The Lower Respiratory Tract

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LUNGS
The lungs are the primary organ in the respiratory system and part of the lower respiratory tract. Humans have two lungs, one on the right side of the thoracic cavity with three lobes and one on the left side with two lobes. The right lung is bigger and heavier than the left lung, which shares space in the chest with the heart. The lungs weigh about 2.9 lbs/1.3k. They extract oxygen from the air and transfer it into the bloodstream to nourish the body. Then, in a gas exchange, release carbon dioxide from the bloodstream into the atmosphere.

Lack of oxygen to the brain causes anoxic brain injury or cerebral hypoxia (brain injury). Generally, the human body cannot live more than 3 minutes without air. Science Alert and Live Science reported some of the limits of human survival.

According to Spinal Cord, deprivation of air for two minutes risks brain damage, whereas three to four minutes make it inevitable. The long-term effects of cerebral hypoxia can include

- Damage to specific areas of the brain. The prognosis depends on which areas are damaged. For instance, severe damage to regions of the brain that govern speech and language may lead to aphasia.
- A coma. Loss of consciousness may give the brain time to heal, but if permanent, patients enter a persistent vegetative state.
- Epilepsy (persistent seizures).
- Damage to motor skills, fine motor skills (dexterity) in particular. Sometimes this damage is localized to just one region or side of the body.
- A stroke or death
- Cardiovascular episodes.
- Birth-defects. Hypoxia is a relatively common birth injury, and newborns who suffer prolonged oxygen deprivation during birth may suffer chronic diseases such as cerebral palsy.

With all the environmental madness today, our lower respiratory tract is being assaulted like never before. Babies and children are injected with and exposed to massive amounts of toxins. Millions of tons of toxic chemicals are sprayed on our food supply; in our housing communities; on school grounds, public parks, open spaces, farmland, and in the sky via weather geoengineering and chemtrails. 5G towers, power boxes, antennas, wifi routers and devices, and satellites radiate EMFs everywhere, including in new, not-so-smart-homes. Millions of tons of toxins are disposed into waterways and oceans and under the guise of dental health, into our water supplies. Junk food loaded with refined carbs, sugar, damaged oils, and GMOs are hard to avoid, especially when eating out.

In addition to damaging the lower respiratory tract, many of these pollutants are neurotoxins and endocrine disruptors. They also deplete nutrients or hinder nutrient absorption. It is no wonder chronic childhood diseases and male/female gender birth-defects are increasing at an alarming rate.

Instead of protecting public health, government regulatory agencies and politicians protect the polluting industries that contribute high amounts of money to their coffers. Major conflicts of interest are rampant among the agencies and government leaders who are supposed to protect the public. This needs to stop! Plus, Members of Congress/Parliament need to stop funding (with our tax money) polluting covert operations such as weather geoengineering, covert military operations, and warfare.

A damaged lower respiratory tract hinders breathing and weakens the immune system. This leads to a multitude of ailments such as allergies, asthma, bronchitis, pneumonia, COPD, (chronic obstructive pulmonary, emphysema, chronic bronchitis), bronchiectasis, lung cancer, smokers cough, cystic fibrosis, ALS (amyotrophic lateral sclerosis or Lou Gehrig's disease), autoimmune diseases, edema, high blood pressure, heart and kidney failure, or hormonal imbalances.

Exposure to high levels of EMFs is deadly for a person with a respiratory or lung disease. To learn how to protect yourself from subatomic chaotic EMF radiation, read *Solutions for EMFs* in this (April '23) issue of Masters of Health magazine and go to EMF Solutions. Just because we cannot see, hear, or smell some pollutants does not mean they are not harmful.

Symptoms from a lower respiratory tract infection or damage can include fever, chills, cough (dry or with mucus), sneezing, congestion, headache, shortness of breath, chest tightness, fatigue, sore throat, difficulty swallowing, muscle aches, nausea and vomiting, loss of appetite, lymphatic congestion, edema, a cold, flu, or rash. Mucus (sputum) that is brownish, yellow, or green indicates an infection that needs immediate proper treatment.

Mucus helps trap foreign invaders, but thick or sticky mucus from an infection can clog the airways, making breathing hard. When consuming refined sugar and carbs, extra mucus forms to deal with the unfriendly bacteria created. The common cold starts as catarrh or a sore throat (tonsils are the first line of defense). If not addressed, the infection expands into the respiratory tract, which can be deadly to a child or someone immune-compromised or elderly.

