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**ANATOMY**

**ANA 202(GROSS ANATOMY OF THE THORAX AND ABDOMEN)**

**ANATOMICAL IMPLICATIONS OF COVID-19 ON THE HUMAN RESPIRATORY SYSTEM**

The virus, officially named SARS-CoV-2, enters the body – generally through the mouth or nose. When the virus enters your body, it comes into contact with the mucous membrane that lines your nose, mouth and eyes. Think of the human respiratory system as an upside down tree, leading from the nasal cavity through the trachea and terminating as air sacs called alveoli (site of gaseous exchange). Once in the alveoli, the virus uses its distinctive spike proteins to “hijack” cells. The primary genetic programming of any virus is to make copies of itself, and COVID-19 is no exception. Once the virus’ RNA has entered a cell, new copies are made and the cell is killed in the process, releasing new viruses to infect neighboring cells in the alveolus.

The process of hijacking cells to reproduce causes inflammation in the lungs, which triggers an immune response. As this process unfolds, fluid begins to accumulate in the alveoli, causing a dry cough and making breathing difficult.

The immune system’s response to inflammation in the lungs can cause what’s known as a [“cytokine storm”](https://www.npr.org/sections/health-shots/2020/04/07/828091467/why-some-covid-19-patients-crash-the-bodys-immune-system-might-be-to-blame). This runaway response can cause more damage to the body’s own cells than to the virus it’s trying to defeat, and is thought to be the main reason for why the conditions of young, otherwise healthy individuals can rapidly deteriorate. If enough alveoli collapse, a patient to be placed on a ventilator for breathing assistance. Both acute respiratory distress syndrome (ARDS) and high-altitude pulmonary edema (HAPE) are being investigated as causes. At this stage, the surfactant that helps keep alveoli from collapsing has been diluted, and fluid containing cellular debris is impairing the gas exchange process that supplies oxygen to our bloodstream.

In the most severe cases, systemic inflammatory response syndrome (SIRS) occurs as the protein-rich fluid from the lungs enters the bloodstream, resulting in septic shock and multi-organ failure. This is often the cause of death for people who have succumbed to a COVID-19 infection.

References:

*https://www.visualcapitalist.com/visualizing-what-covid-19-does-to-your-body*