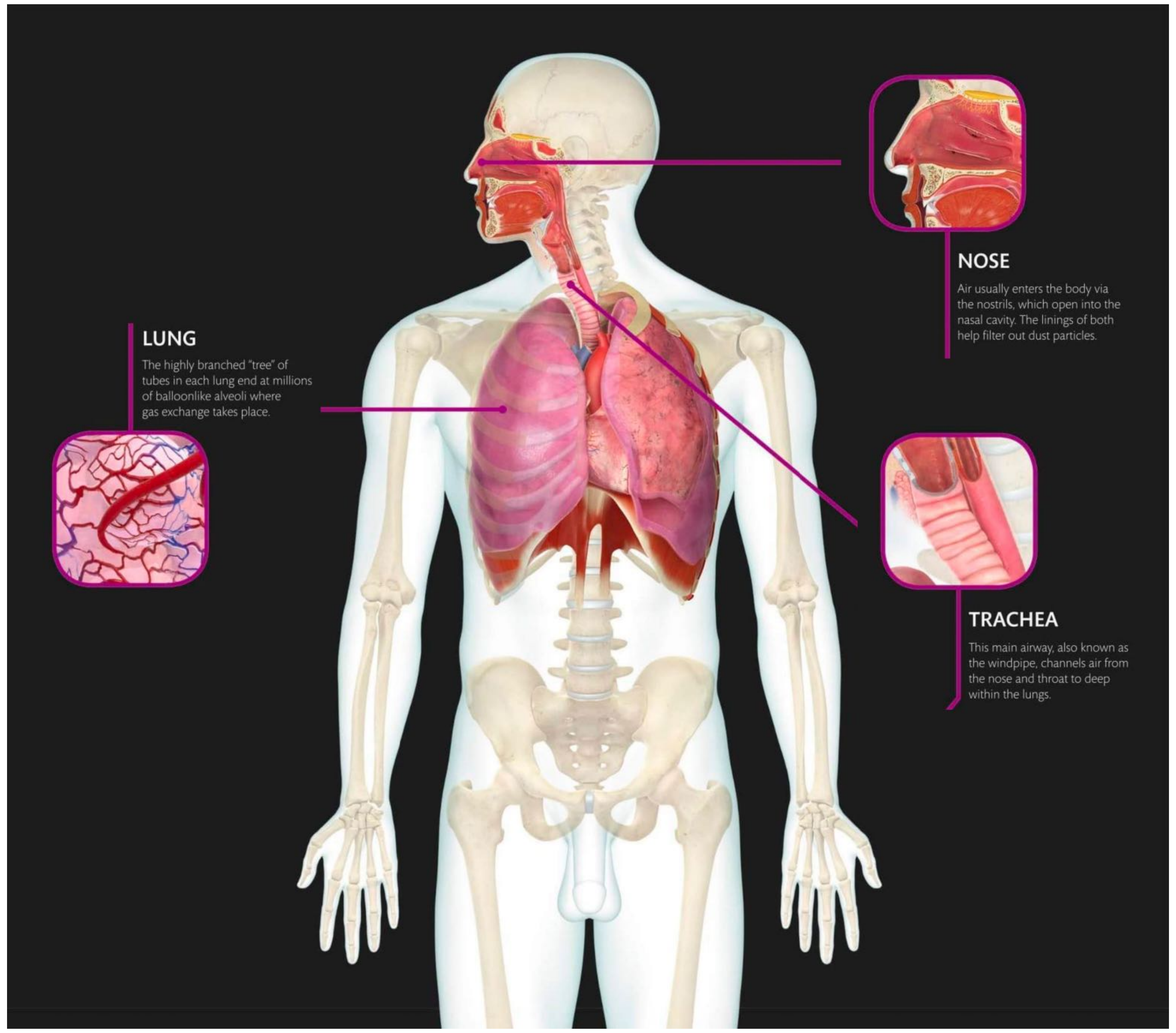
    2. **Biochemistry**
       Oxygen, Carbon dioxide, Nitric oxide, Blood pH

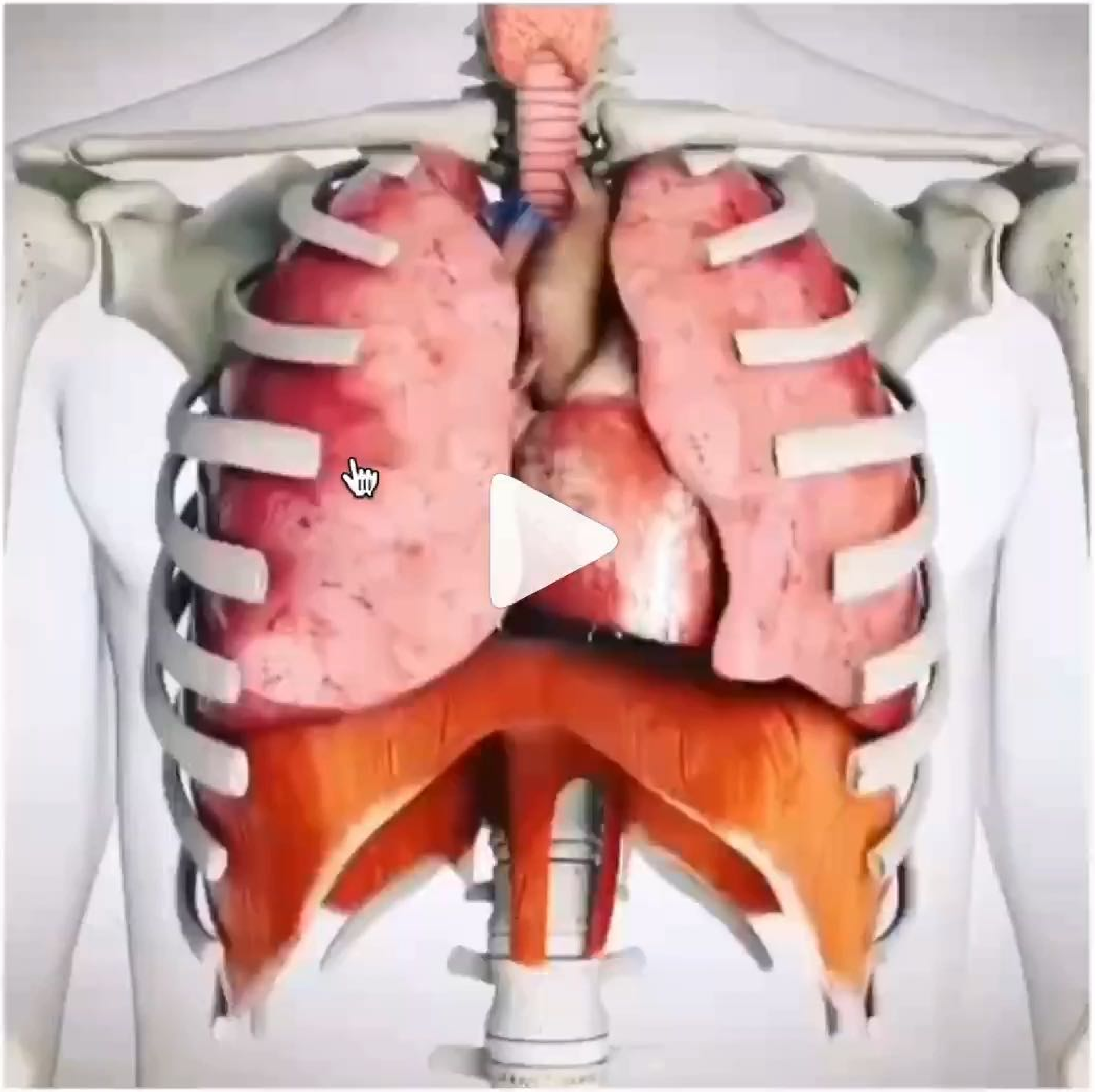
    3. **Psychophysiology**
       Nervous and Endocrine Systems

Biomechanics

1. **Complete Anatomy App.**
   Share Screen

2. Describe Anatomy of
   Respiratory System





Source: Unknown Instagram

Germ layers of the body develop from fertilized ovum

Ectoderm

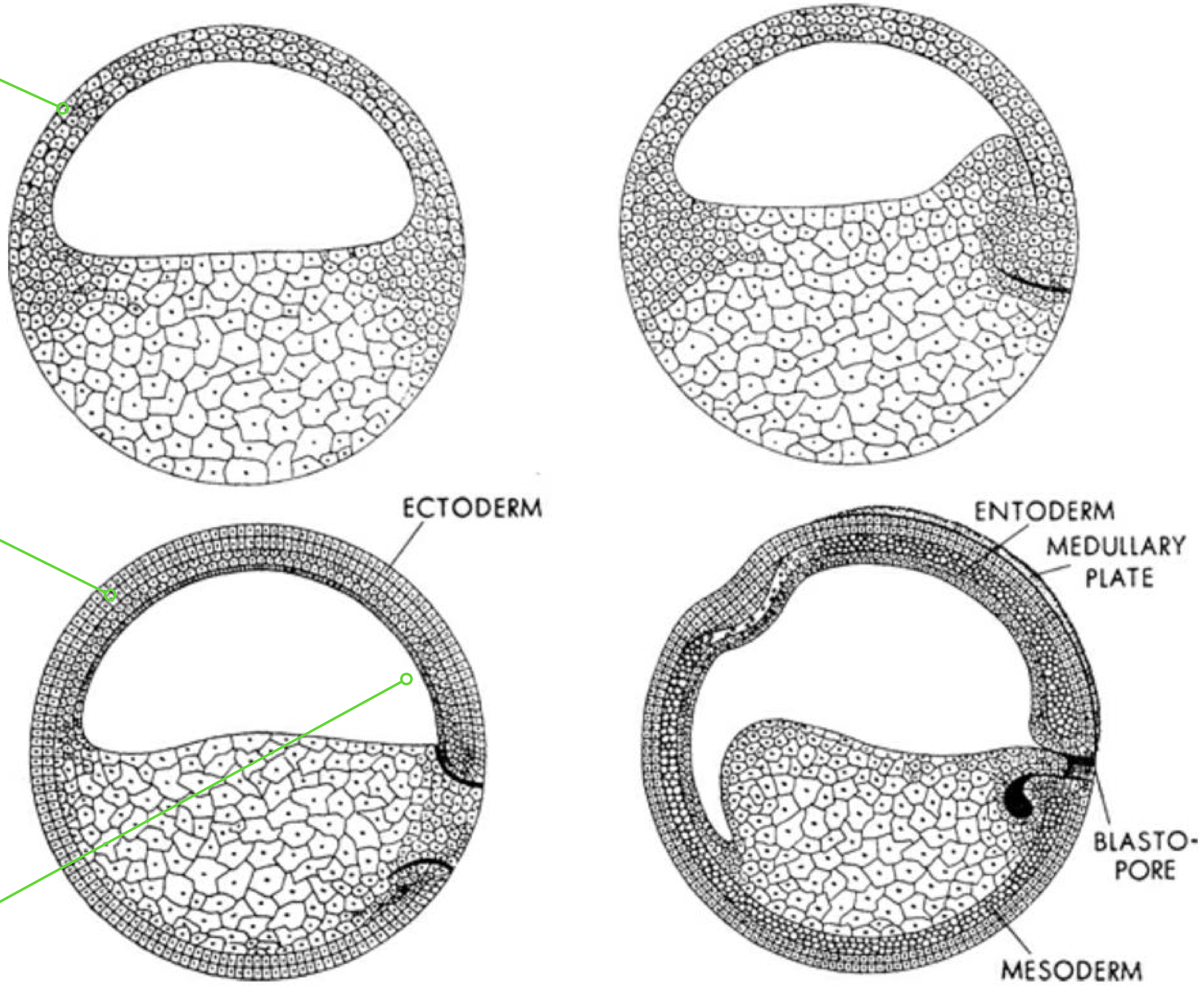
Generally speaking, the ectoderm differentiates to form epithelial and neural tissues (spinal cord, peripheral nerves and brain). This includes the skin, linings of the mouth, anus, nostrils, sweat glands, hair and nails, and tooth enamel.

Mesoderm

Some of the mesoderm derivatives include the muscle (smooth, cardiac and skeletal), the muscles of the tongue (occipital somites), the pharyngeal arches muscle (muscles of mastication, muscles of facial expressions), connective tissue, dermis and subcutaneous layer of the skin, bone and cartilage, dura mater, endothelium of blood vessels, red blood cells, white blood cells, and microglia, Dentine of teeth, the kidneys and the adrenal cortex.

Endoderm

The embryonic endoderm develops into the interior linings of two tubes in the body, the digestive and respiratory tubes.



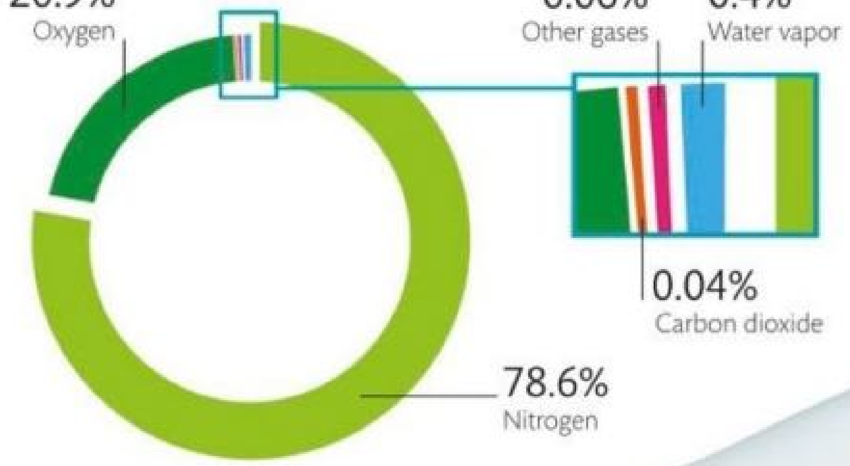
Text from Wikipedia. Illustration from Job's Body by Deane Juhan

JOURNEY OF AIR

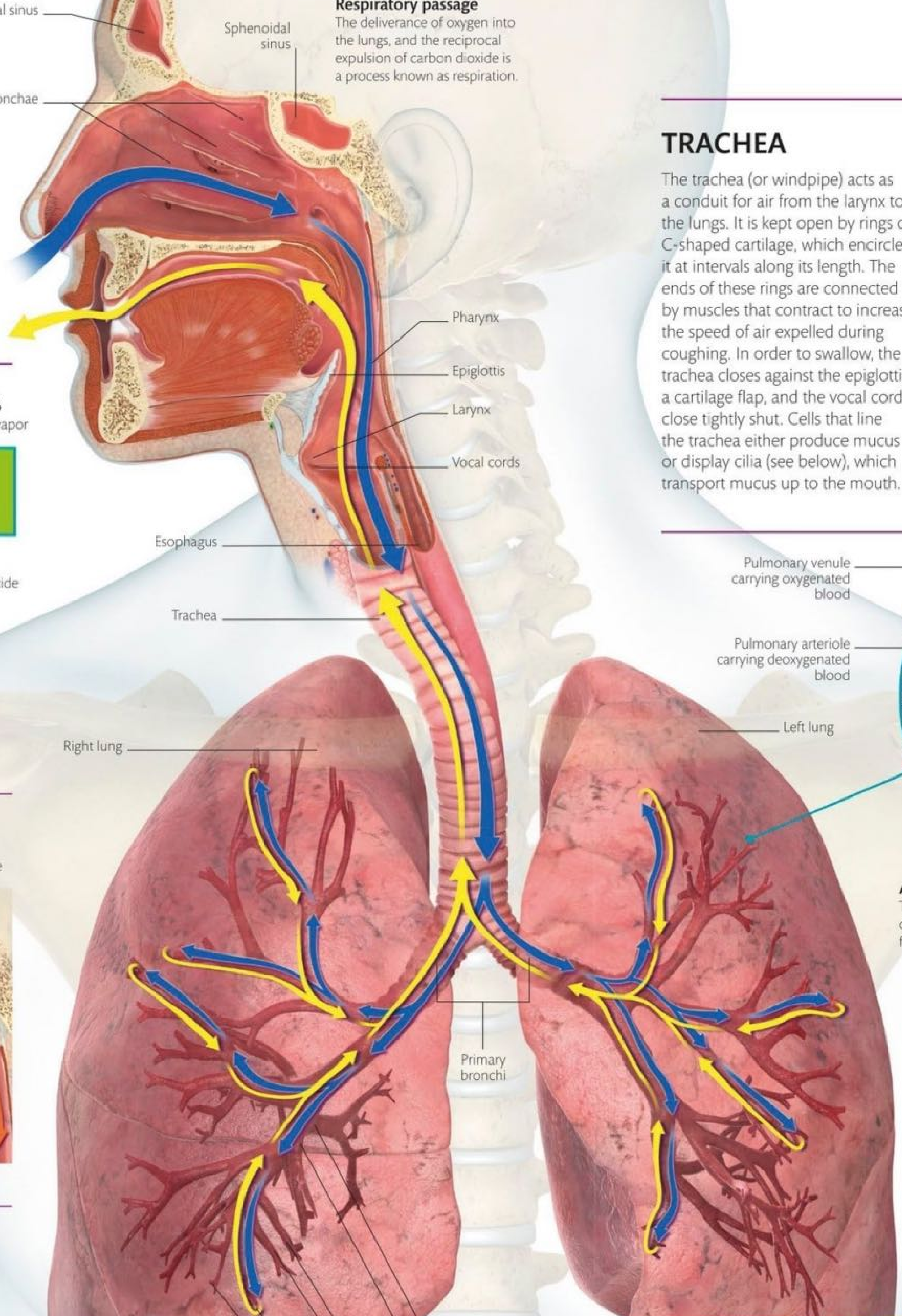
The respiratory tract is responsible for transporting air into and out of the lungs, and for the essential exchange of oxygen and carbon dioxide between the blood and the air in the lungs. It also protects the entire body by providing key lines of defense against potentially harmful particles that are inhaled.