Branching airways of the lower respiratory tract are often described as the respiratory tree or tracheobronchial tree. The lower respiratory tract consists of

1. Trachea
2. Mainstem bronchus
3. Lobar bronchus
4. Segmental bronchus
5. Bronchiole

6. Alveolar duct
7. Alveolus
8. Lungs

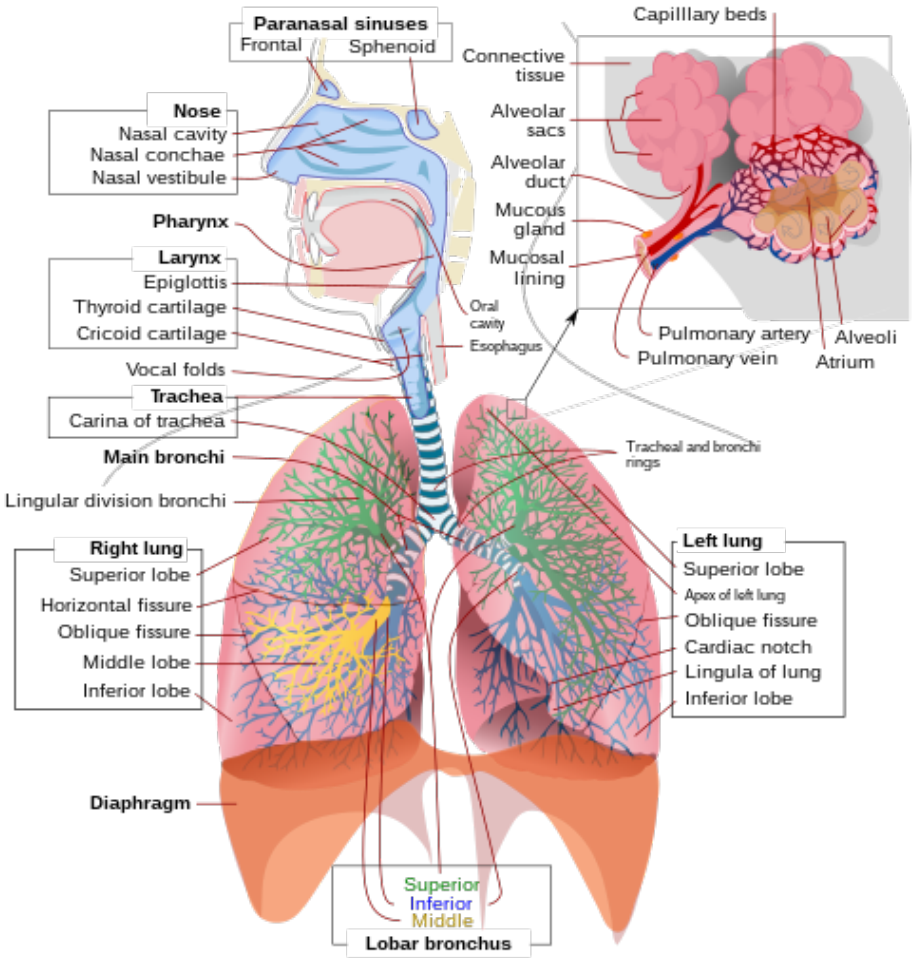


Fig. 1. A complete, schematic view of the human upper and lower respiratory system with their parts and functions. (Wikipedia)

We all know about the harm of smoking, a sugary junk food diet, and damaged oils, but there is little attention on the other culprits. They include EMFs, toxic metals and chemicals, pharmaceuticals, and gain-of-function of biological weapons disseminated into our environment and bodies via drones, chemtrails/weather geoengineering, water and food supply, experimental vaccines, and flu shots.