AIR FLOW

With every breath, air is drawn into the alveoli of the lungs via the respiratory tract. It travels from the nose or mouth, past the pharynx, through the larynx, and enters the trachea. This splits into two smaller tubes, one entering each lung, called the primary bronchi, which in turn branch into increasingly smaller bronchi and then into bronchioles attaching to the alveoli (tiny air sacs). During this long journey, the air is warmed to body temperature and has any particles filtered out. Used air makes the same journey in reverse, but as it passes though the larynx it can be employed to produce sound.



Breathable air
Nitrogen is the gas that occupies the largest part of atmospheric air, yet at the pressure at sea level, very little dissolves in human blood, so it is able to pass harmlessly into and out of the body.

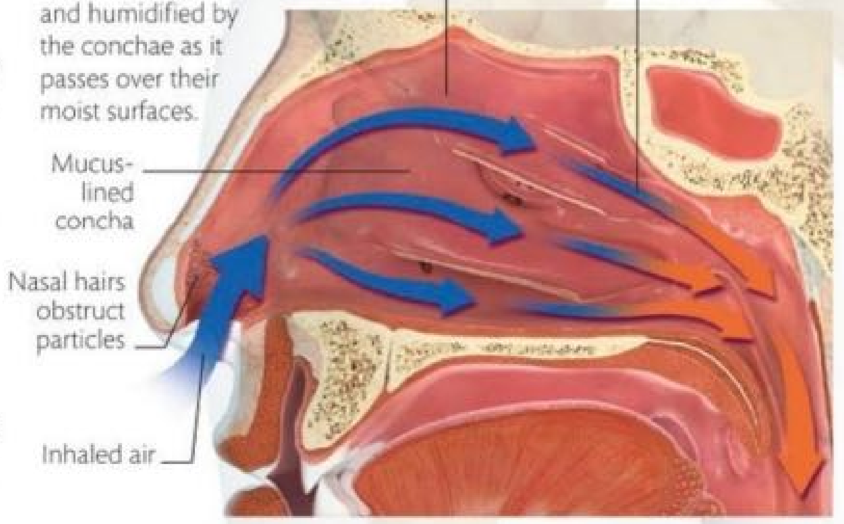


Respiratory passage
The deliverance of oxygen into the lungs, and the reciprocal expulsion of carbon dioxide is a process known as respiration.

NASAL CONCHAE

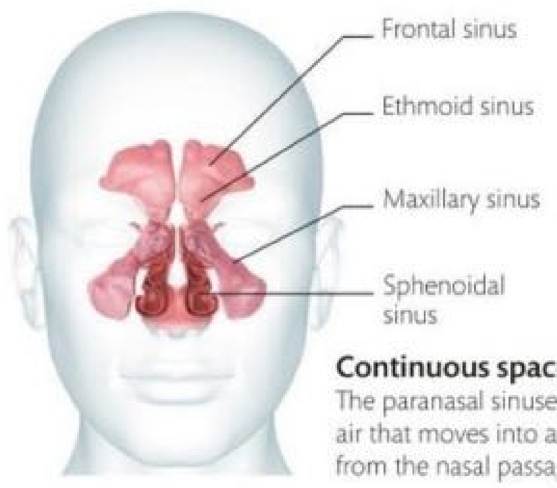
Three shelflike projections in the nasal cavity provide an obstruction to inhaled air, forcing it to spread out as it passes over their surfaces. This fulfills several roles. The moist, mucus-lined conchae humidify passing air and entrap inhaled particles, while their many capillary networks warm the air to body temperature before it reaches the lungs. Nerves within the conchae sense the condition of the air and, if needed, cause them to enlarge—if the air is cold, for example, a larger surface area helps warm it more effectively. This is what gives a feeling of nasal congestion.

Protection
Cold, inhaled air is gradually warmed and humidified by the conchae as it passes over their moist surfaces.



PARANASAL SINUSES

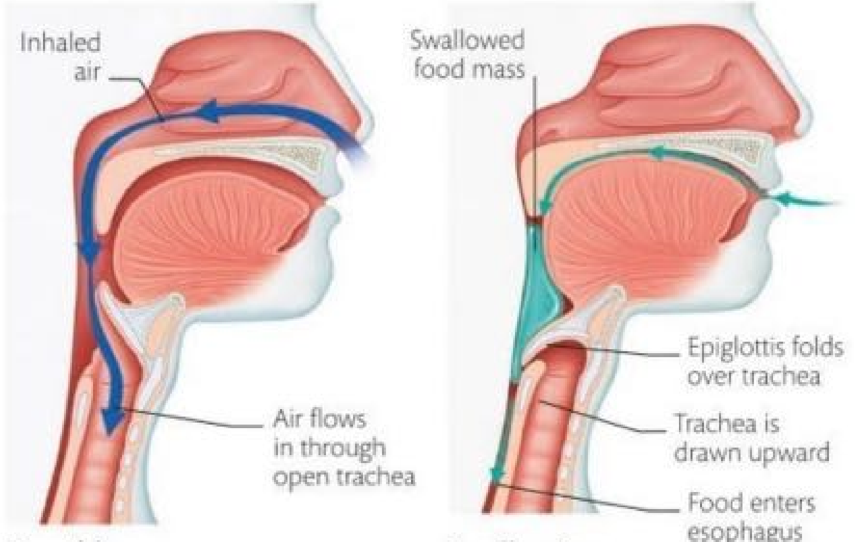
Four pairs of air-filled cavities called paranasal sinuses sit within the facial bones of the skull. They are lined with cells that produce mucus, which flows into the nasal passageways through very small openings. The roles of the sinuses are to lighten the heavy skull bones and to improve the resonance of the voice by acting as an echo chamber. Their effectiveness becomes obvious during a cold, when the small openings into the nose become blocked, giving a nasal quality to the voice.



Continuous space
The paranasal sinuses are filled with air that moves into and out of them from the nasal passageways.

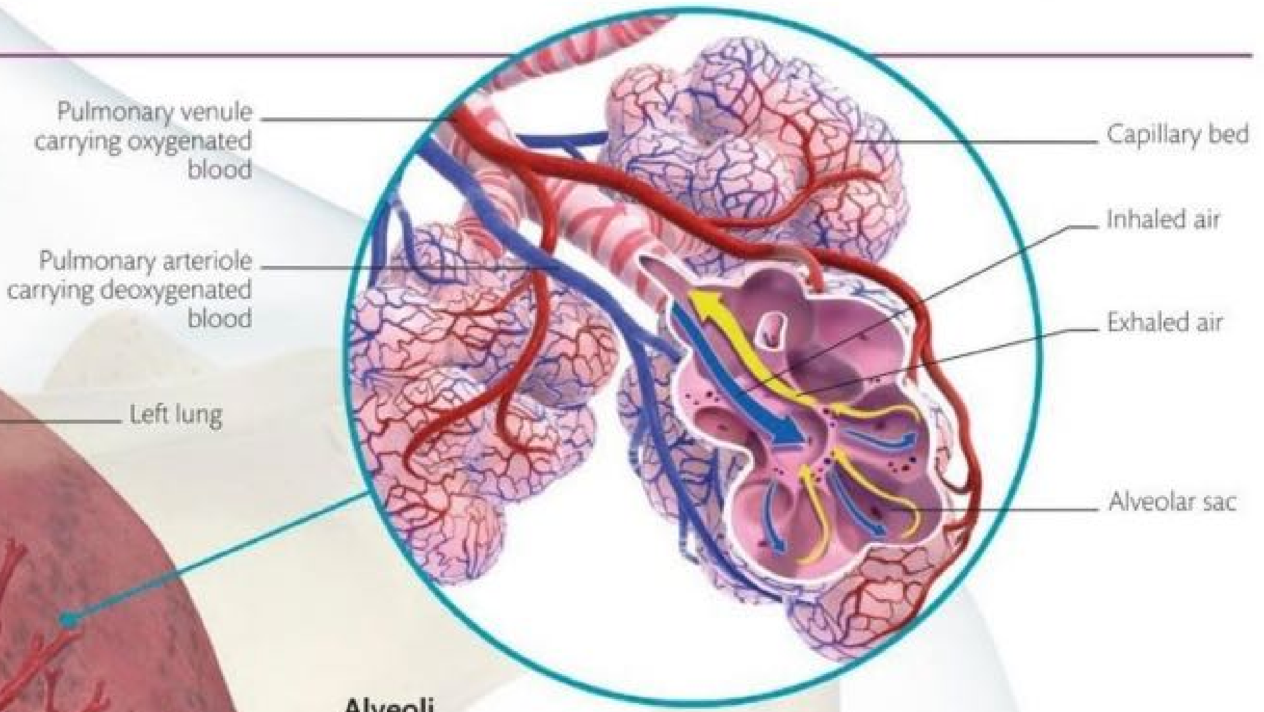
TRACHEA

The trachea (or windpipe) acts as a conduit for air from the larynx to the lungs. It is kept open by rings of C-shaped cartilage, which encircle it at intervals along its length. The ends of these rings are connected by muscles that contract to increase the speed of air expelled during coughing. In order to swallow, the trachea closes against the epiglottis, a cartilage flap, and the vocal cords close tightly shut. Cells that line the trachea either produce mucus or display cilia (see below), which transport mucus up to the mouth.



Breathing
The trachea remains open, allowing air to flow freely into and out of the lungs.

Swallowing
The trachea is pulled upward so that it is closed off by the epiglottis. Food passes down the esophagus.

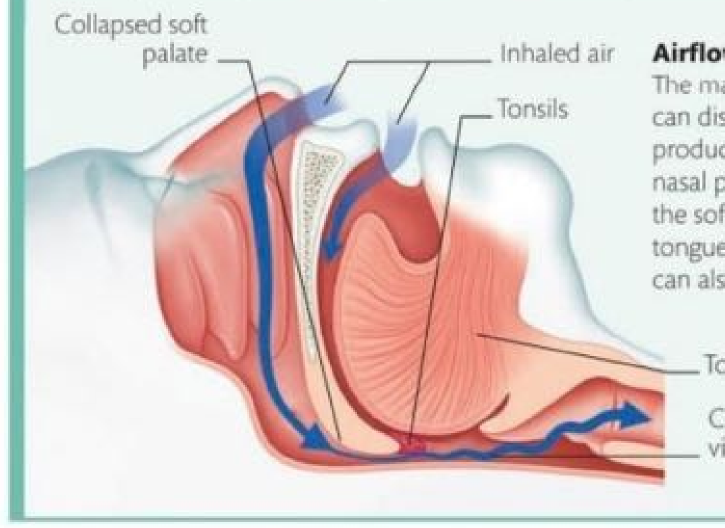


Alveoli
Tiny air sacs, encased by a network of capillaries, are the final destination of inhaled air. In each alveolar sac, oxygen is traded for carbon dioxide in a process called gas exchange (see p.340).

SNORING

Over one third of people snore. The incidence is higher in older people and those who are overweight. The noise is produced by the vibration of soft tissues in the airways as air is breathed in and out. When a person is awake, the soft tissues at the back of the mouth are kept out of the way of the airflow by the tone of the surrounding muscles. During sleep these muscles relax and the soft tissues flop into the air stream and cause it to vibrate, producing the snoring noise.

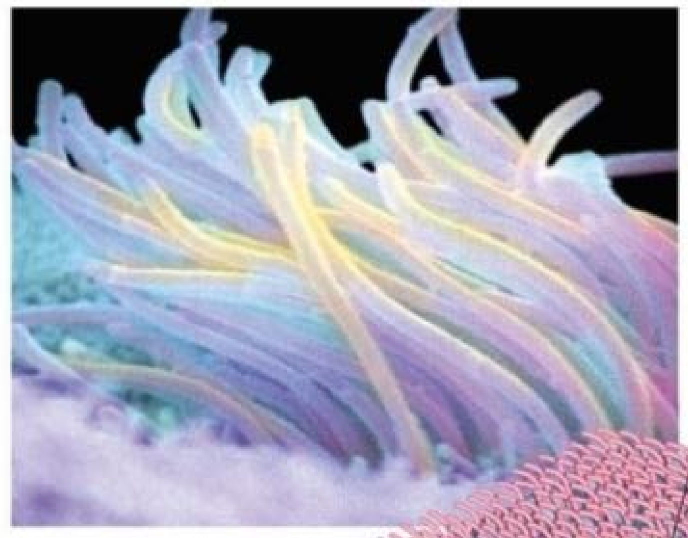
Sleepless nights
Severe snoring can cause "obstructive sleep apnea", a condition where the snorer stops breathing during sleep.



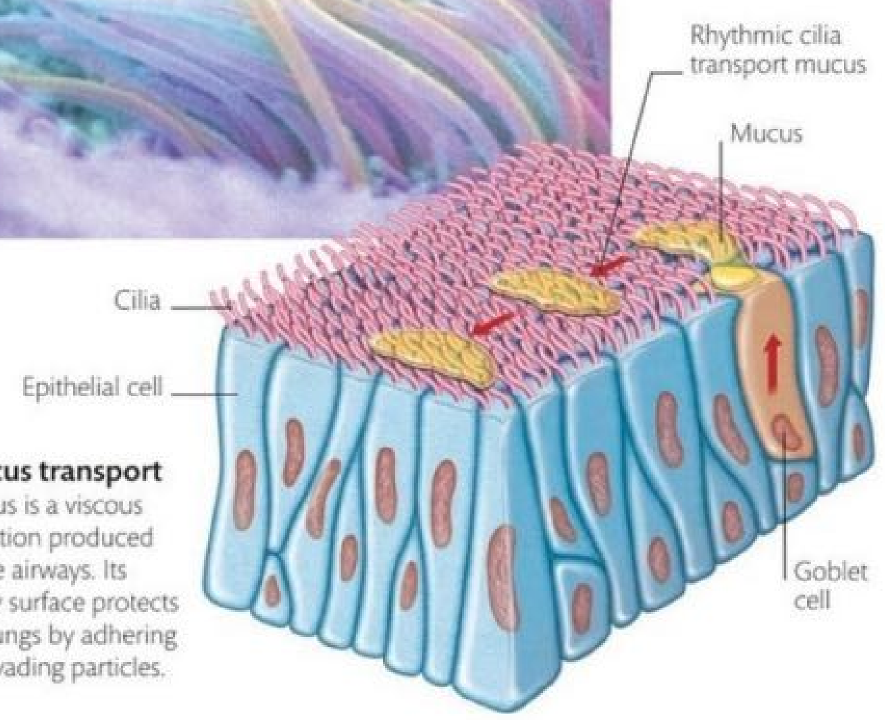
Airflow
The main soft tissues that can disturb air flow to produce snoring are the nasal passageways, the soft palate, and the tongue. Swollen tonsils can also contribute.

CILIA

The air passages from the nose through to the bronchi are lined with two types of cells: epithelial cells and goblet cells. The more numerous epithelial cells have tiny, hairlike projections called cilia on their surface. Cilia continually beat toward the upper airways. The goblet cells produce mucus, which they secrete into the lining of the airways where it can trap inhaled particles, such as dust. The cilia then act as a conveyor belt, transporting the mucus, along with any trapped particles, away from the lungs into the upper airways, where it can be coughed or blown out, or swallowed.



Cilia beat
The speed at which cilia beat depends on temperature. They slow down below 90°F (32°C) and over 104°F (40°C).



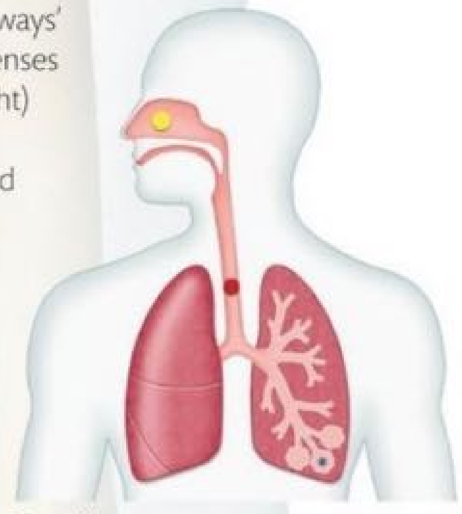
Mucus transport
Mucus is a viscous secretion produced in the airways. Its sticky surface protects the lungs by adhering to invading particles.

DUST INHALATION

Many particles of varying size are inhaled along with air and can lodge along the airways. To prevent these particles from damaging the airways' lining, or causing infection, defenses such as mucus and cilia (see right) are in place. For microscopic particles, white blood cells called macrophages patrol the alveoli and destroy invaders.

KEY TO PARTICLE SIZE
- Large – 6µm or over
- Small – 1–5µm
- Tiny – under 1µm

Final defense
A macrophage (green) checks a lung cell for foreign particles. Once a threat is destroyed, the macrophage will migrate into the bronchioles to be expelled from the airways via mucus.



Dust filter
Large particles, such as dust, lodge in the nasal cavity; smaller ones, such as fine coal dust, in the trachea; and the tiniest, such as cigarette smoke particles, reach the alveoli.

Respiratory System - Nose to pharynx

Nose

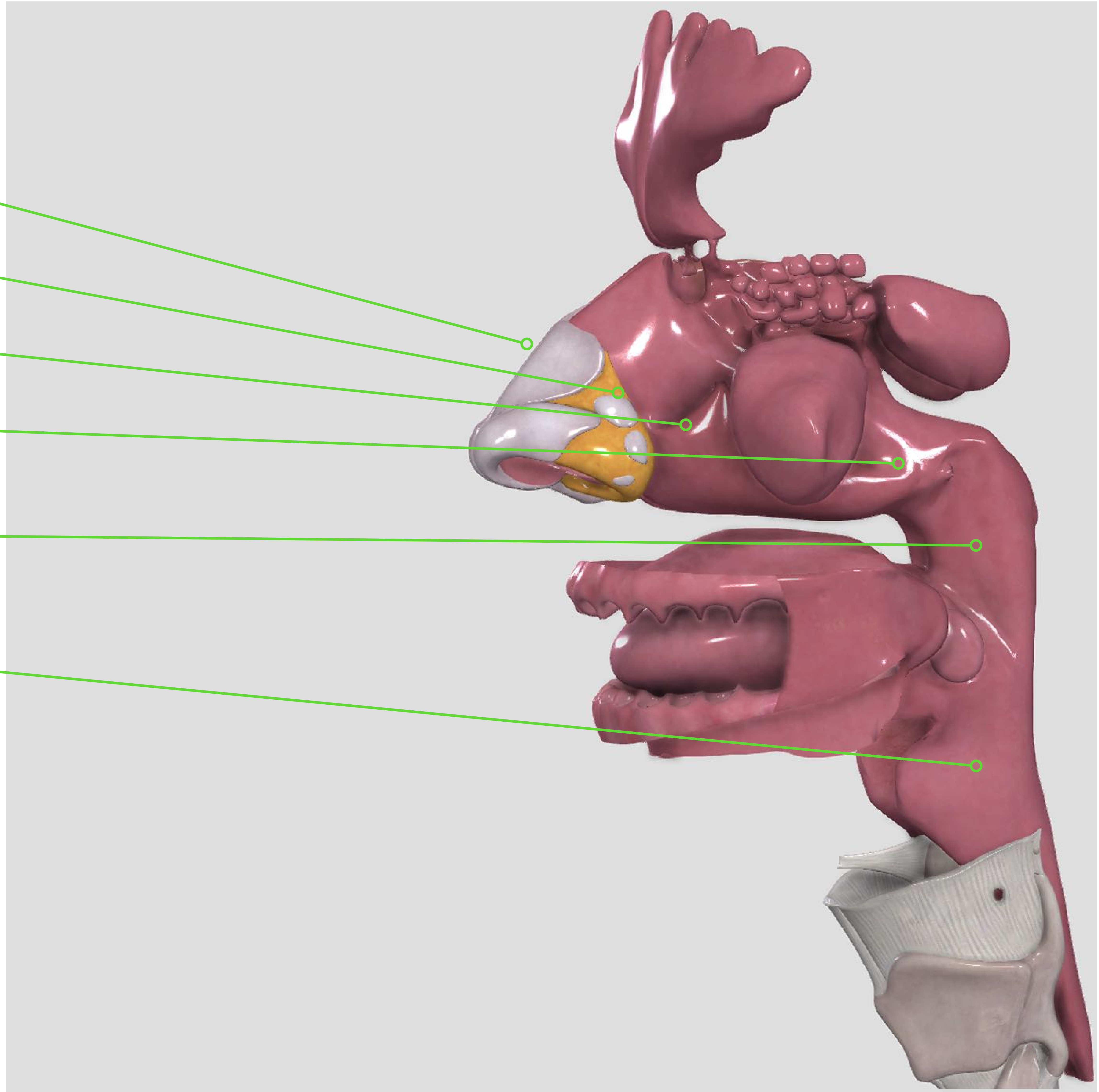
Nasal cavity

Nasal sinuses

Nasopharynx

Oropharynx

Laryngopharynx



Respiratory System - Larynx, trachea, bronchi, lungs

Larynx (voice box)