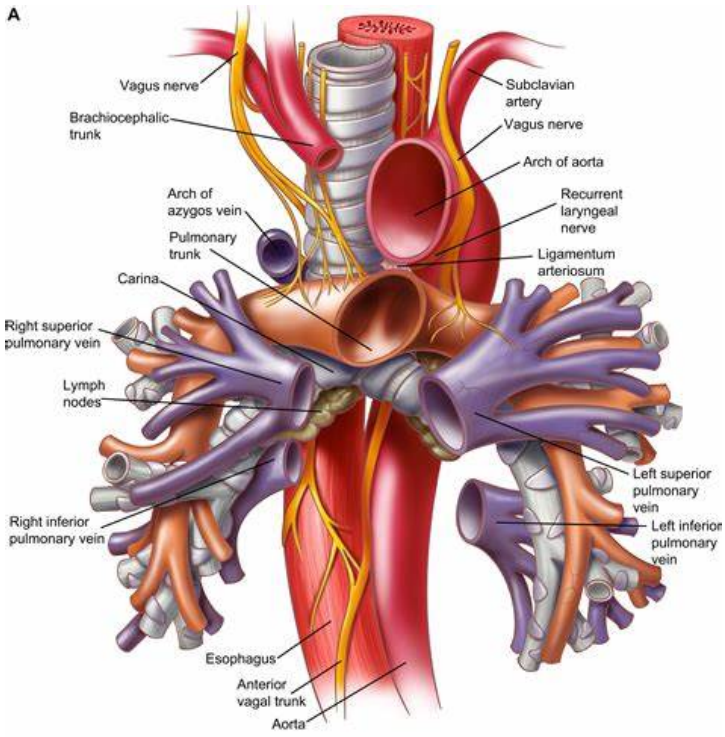
Military bases and centers are among the worst offenders. Their reckless projects produce GM viruses, parasites, fungi, toxic metals and chemicals, PFAS/PFOS, DU, radiation, and nanorobotics or nano-bots that do not belong in our bodies or environment. They all greatly damage the lower respiratory tract. And, since everything is connected, the whole body suffers and is damaged over time.

TRACHEA/WINDPIPE

The trachea is a cartilaginous tube that connects the larynx to the bronchi of the lungs. It enables air to pass through on its way to or from the lung alveoli, which transmits oxygen into the body and removes carbon dioxide. The trachea has horseshoe rings joined vertically by overlying ligaments and the trachealis muscle at their ends. The opening to the larynx is closed during swallowing by the epiglottis. The trachea branches into the two primary bronchi and is epithelium lined with column-shaped cells that have hair-like extensions called cilia. It also has scattered goblet cells that produce protective mucins.

Inflammation from a viral illness affecting other parts of the respiratory tract, such as the bronchi (called croup that appears as a barking cough), can affect the trachea. Bacterial infections that affect the trachea can cause narrowing or obstruction, preventing air to the lungs.

Fig. 2 **Anatomy of the Trachea** and the excerpt below from Wikipedia reveals how complex and interconnected everything is.



Blood and Lymphatic Supply

The upper part of the trachea receives and drains blood through the inferior thyroid arteries and veins;[2] the lower trachea receives blood from bronchial arteries.[3] Arteries that supply the trachea do so via small branches that supply the trachea from the sides. As these branches approach the wall of the trachea, they split into inferior and superior artery branches that join with artery branches above and below; these then split into artery branches that supply the anterior and posterior parts of the trachea.[3] The inferior thyroid arteries arise just below the isthmus of the thyroid, which sits atop the trachea. These arteries join (*anastomoses*) with ascending branches of the bronchial arteries, which are direct branches from the aorta, to supply blood to the trachea.[2] The lymphatic vessels of the trachea drain into the pretracheal nodes that lie in front of the trachea and paratracheal lymph nodes that lie beside it.[2]

BRONCHUS

At the end of the trachea, the *carina* divides into two primary bronchi; the right goes into the right lung, and the left into the left lung. This junction begins at the level of the fifth thoracic verterbra. The bronchi contain cartilage, smooth muscles, and mucous membranes. Cartilage keeps the bronchi from collapsing during inhalation and exhalation. As the bronchi subdivide into smaller bronchi, the amount of cartilage decreases, and the number of smooth muscles increases.

The bronchus is the passageway that conducts air into the lungs. It forms many branches from the primary bronchi, which are wide at the top and narrow as they go from the mainstem, lobar, to lobar. Bronchioles are narrow branches without any cartilage.

Like the trachea, these bronchioles have respiratory epithelium linings, classified as ciliated pseudostratified columnar epithelium. The epithelium in the main bronchi contains glandular goblet cells and modified simple columnar epithelial cells that produce mucins, the main component of mucus. No gas exchanges take place in the

bronchi. Their purpose is to deliver air into the lungs. The bronchi vessels divide into bronchioles (internal airways of the lungs), terminal bronchioles, respiratory bronchioles, alveolar sacs, and alveoli, where the gas exchange occurs.

ALVEOLUS & ALVEOLAR DUCTS

Alveoli in the respiratory bronchioles are scattered out-pockets extending from their lumens. The respiratory bronchioles, which run at considerable lengths, become increasingly alveolated with side branches of alveolar ducts that become deeply lined with alveoli. There are between two and eleven alveolar ducts on each bronchiole. Each duct opens into five or six alveolar sacs into which clusters of alveoli open.