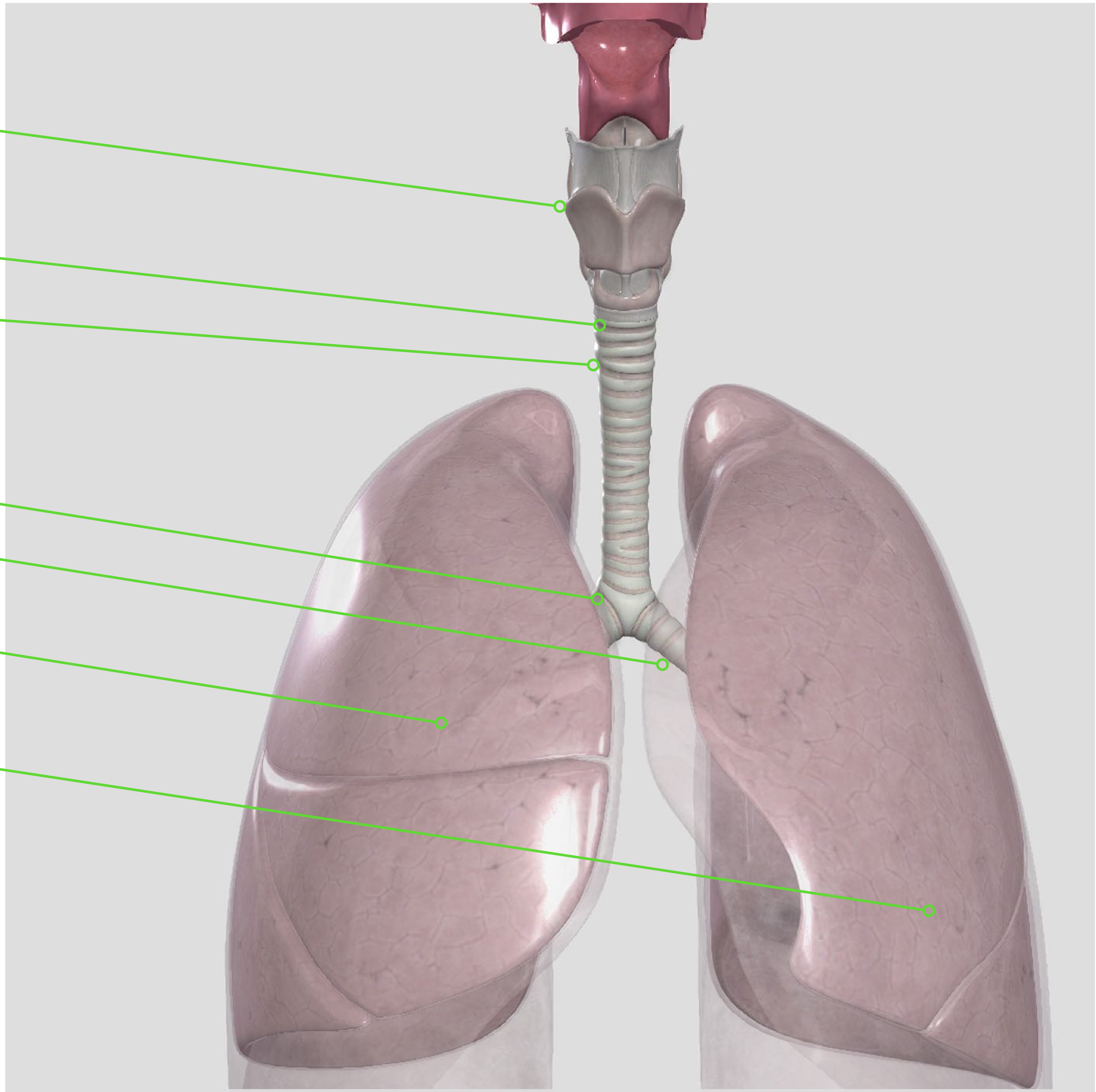
Trachea

Tracheal cartilages

Bronchi

Right lung

Left lung



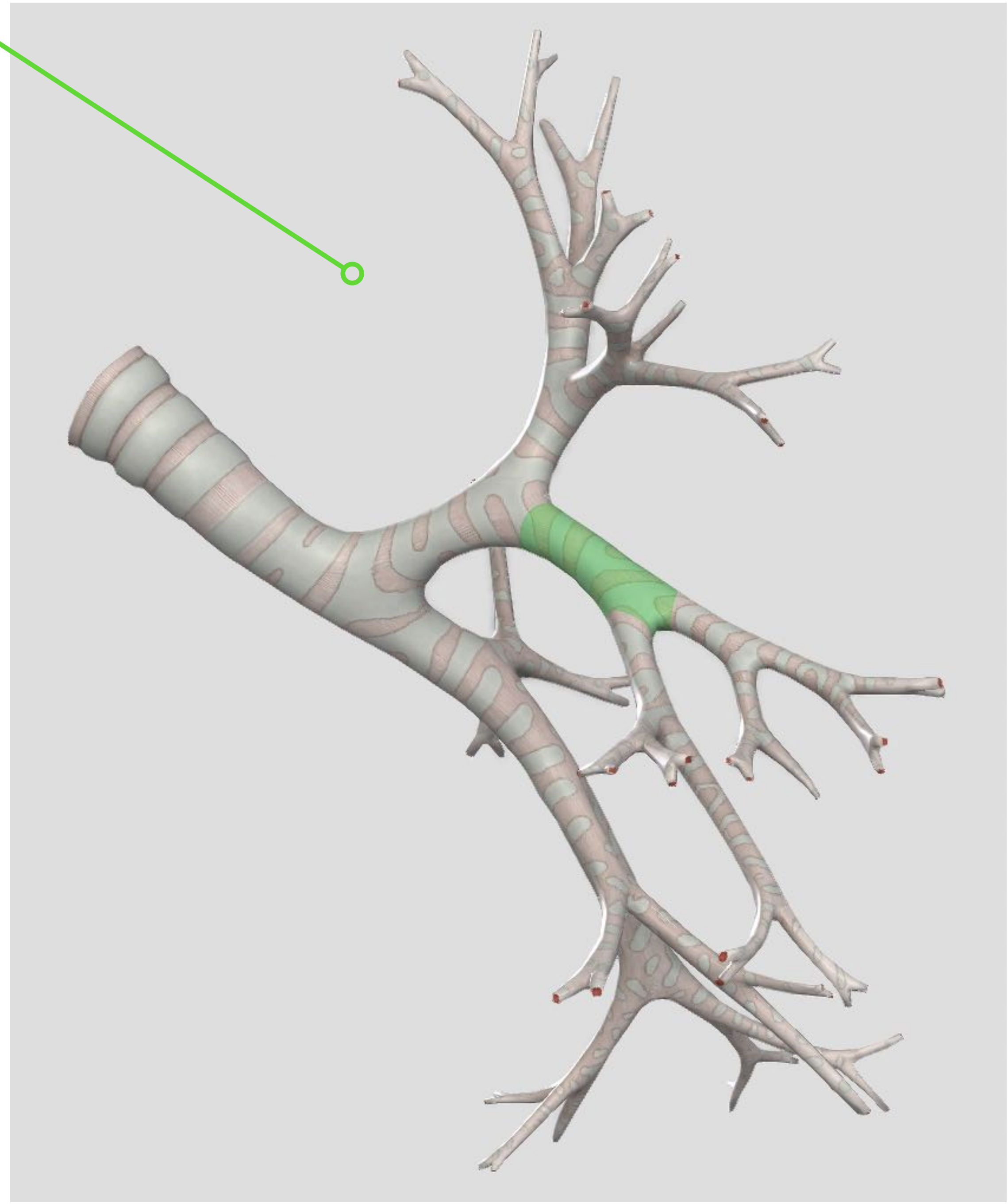
Respiratory System - Bronchi

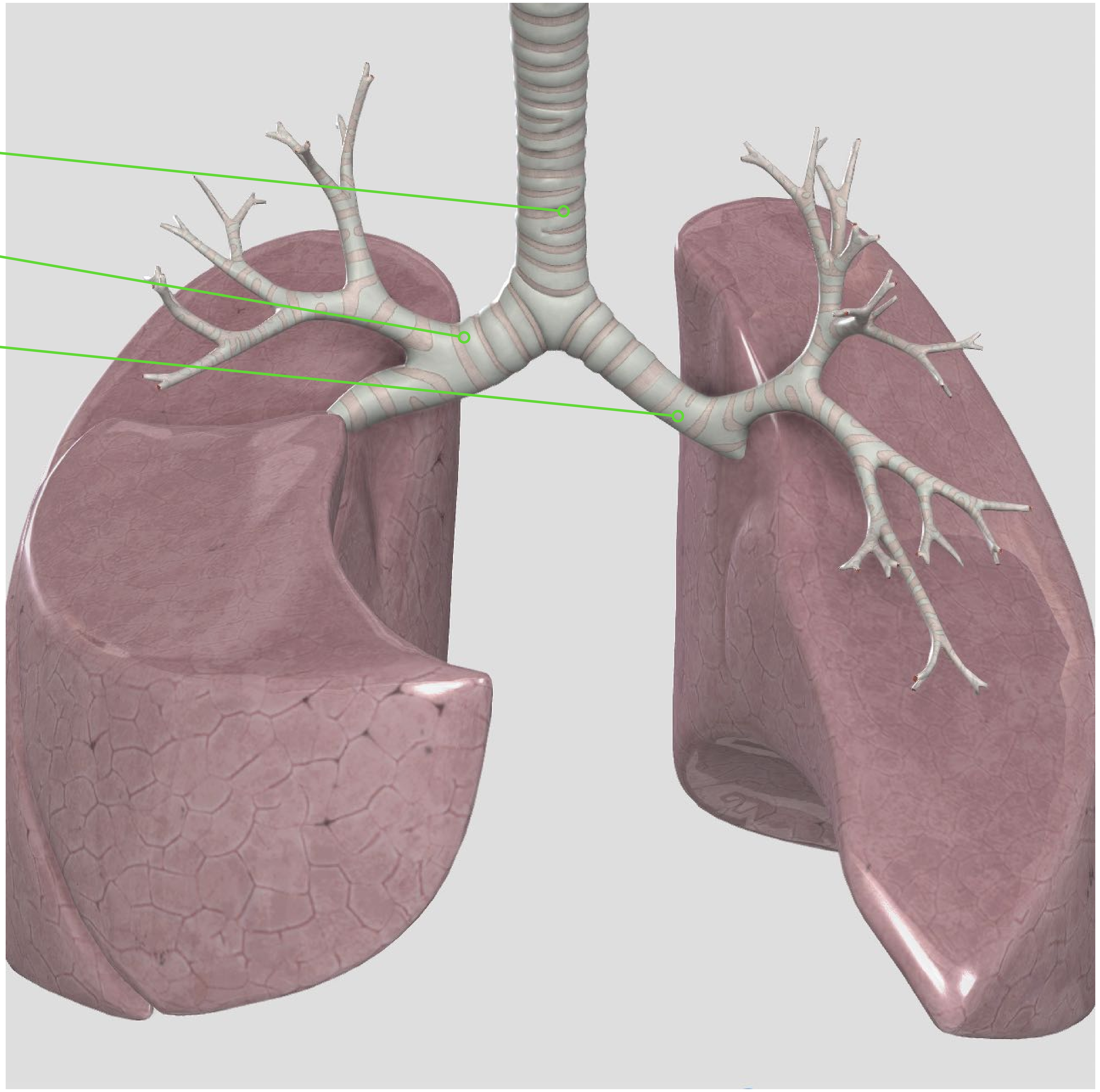
Trachea

Right main bronchus

Left main bronchus

Bronchial tree





Respiratory System - Bronchial tree & alveoli

Branch of pulmonary vein

Branch of pulmonary artery

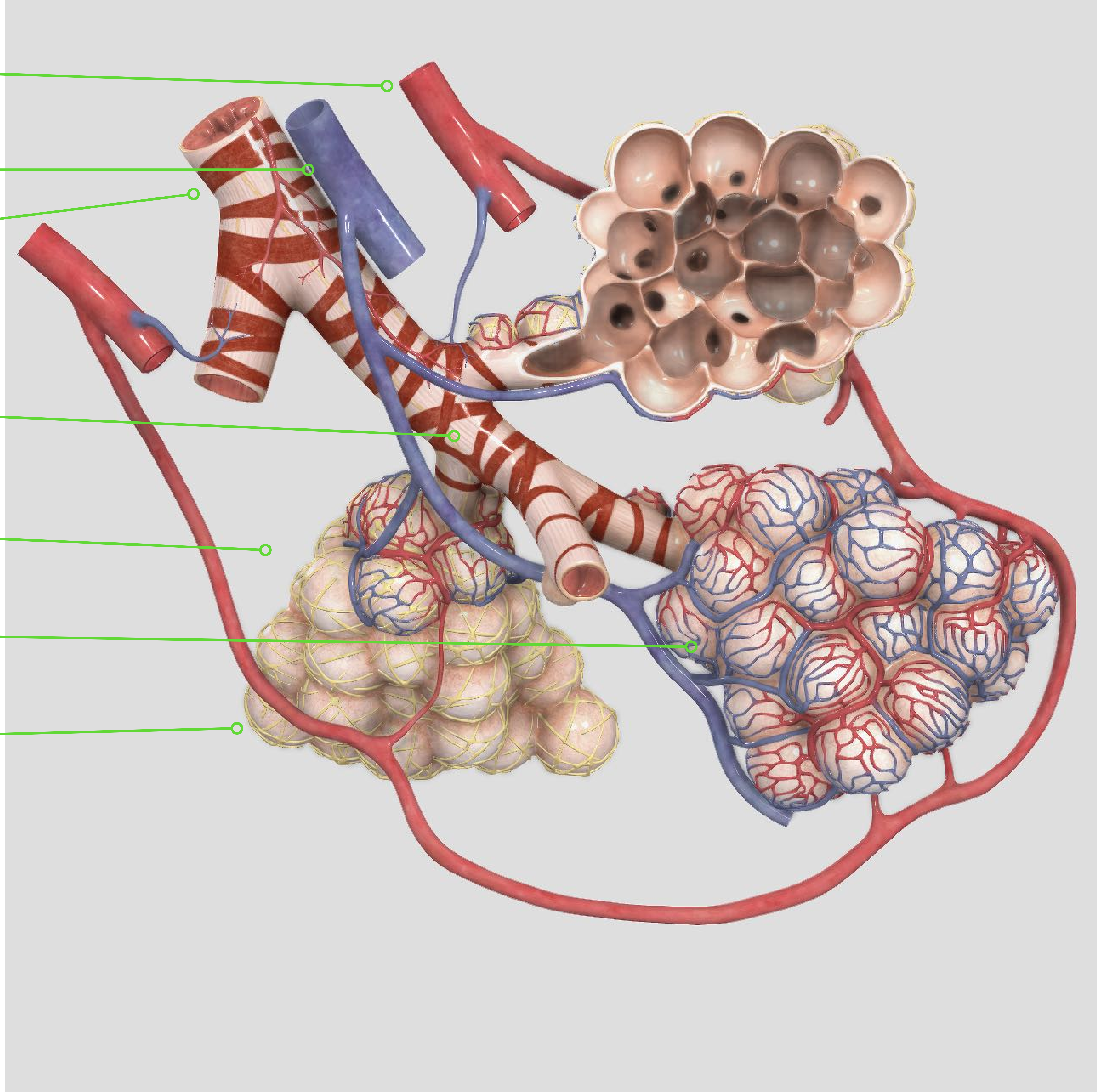
Terminal bronchiole

Respiratory bronchiole

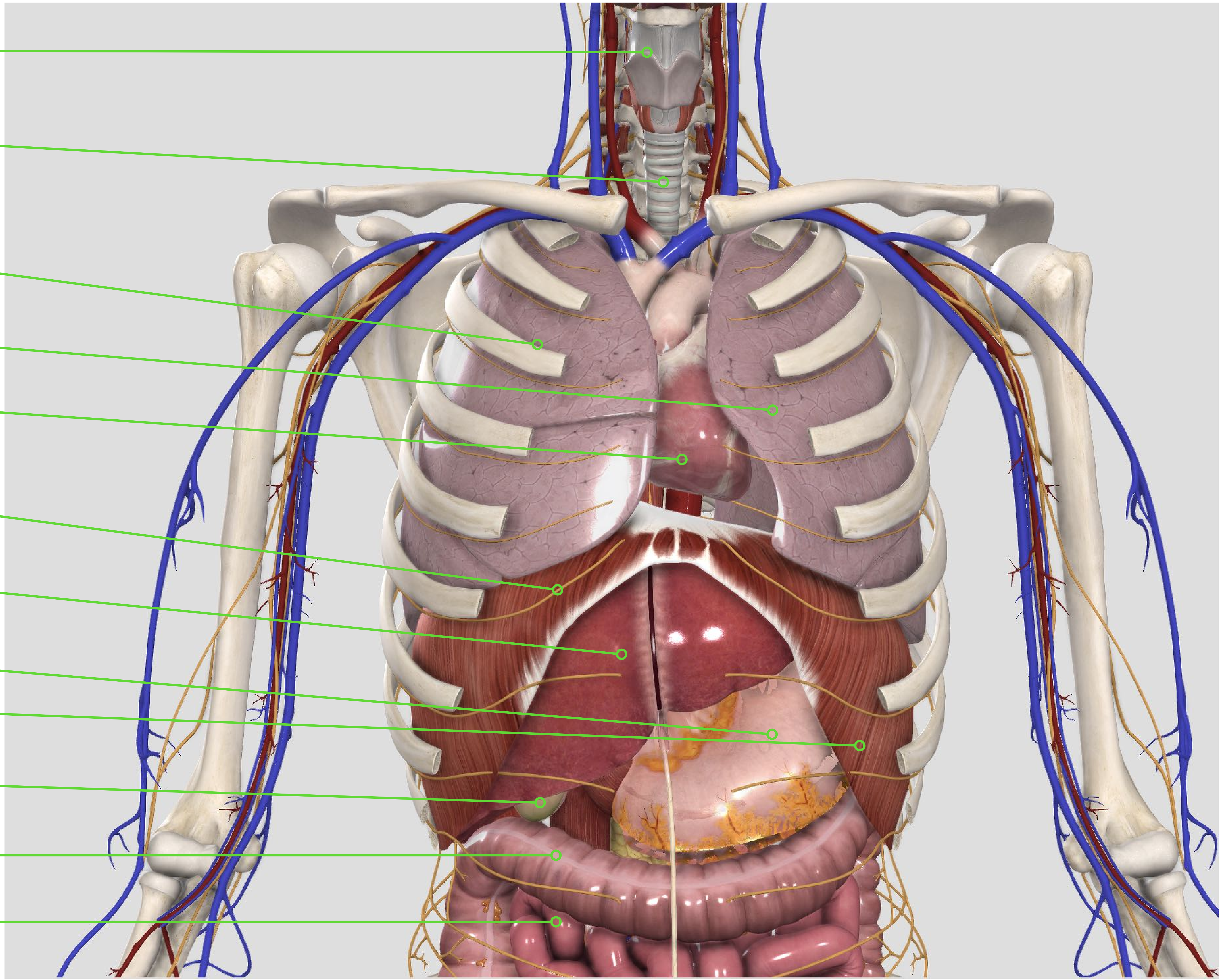
Alveoli

Capillary network

Elastic fibers



Thorax and abdomen



MECHANICS OF BREATHING

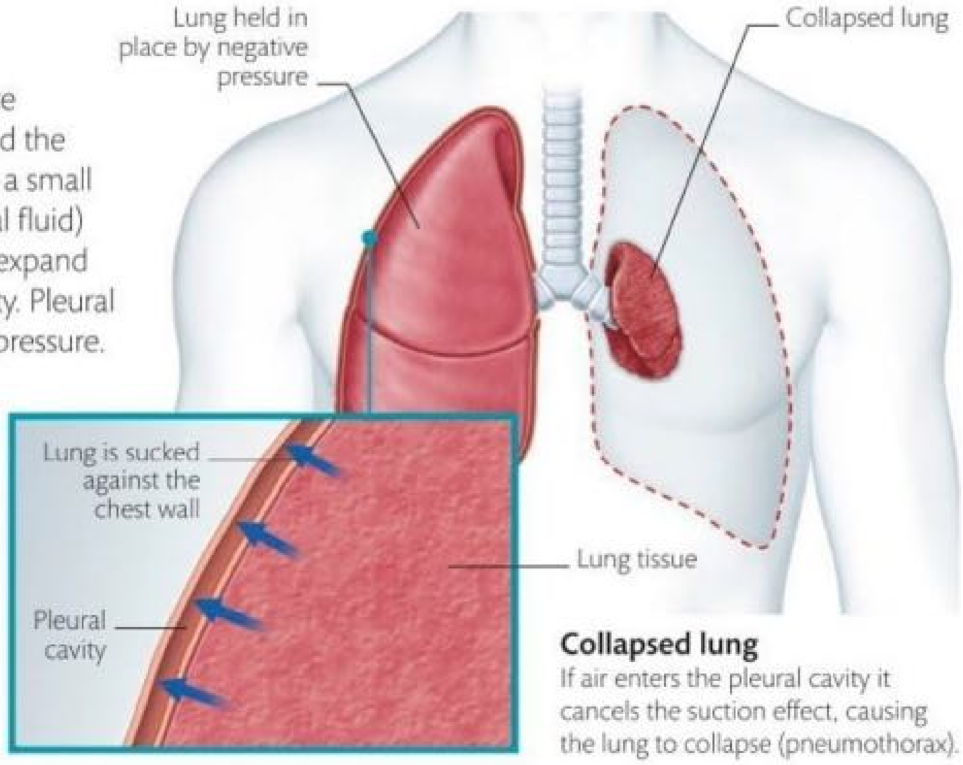
The movement of air into and out of the lungs, known as respiration, is brought about by the action of muscles in the neck, chest, and abdomen, which work together to alter the volume of the chest cavity. During inhalation fresh air is drawn into the lungs, and during exhalation stale air is expelled into the atmosphere.

MUSCLES OF RESPIRATION

The diaphragm is the main muscle of respiration. It is a dome-shaped sheet of muscle that divides the chest cavity from the abdominal cavity, attaching to the sternum at the front of the chest, the vertebrae at the back of the chest, and to the lower six ribs. Various accessory muscles are located within the rib cage, neck, and abdomen, but these muscles are used only during forced respiration. For normal, quiet respiration, the diaphragm contracts and flattens to inhale, increasing the depth of the chest cavity and drawing air into the lungs. Normal, quiet exhalation is passive and brought about by the relaxation of the diaphragm as well as the elastic recoil of the lungs. If extra respiratory effort is required, for example during exercise, when the body's cells need a greater supply of oxygen to function efficiently, then contraction of the accessory muscles bolsters the action of the diaphragm to allow deeper breathing. Different accessory muscles are used for inhalation and exhalation.

PLEURAL CAVITY

The pleural cavity is a narrow space between the lining of the lungs and the lining of the chest wall. It contains a small amount of lubricating fluid (pleural fluid) that prevents friction as the lungs expand and contract within the chest cavity. Pleural fluid is held under slight negative pressure. This creates a suction between the lungs and the chest wall that holds the lungs open and prevents the alveoli from closing at the end of exhalation. If the alveoli were to close completely, an excessive amount of energy would be needed to reinflate them during inspiration.



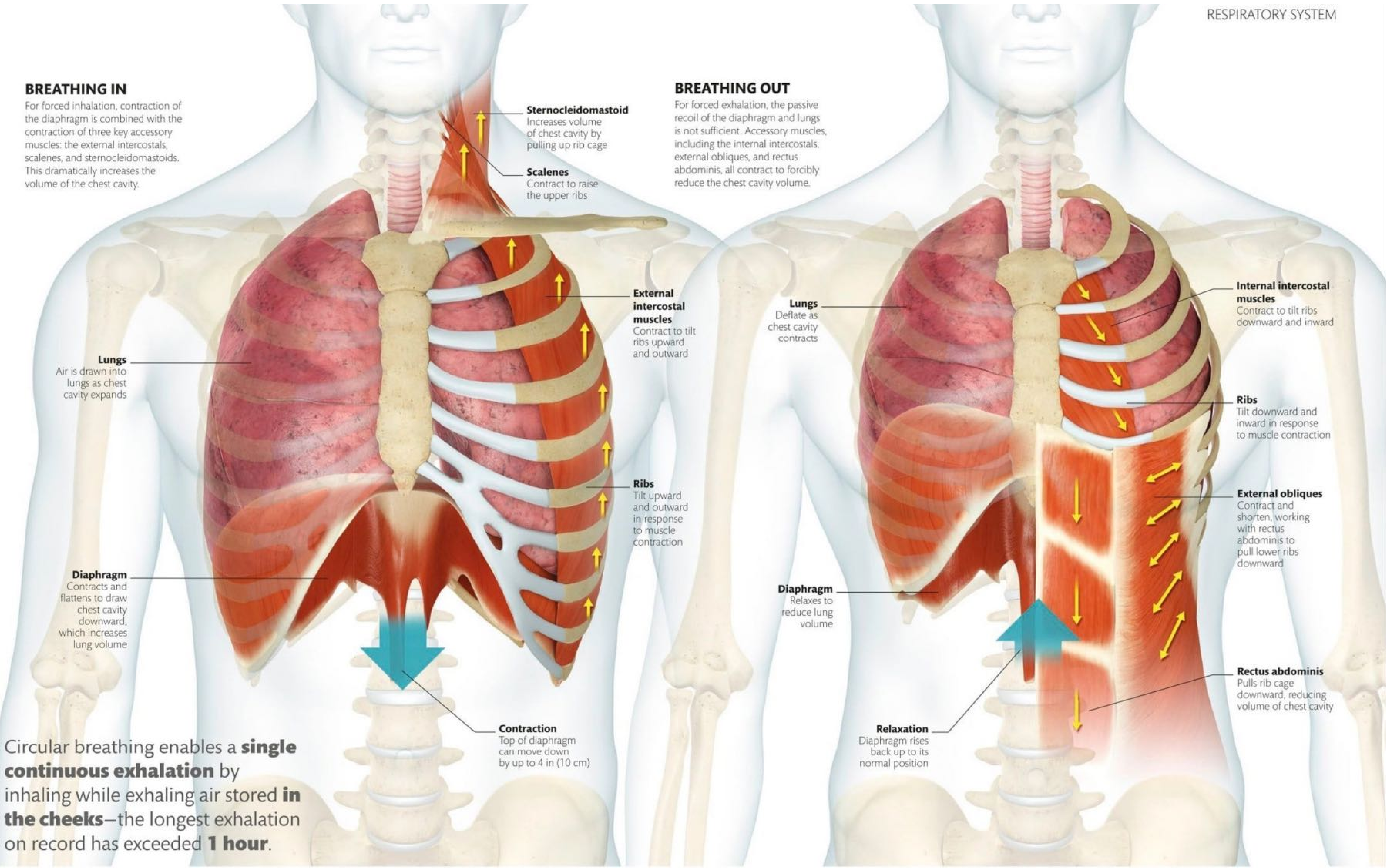
Collapsed lung
If air enters the pleural cavity it cancels the suction effect, causing the lung to collapse (pneumothorax).

BREATHING IN

For forced inhalation, contraction of the diaphragm is combined with the contraction of three key accessory muscles: the external intercostals, scalenes, and sternocleidomastoids. This dramatically increases the volume of the chest cavity.

BREATHING OUT

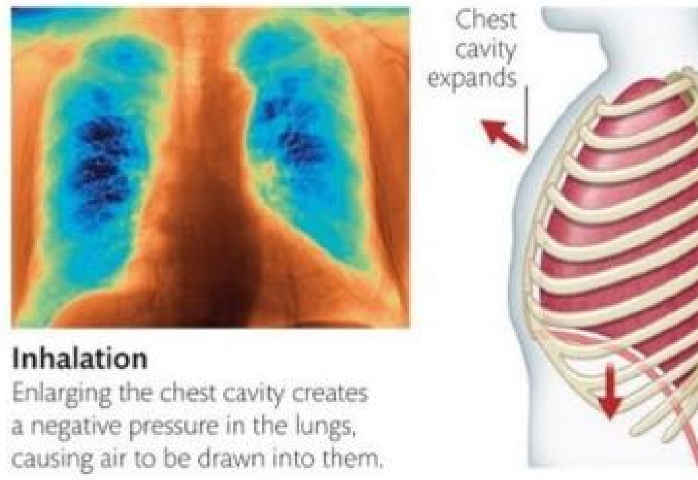
For forced exhalation, the passive recoil of the diaphragm and lungs is not sufficient. Accessory muscles, including the internal intercostals, external obliques, and rectus abdominis, all contract to forcibly reduce the chest cavity volume.



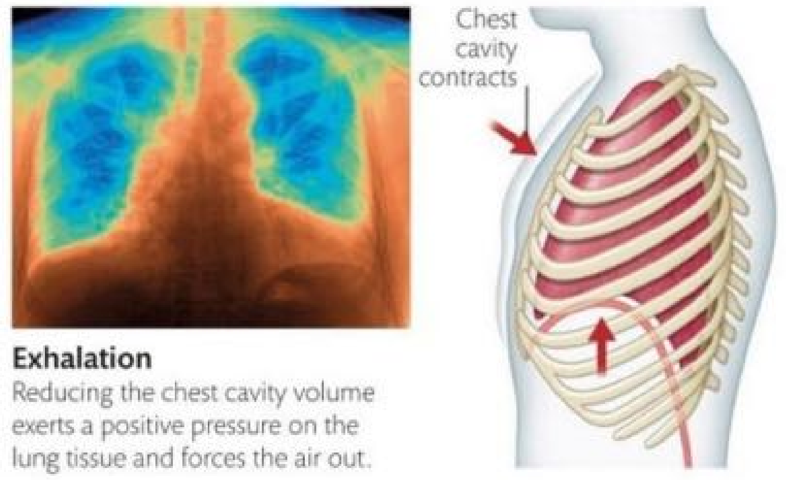
Circular breathing enables a **single continuous exhalation** by inhaling while exhaling air stored **in the cheeks**—the longest exhalation on record has exceeded **1 hour**.

NEGATIVE AND POSITIVE PRESSURE

The generation of "pressure gradients" is what causes air to move into and out of the lungs. When the muscles of inhalation contract to increase the volume of the chest cavity, the lungs, which are sucked onto the chest wall by the effect of pleural fluid, expand. This reduces the pressure in the lungs relative to that of the atmosphere and air flows down the pressure gradient into the lungs. For exhalation, the elastic recoil of the lungs compresses the air within them, forcing it out into the atmosphere.



Inhalation
Enlarging the chest cavity creates a negative pressure in the lungs, causing air to be drawn into them.

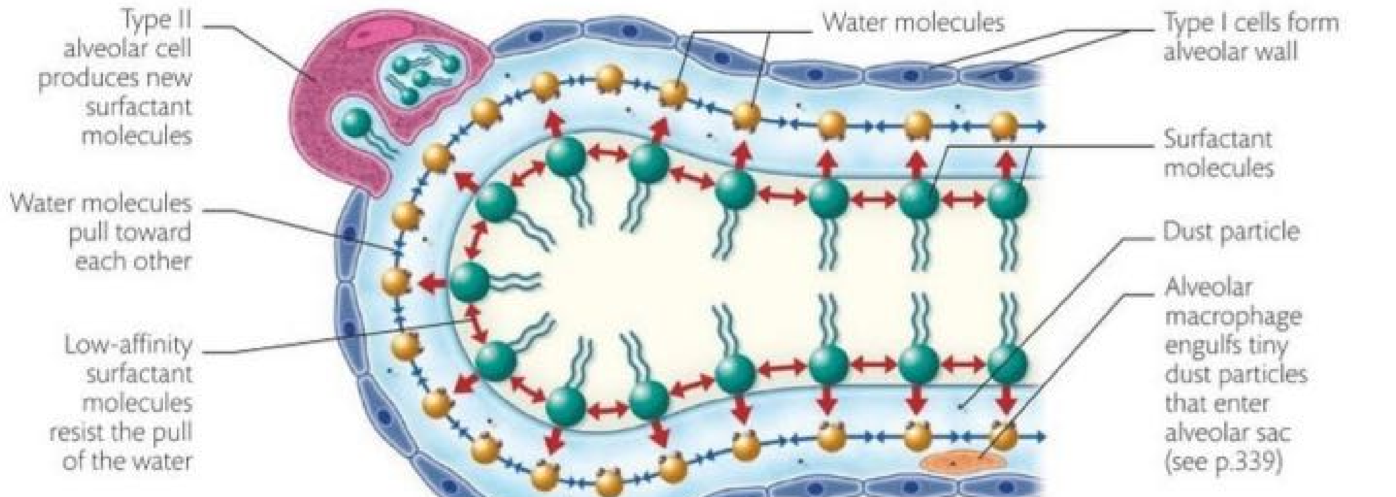


Exhalation
Reducing the chest cavity volume exerts a positive pressure on the lung tissue and forces the air out.

SURFACTANT

Cells lining the alveoli are coated with a layer of water molecules. These have a high affinity for each other, meaning that the water layer tries to contract and pull the alveolar cells together, like a purse string. To prevent the alveoli from closing under this pressure, a layer of surfactant spreads over the water surface. Oil-based surfactant molecules have a very low affinity for each other and can therefore counteract the pull of the water molecules, ensuring the alveoli remain open. Alveoli are made of two types of cell: Type I form the alveolar walls and Type II secrete surfactant.

Oily layer
A surfactant molecule's water-loving end dissolves in water; its fat-loving end forms a boundary with the air.



Muscles of the respiratory system

Scalenes

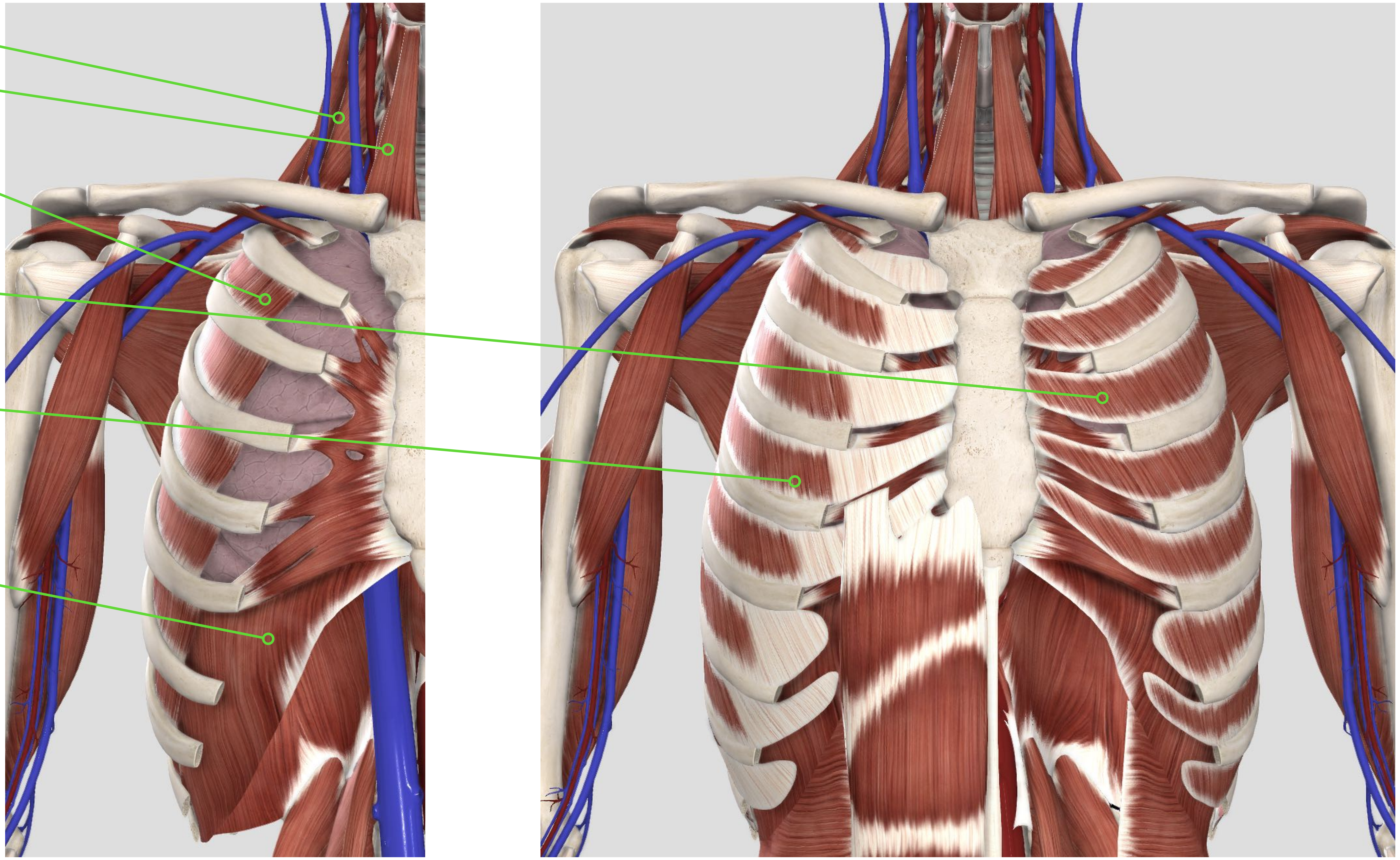
Sternocleidomastoids

Inner internal intercostals

Internal intercostals

External intercostals

Diaphragm



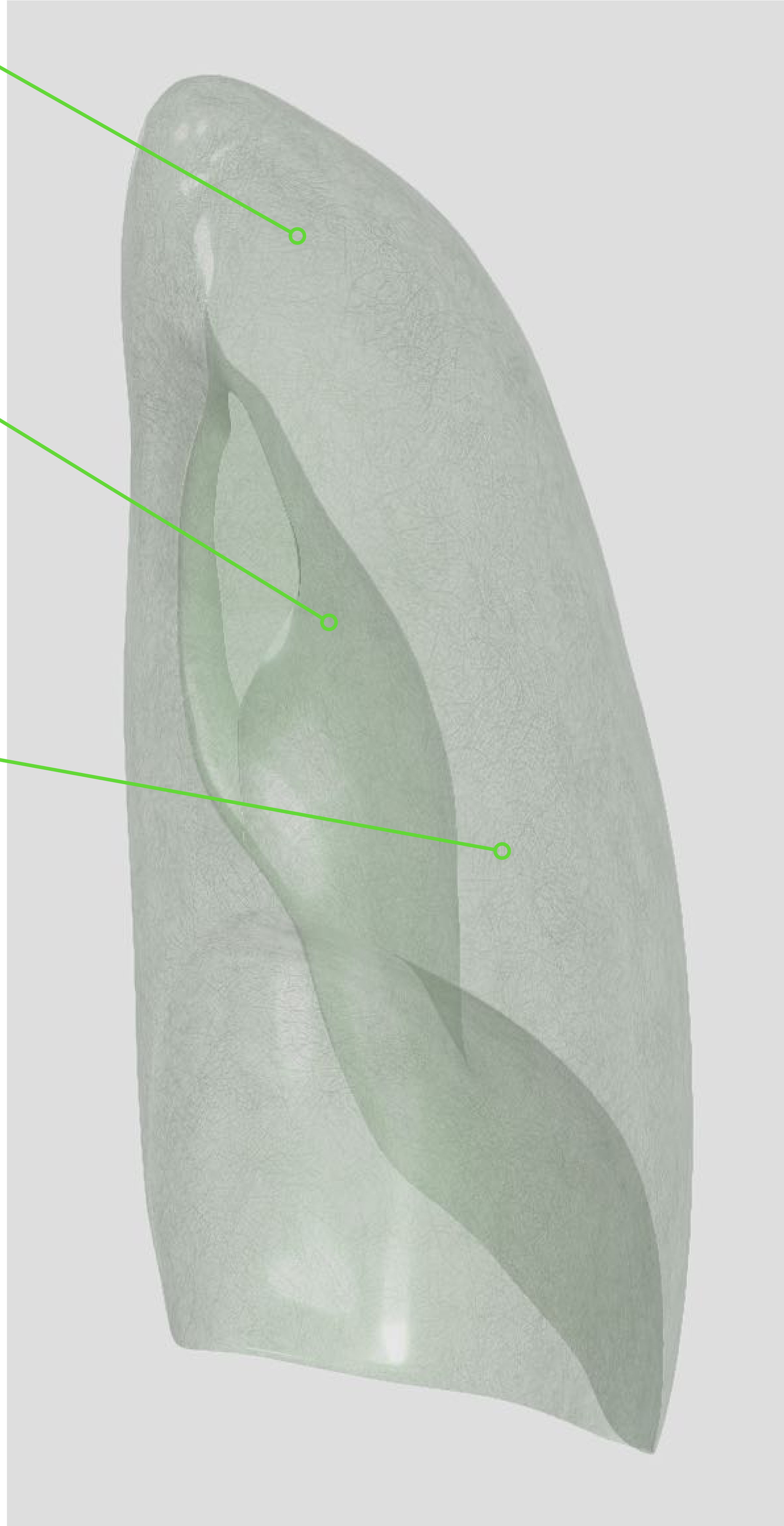
Pleuras

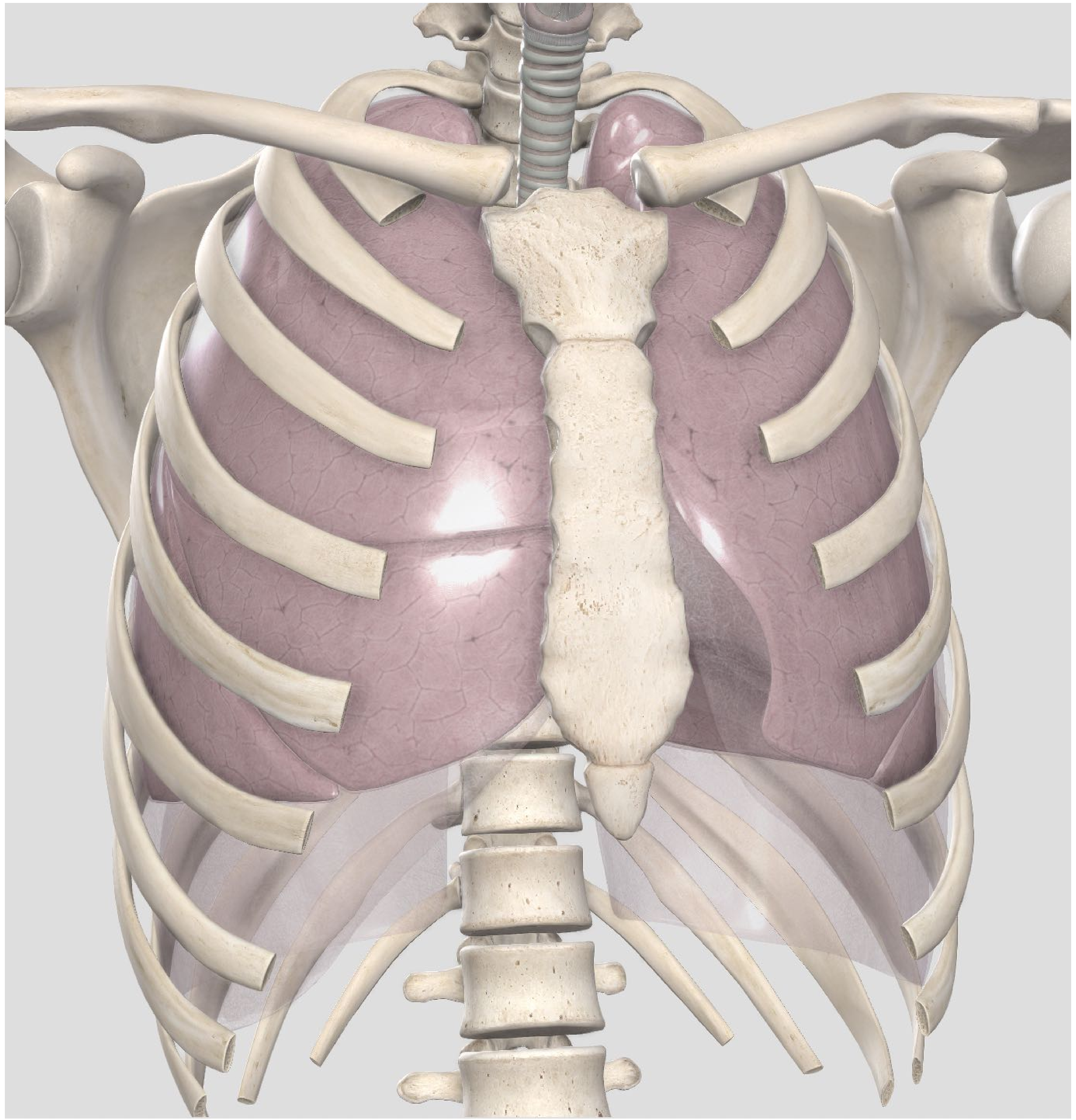
Outer parietal layer

Inner visceral layer

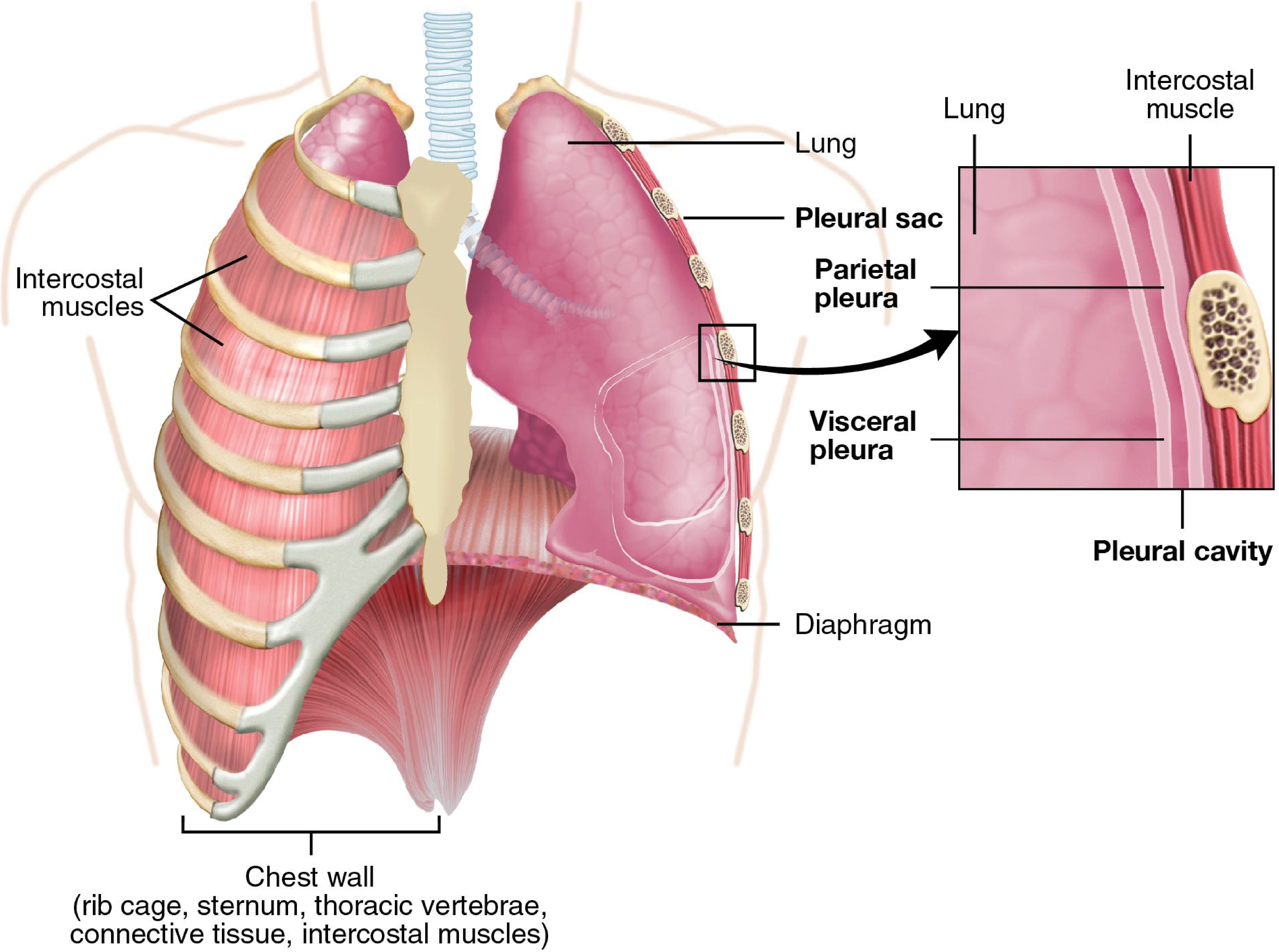
Pleural cavity

(serous fluid)