At the end of the bronchioles, millions of tiny Alveoli air sacks take up 90% of the total lung volume. They contain collagen and elastic fibers, surrounded by a network of capillaries. Alveoli are where the exchange of oxygen and carbon dioxide takes place. Alveoli move oxygen and carbon dioxide (CO_2) molecules into and out of your bloodstream. They are the endpoint of the respiratory system. From there, oxygen molecules pass through the single-cell layer in a capillary to enter the blood system. There are three types of alveolar cells. Types 1 and 2 are in the alveolar wall. Type 3, large phagocytic cells (alveolar macrophage), move about in the lumen of the alveoli and the connective tissues between them. They continue to develop until age 3. But, the number and size of the alveoli increase until the development of the lungs finishes at approximately age 8. This is another example of why diet plays a big part in childhood development, starting with prenatal care.

Type 1 cells are involved in the gas exchange between the alveoli and blood. Their thin lining enables a fast diffusion of gas between the air in the alveoli and the blood in the surrounding capillaries. Its nucleus and organelle clusters occupy a large area. Its cytoplasm may play a role in removing small particulate contaminants from the outer surface. Type 1 cells are unable to replicate and are susceptible to toxic insults.

Type 2 cells are cuboidal and much smaller than type 1 cells. However, they are capable of cellular division and increase when type 1 cells are damaged. Hence, they are the most numerous in the alveoli. Type 2 cells secret a fatty-pulmonary surfactant made from phospholipids that reduce alveolar surface tension in the thin alveoli lining. Without this coating, the alveoli would collapse.

The alveolar macrophages and pulmonary macrophages or dust cells reside on the internal luminal surfaces of the alveoli, the alveoli, the alveoli ducts, and the bronchioles. They are mobile scavengers that engulf foreign particles in the lungs or blood cells from injuries.

CO_2 is a byproduct of the process in cells that uses oxygen to make energy. As oxygen moves out of the alveolus, CO_2 molecules pass into it. Then, they are exhaled through your nose or mouth. The surfactant fluid lining the alveoli maintains the shape of each air sac and helps to keep it open so oxygen and CO_2 can pass through.

Breath sounds heard during auscultation of the lungs can help diagnose lung disease.

Lung Diseases (Described by Wikipedia & WebMed)

- Asthma is hyperresponsiveness of the bronchi with an inflammatory component. Irritants in the air, photochemical smog, and substances that a person is allergic to can precipitate it. Constriction of the bronchi produces difficulty breathing or shortness of breath. This can lead to a lack of oxygen reaching the body for cellular processes. An inhaler can administer a bronchodilator that soothes the constricted bronchi and re-expands the airways. Herbal inhalers do not have the side effects that most medical inhalers do.
- Diffuse alveolar damage can cause acute respiratory distress syndrome (ARDS) a severe inflammatory disease of the lung.
- Chronic bronchitis is an abundance of mucus produced by the lungs. Mucus occurs when irritants enter lung tissue. In chronic bronchitis, the air passages into the alveoli and the respiratory bronchioles become clogged with mucus. This causes increased coughing to remove the mucus and is often a result of extended periods of exposure to cigarette smoke.
- Hypersensitivity pneumonitis.
- Cavitary pneumonia is a disease of destroyed alveoli that produce cavities. Damaged alveoli reduce the surface area for gas exchange. Further changes in blood flow can lead to a decline in lung function.
- Emphysema is another lung disease whereby the elastin in the walls of the alveoli breaks down by an imbalance between the production of neutrophil elastase (elevated by cigarette smoke) and alpha-1 antitrypsin (the activity varies due to genetics or reaction of a critical methionine residue with toxins including cigarette smoke). The resulting loss of elasticity in the lungs leads to prolonged times for exhalation, which occurs through passive recoil of the expanded lung. This leads to a smaller volume of gas exchanged per breath.
- Pulmonary alveolar microlithiasis is a rare lung disorder of small stone formation in the alveoli.
- Almost any type of lung tumor or lung cancer can compress the alveoli and reduce gas exchange capacity. In some cases, tumors fill the alveoli.
- A pulmonary contusion is a bruise of the lung tissue caused by trauma. Damaged capillaries can cause blood and other fluids to accumulate in the lung tissue, impairing gas exchange.
- Pulmonary edema is the buildup of fluid in the parenchyma and alveoli usually caused by left ventricular heart failure or damage to the lung or its vasculature.

The lower respiratory tract needs to be well nourished and free of toxins and pollutants for it to communicate and perform in unison the exchange of gases that benefit every other part of the body.