Pleuras


Intercostal muscles
Lung
Pleural sac
Parietal pleura
Visceral pleura
Diaphragm
Lung
Intercostal muscle
Pleural cavity
Chest wall
(rib cage, sternum, thoracic vertebrae, connective tissue, intercostal muscles)

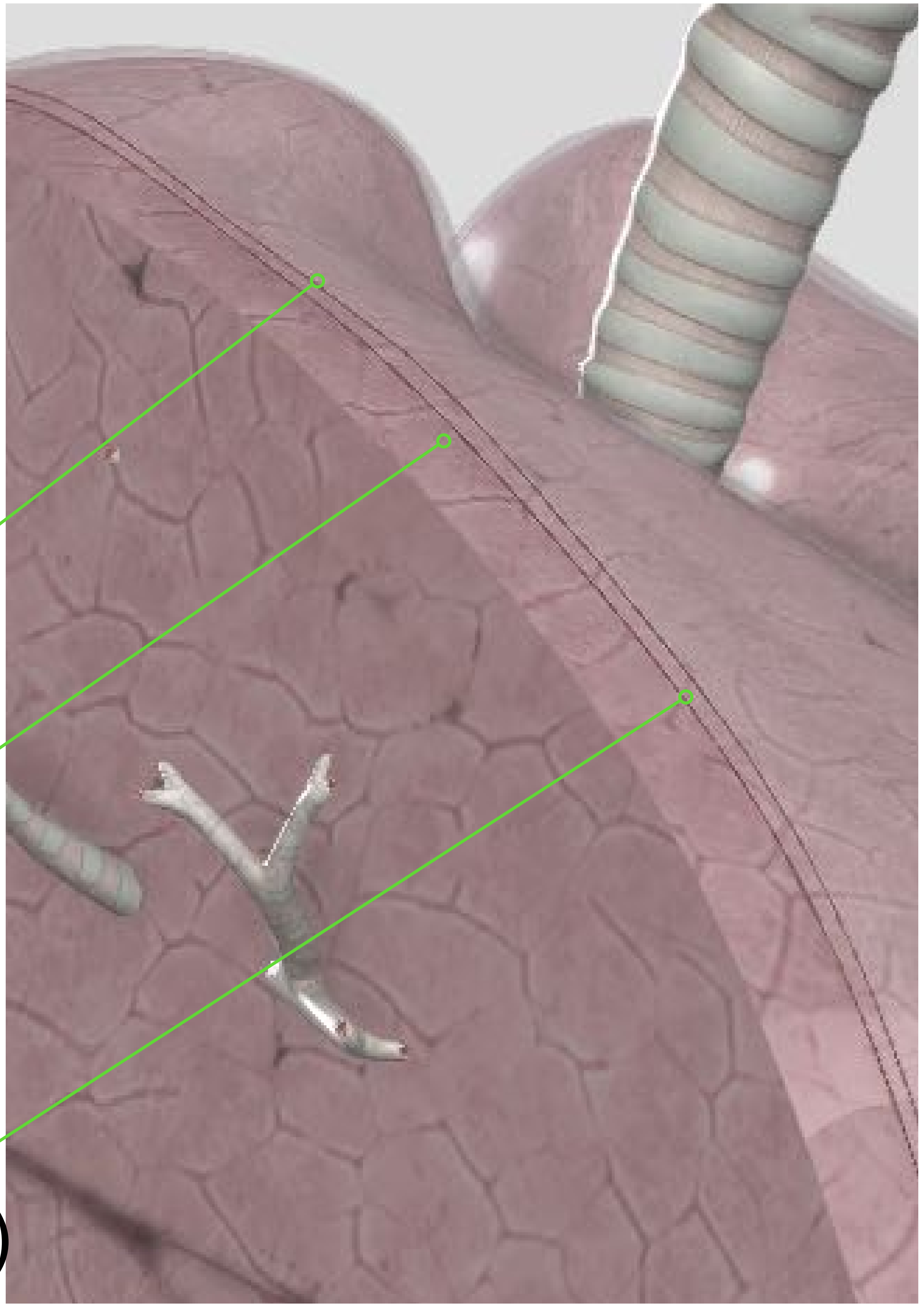
Pleuras

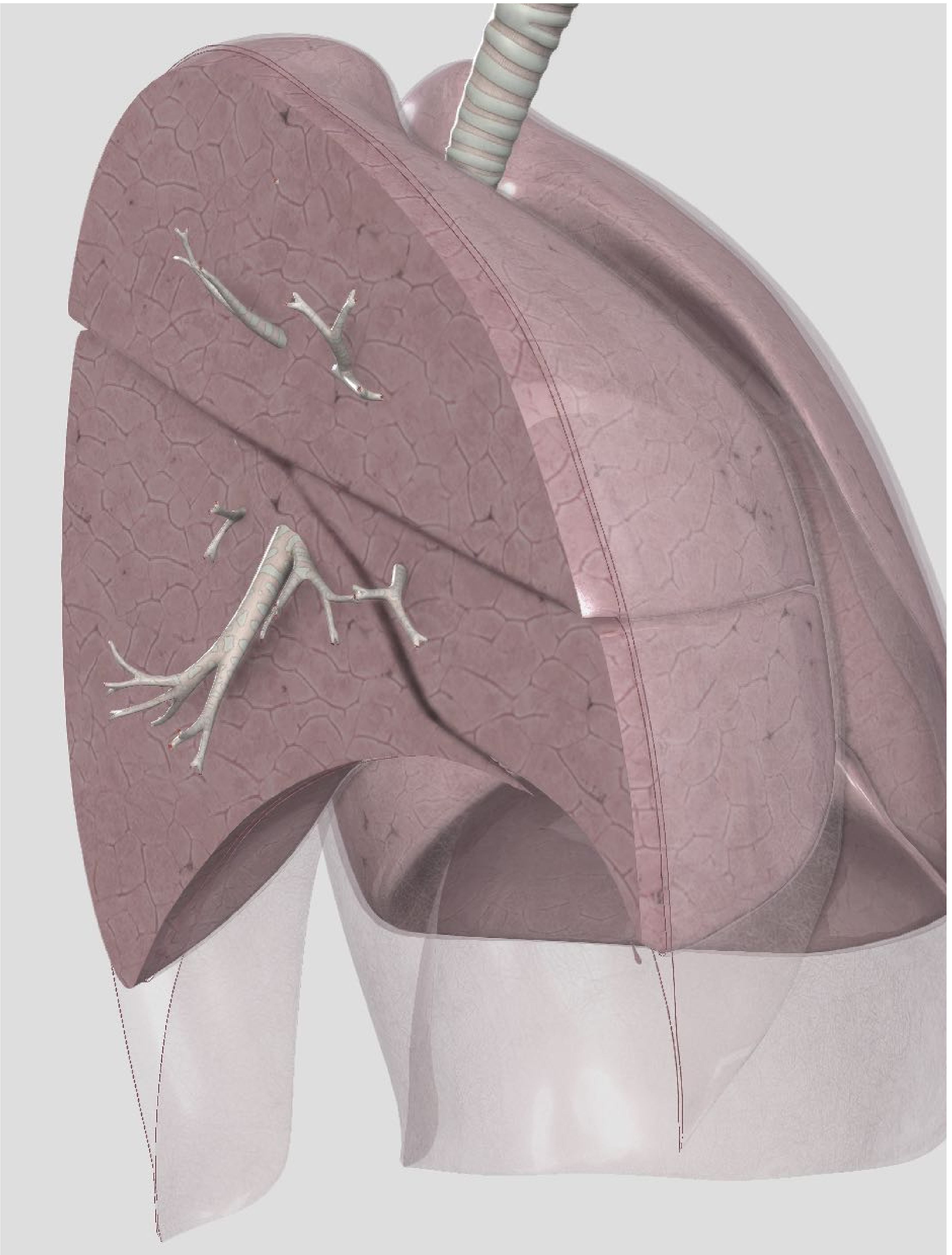
Outer parietal layer

Inner visceral layer

Pleural cavity with

pleural fluid (serous)





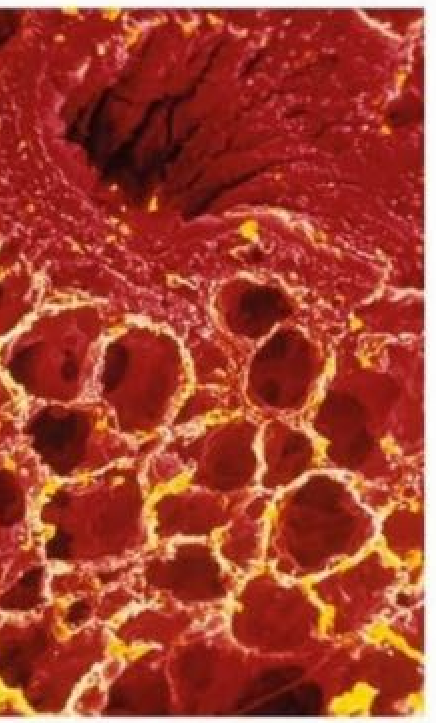
GAS EXCHANGE

Cells need a continual supply of oxygen that they combine with glucose to produce energy. Carbon dioxide is continually generated as a waste product of this process and is exchanged for useful oxygen in the lungs.

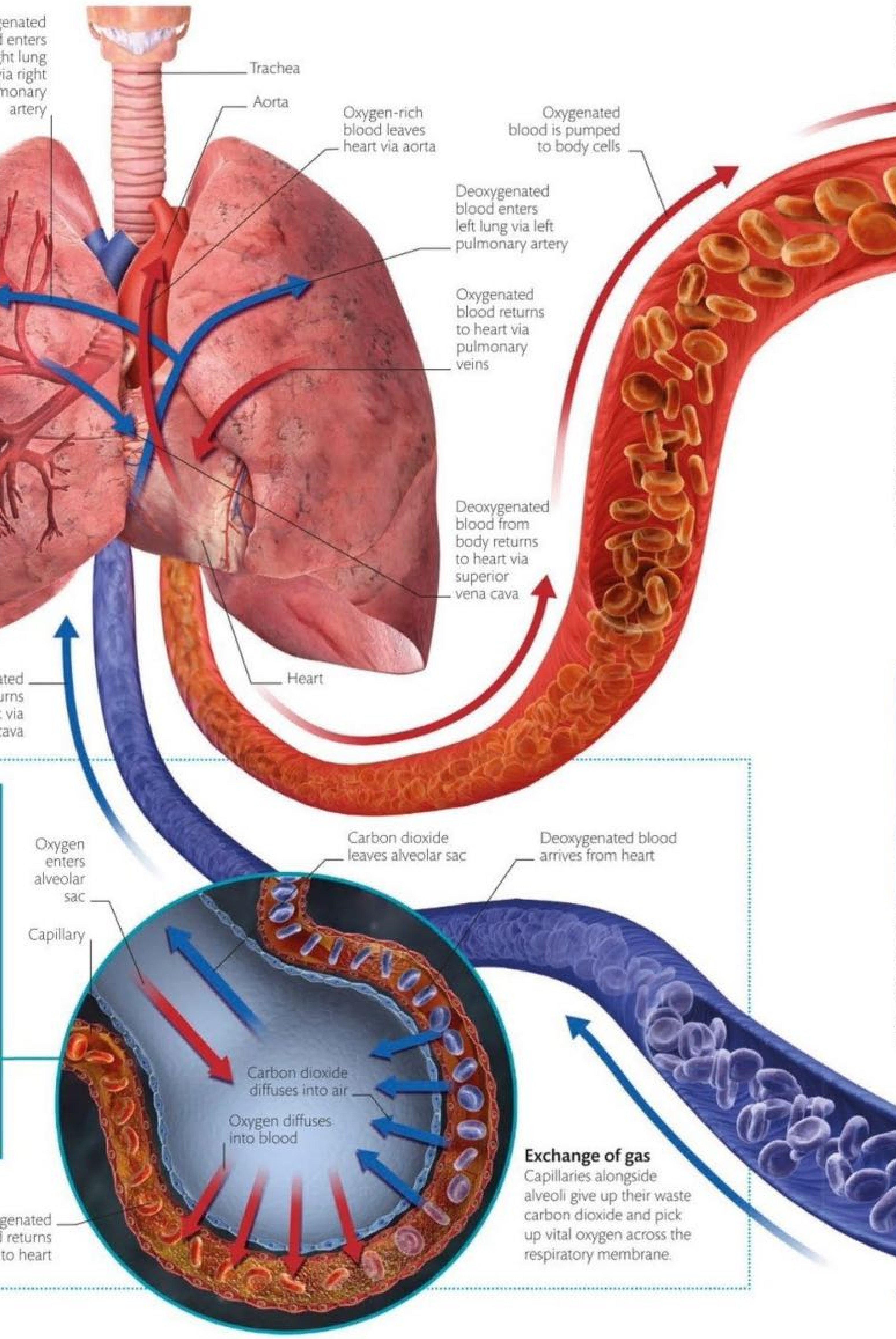
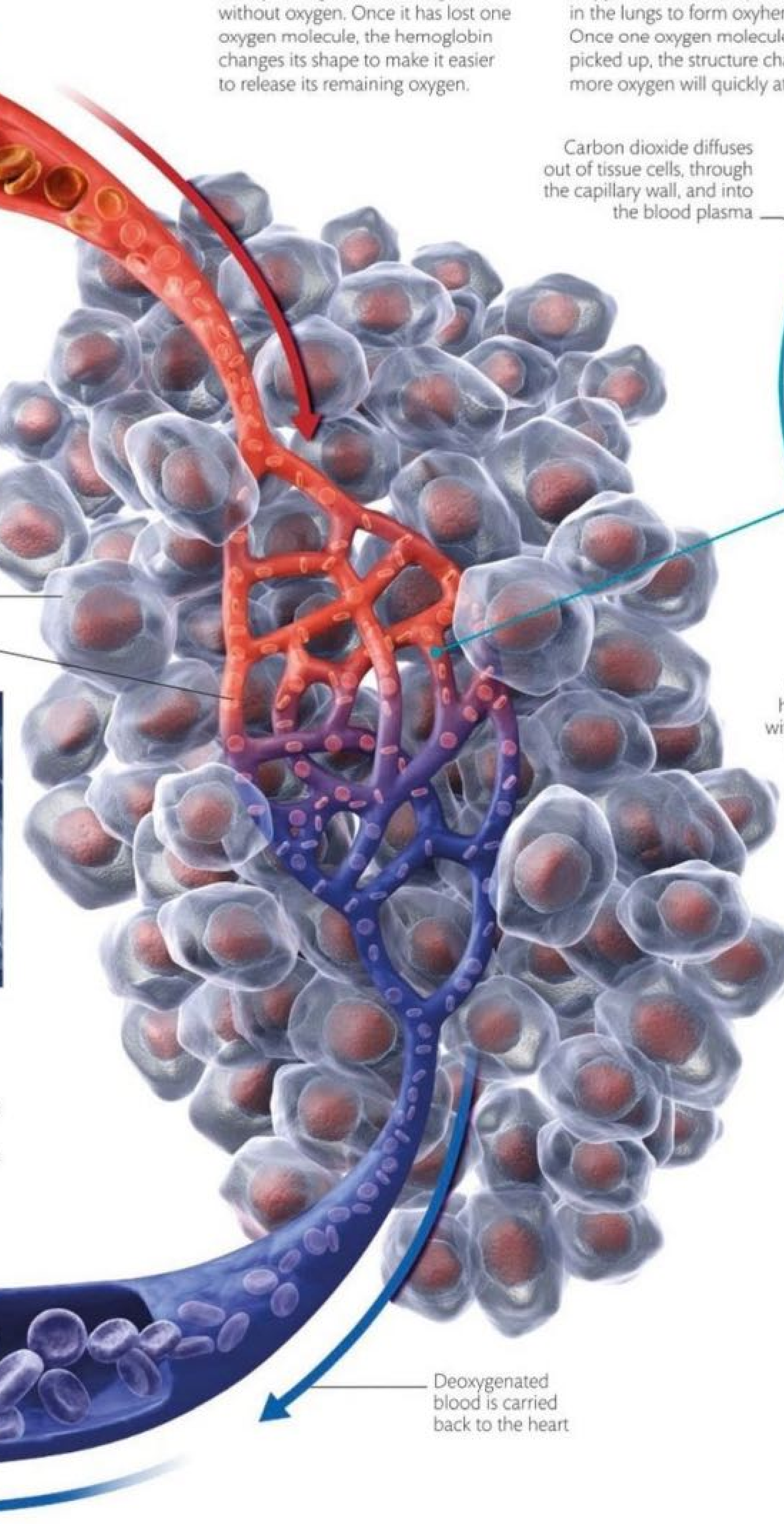
Hundreds of **millions** of **alveoli** provide a total **surface area** of 750 sq ft (70 sq m), over which gas exchange can take place.

PROCESS OF GAS EXCHANGE

The respiratory tract acts as a transport system, taking air to millions of tiny air sacs (alveoli) in the lungs where oxygen is traded for carbon dioxide in the bloodstream. This exchange of gases can take place only in the alveoli. However, during normal breathing, air is only drawn into and out of the respiratory tract as far down as the bronchioles. This means that the alveoli are not regularly flushed with fresh air and stale, carbon dioxide-rich air remains in them. Carbon dioxide and oxygen in the alveoli therefore have to change places by moving down a concentration gradient—the oxygen molecules migrate to the area where oxygen is scarce, while the carbon dioxide molecules migrate to the area where carbon dioxide is scarce. Using this process, known as "diffusion," oxygen enters the alveoli, and from there diffuses into the blood (see below), while carbon dioxide moves out of the alveoli and into the bronchioles, and is exhaled normally.



Lung tissue
A color-enhanced micrograph of a section of a human lung clearly displays the numerous alveoli, which form the site of gas exchange.

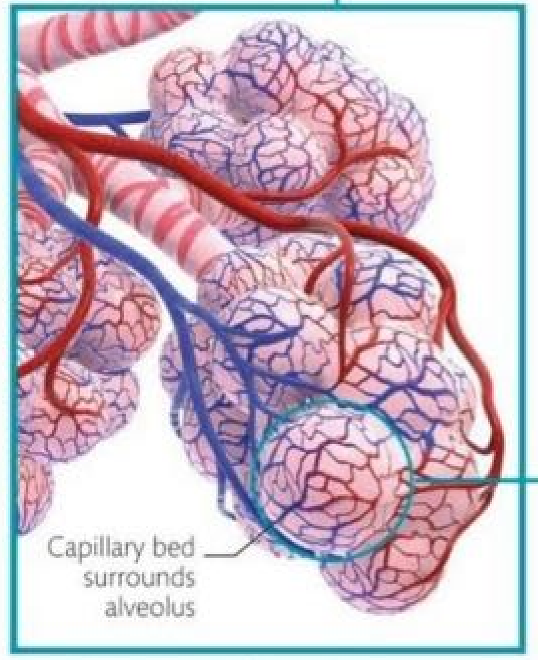



Essential supply
Oxygen absorbed in the lungs is taken in the blood to the left side of the heart, which pumps it through the body. When it reaches the capillaries, oxygen is exchanged for carbon dioxide. Carbon dioxide is then transported in the blood to the right side of the heart, which pumps it to the lungs to be exhaled.

Exchange of gas
Capillaries alongside alveoli give up their waste carbon dioxide and pick up vital oxygen across the respiratory membrane.

DIFFUSION FROM ALVEOLI

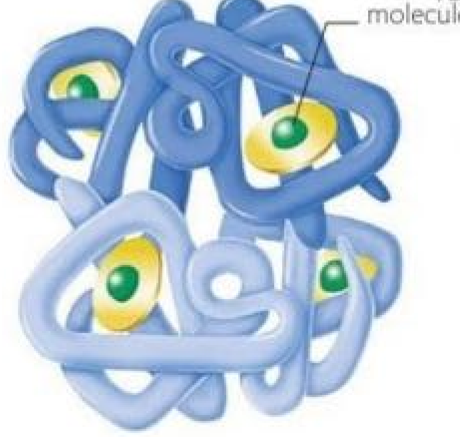
In human lungs there are nearly 500 million alveoli, each of which is around $^1/_{128}$ in (0.2 mm) in diameter. Taken together, the alveoli represent a large surface area over which gas exchange can take place. To move between the air and the blood, oxygen and carbon dioxide have to cross the "respiratory membrane," which comprises the walls of the alveoli and their surrounding capillaries. Both of these are just one cell thick, so the distance that molecules of oxygen and carbon dioxide must travel to get into and out of the blood is tiny. The exchange of gas through the respiratory membrane occurs passively, by diffusion, where gases transfer from areas of a high concentration to a low concentration. Oxygen dissolves into the surfactant (see p.343) and water layers of the alveoli before entering the blood, while carbon dioxide diffuses the opposite way, from the blood into the alveolar air.



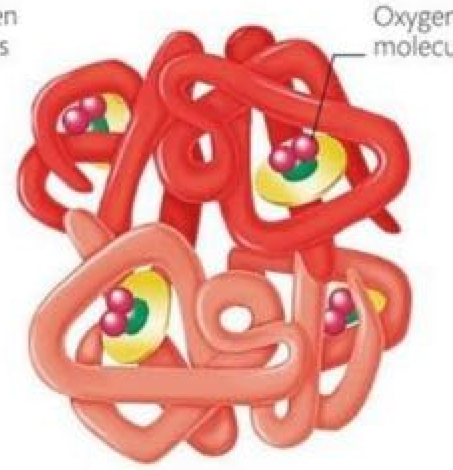
Respiratory membrane
The vast number of capillaries that surround the alveoli mean that up to 32 fl oz (900 ml) of blood can take part in gas exchange at a given time.

HEMOGLOBIN

Hemoglobin is found in red blood cells and is a specialized molecule for transporting oxygen. It is made up of four ribbon-like protein units, each containing a heme molecule. Heme contains iron, which binds oxygen to the hemoglobin and therefore holds it within the red blood cell (oxygenating the blood). When oxygen levels are high, for example in the lungs, oxygen readily binds to hemoglobin; when oxygen levels are low, for example in working muscle, oxygen molecules detach from hemoglobin and move freely into the body cells.



Deoxyhemoglobin
Deoxyhemoglobin is hemoglobin without oxygen. Once it has lost one oxygen molecule, the hemoglobin changes its shape to make it easier to release its remaining oxygen.

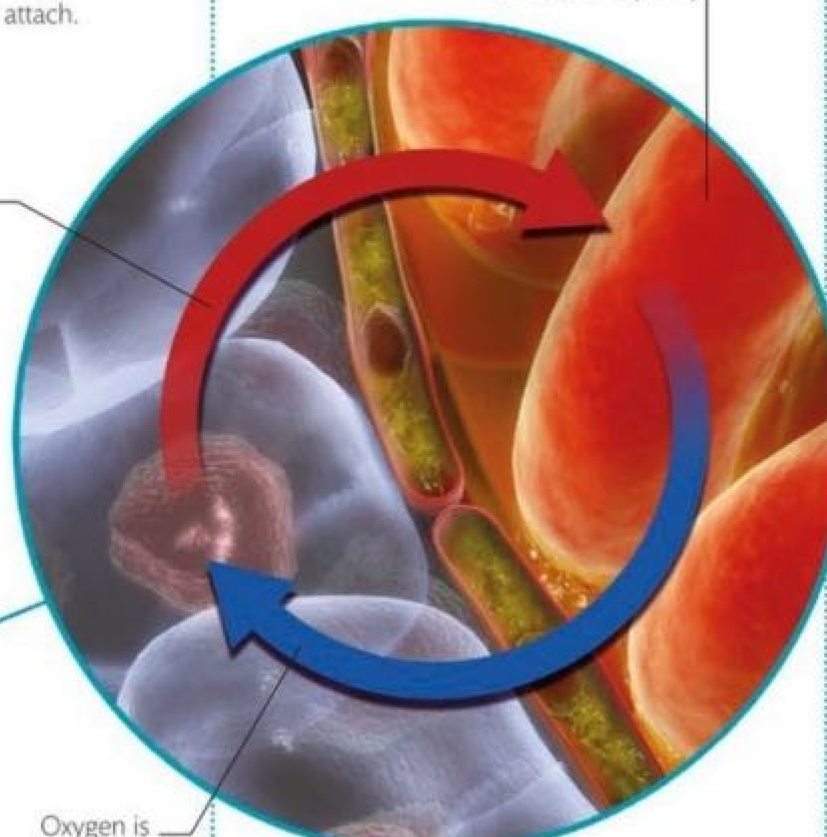


Oxyhemoglobin
Oxygen binds to deoxyhemoglobin in the lungs to form oxyhemoglobin. Once one oxygen molecule has been picked up, the structure changes so more oxygen will quickly attach.

Smoke inhalation
Inhaled smoke particles travel deep into the lungs. They damage the alveolar walls and cause them to thin and stretch. This results in the individual air sacs fusing, which reduces available surface area for gas exchange. Breathing difficulties can then arise in later life.

DIFFUSION INTO CELL TISSUES

Body cells constantly take in oxygen from hemoglobin (see left) and excrete their waste into the bloodstream. As a result, the concentration of oxygen in the capillaries is low, and the concentration of waste products is high; a situation that prompts hemoglobin to give up its oxygen. The free oxygen then diffuses into the cells, where it is used to create energy, while carbon dioxide diffuses out of the cells and into the blood. Hemoglobin picks up around 20 percent of this carbon dioxide, yet most returns to the lungs dissolved in plasma.



Capillary gas exchange
Blood flows through the capillaries, where hemoglobin releases oxygen, and carbon dioxide dissolves in plasma to be taken back to the lungs.

THE BENDS

Divers breathe pressurized air, which forces more nitrogen than usual to dissolve into the blood (see p.338). If they ascend too fast, nitrogen forms gas bubbles in their blood, blocking the vessels and causing widespread damage, known as "the bends." Treatment is to redissolve the bubbles in a decompression chamber until nitrogen levels return to normal.

Pressures

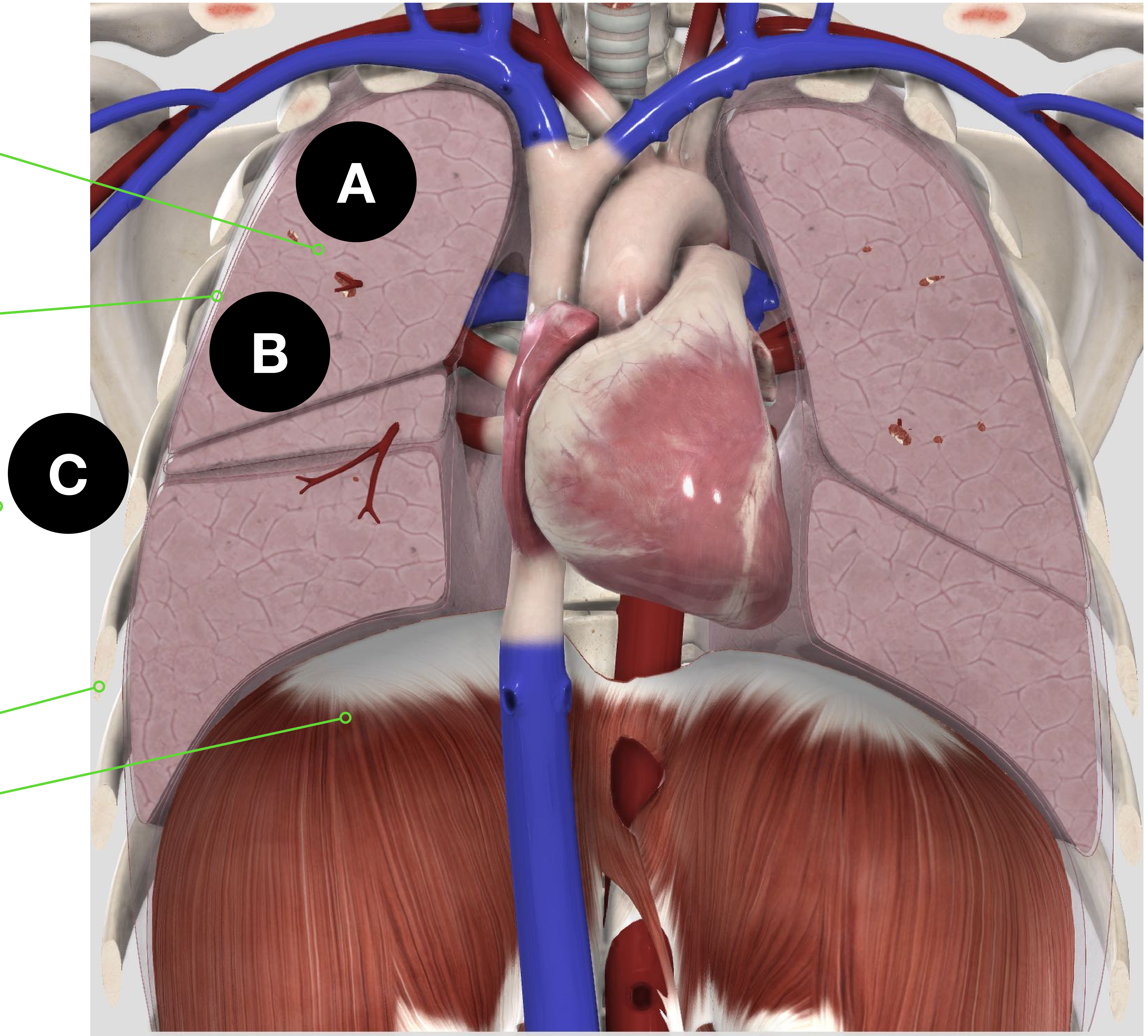
A = Intra pulmonary pressure
Pressure in the alveoli

B= Intra pleural pressure
Pressure between the pleura

C = Atmospheric pressure
or Barometric pressure
Pressure outside the body

Ribs with intercostals

Diaphragm



Pressures

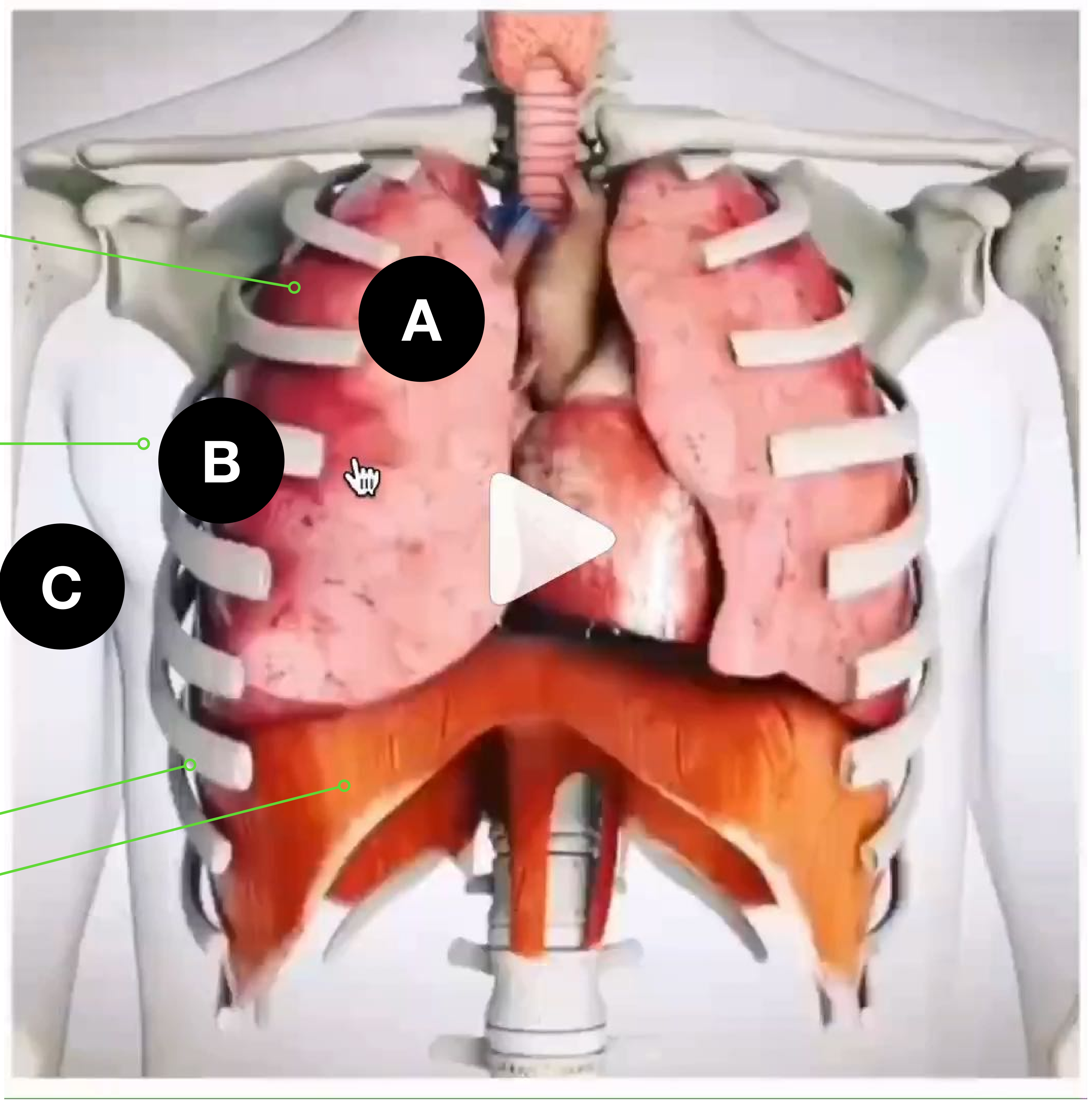
A = Intra pulmonary pressure
Pressure in the alveoli
(Intra-alveolar pressure).

B= Intra pleural pressure
Pressure between the pleura

C = Atmospheric pressure
or Barometric pressure
Pressure outside the body

Ribs with intercostals

Diaphragm



Pressure difference & Boyles law

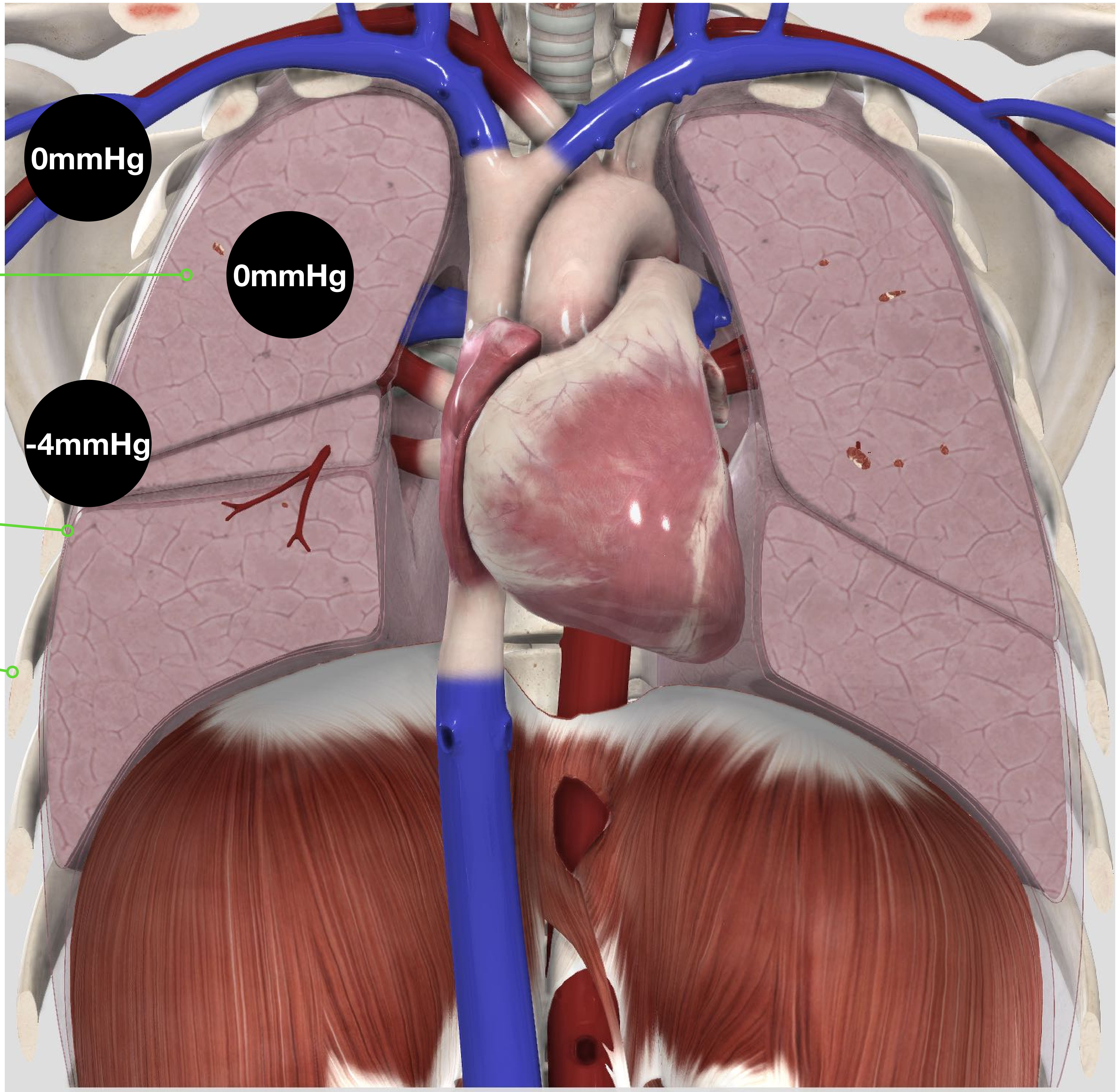
Yoga Education Collective

Intrapleural pressure difference owing to:

1. Elasticity of the lungs

2. Surface tension

3. Elasticity of the thoracic cage



Boyle's Law:
When there is an increase in pressure there is a decrease in volume.
P↑ V↓

Boyle’s Law

1. Boyle's law is often used as part of an explanation of how the breathing system works in the human body in conjunction with the external environment

2. Air must flow in to equalize the pressure within the lungs to the atmospheric pressure outside the body

3. Simply put this means that when the thoracic cavity expands the volume increases and the atmospheric pressure within the lungs decreases

Boyle's Law

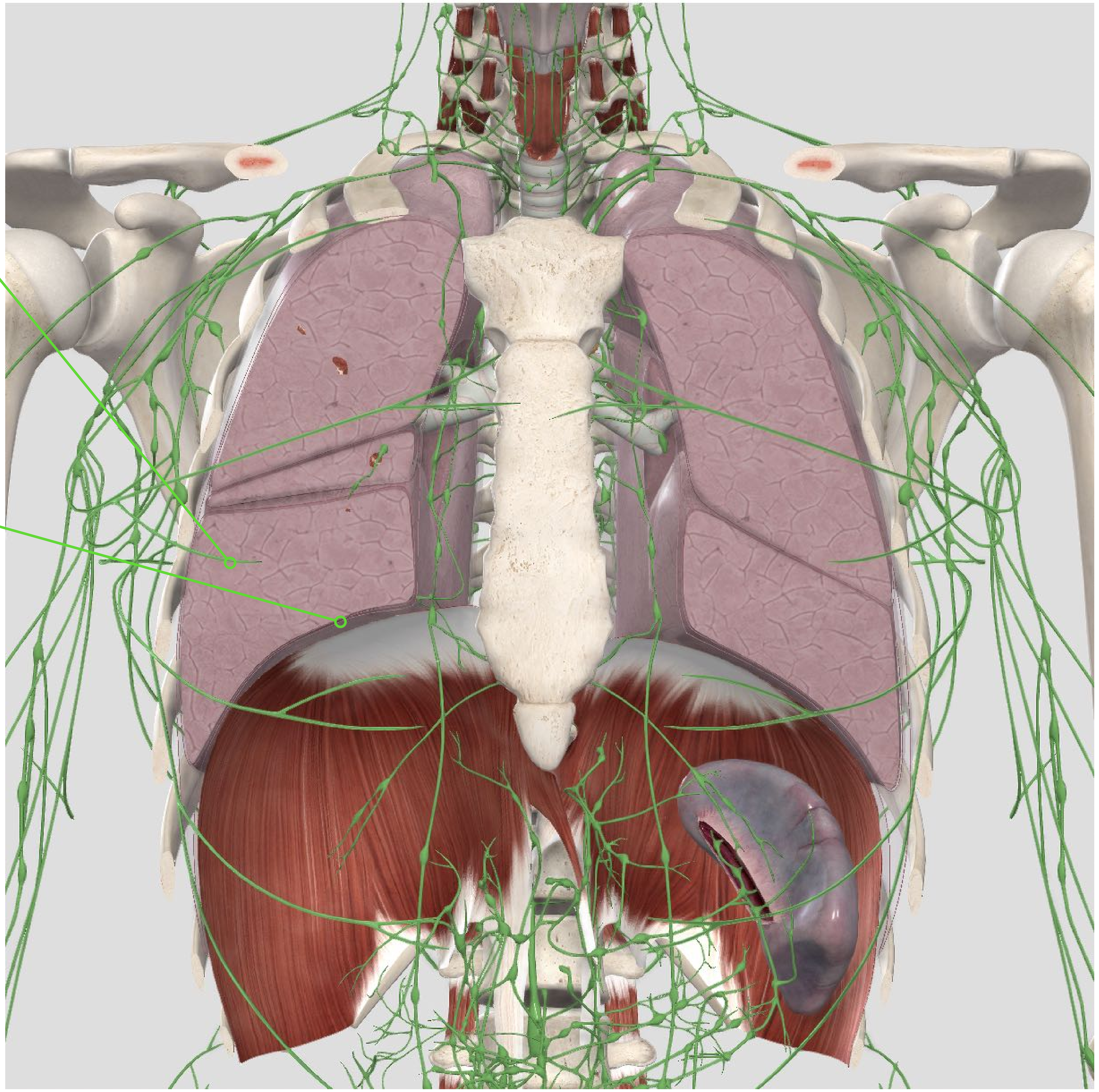
1. The opposite occurs on the exhalation
2. When the thoracic cavity contracts the volume decreases and the atmospheric pressure within increases
3. Air must flow out to equalize the pressure within the lungs to the atmospheric pressure outside the body
    1. **More space - Oxygen in**
    2. **Less space - Carbon dioxide out**

Boyle's Law states that a fixed mass of an ideal gas kept at a fixed temperature, pressure and volume are inversely proportional (reference)

Lymphatic drainage & gravity

Lymphatic fluid is constantly being drained from the intrapleural cavity to help maintain pressure balance

Gravity tends to pull the diaphragm downwards and the pressure in the the intrapleural cavity is thus not uniform throughout.



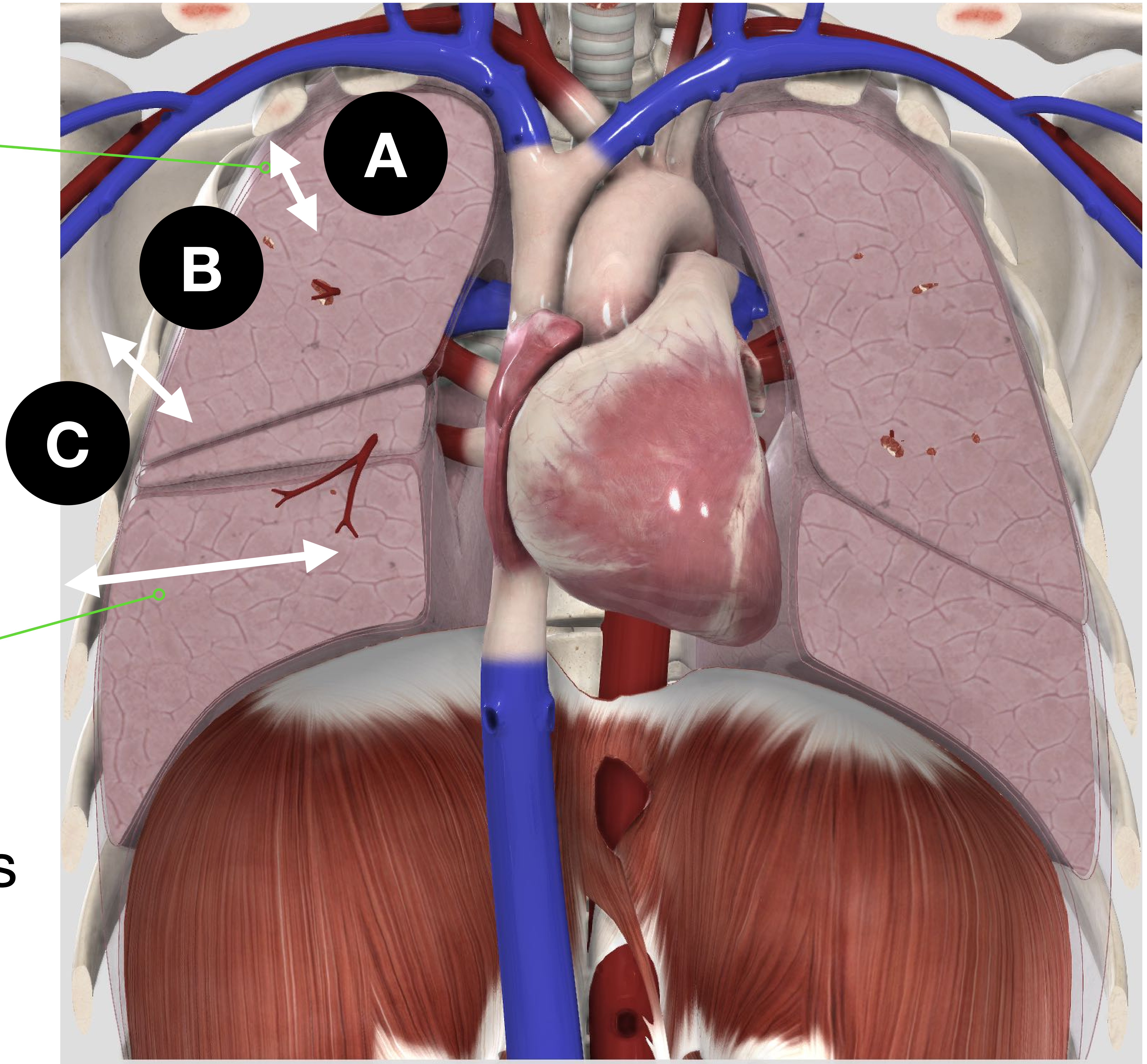
Pressure across membranes

A = Transpulmonary pressure.
Between intrapulmonary and intrapleural pressures

B = Transthoracic pressure.
Between intrapleural and atmospheric pressure

From A to C
Transrespiratory pressure

At rest no change in these pressures



Prana equals Life!

“The inert body of a person and the awareness that is the vital essence of their life are both dependent on the course of their breathing.
They grow or decay according to it.
The course of a person's breath keeps their inner vibrations in order.
By controlling our breath through the practice of yoga,
it is possible to gain access to the breath of the
Paramatman (Supreme Reality) and,
by this means, perform such actions as can uplift
our own Self as well as humanity."

Pujyasri Chandrasekharendra Sarasvati Svami

References

1. https://3d4medical.com The App used in the Lessons.

   Illustrations used in the slides are from **Complete Anatomy** by Elsevier unless otherwise noted

2. https://en.wikipedia.org/wiki/Main_Page

3. https://www.ninjanerd.org

   Respiration: https://www.ninjanerd.org/lecture-category/respiratory

4. Crash Course in Anatomy & Physiology: YouTube channel: https://www.youtube.com/watch?v=uBGl2BujkPQ

   Crash Course in Anatomy & Physiology: Respiration

   Part 1: https://youtu.be/bHZsvBdUC2I Part 2: https://youtu.be/Cqt4LjHnMEA

5. https://www.alilamedicalmedia.com

6. https://teachmeanatomy.info

7. https://elitehrv.com

References

1. https://3d4medical.com The App used in the Lessons.
   Illustrations used in the slides are from **Complete Anatomy** by Elsevier unless otherwise noted

2. https://en.wikipedia.org/wiki/Main_Page

3. https://www.ninjanerd.org
   Respiration: https://www.ninjanerd.org/lecture-category/respiratory

4. Crash Course in Anatomy & Physiology: YouTube channel: https://www.youtube.com/watch?v=uBGl2BujkPQ
   Crash Course in Anatomy & Physiology: Respiration
   Part 1: https://youtu.be/bHZsvBdUC2I Part 2: https://youtu.be/Cqt4LjHnMEA

5. https://www.alilamedicalmedia.com

6. https://teachmeanatomy.info

7. https://elitehrv.com

8. The Complete Human Body. Dr. Alice Roberts Dorling Kinsley

ॐ सर्वे भवन्तु सुखिनः
सर्वे सन्तु निरामयाः ।
सर्वे भद्राणि पश्यन्तु
मा कश्चिद्दुःखभाग्भवेत् ।
ॐ शान्तिः शान्तिः शान्तिः ॥

om̩ sarve bhavantu sukhinaḥ
sarve santu nirāmayāḥ
sarve bhadrāṇi paśyantu
mā kaścid duḥkha bhāgbhavet
om̩ śāntiḥ śāntiḥ śāntiḥ

May all be happy, may all be free from disease, may all see goodness,
may none suffer from sorrow.

ॐ असतो मा सद्गमय ।
तमसो मा ज्योतिर्गमय ।
मृत्योर्मा अमृतं गमय ।
ॐ शान्तिः शान्तिः शान्तिः ॥ हरिः ॐ तत्सत् ॥

asato mā sadgamaya
tamasomā jyotir gamaya
mrityormāamritam gamaya
Oṁ śhānti śhānti śhāntiḥ harih om tat sat

Lead me from changing existence to unchanging being,
lead me from the darkness of tamas to the light of knowledge,
lead me from death to immortality. Harih om that is truth.