**18/mhs07/001**

**Gross anatomy of thorax and abdomen**

**Pharmacology**

**Question: covid-19 is the ongoing viral pandemic in the world and the reason you are at home . discuss the anatomical implication of the vurus on the respiratoy system of human.**

**Answer:** For most patients, COVID-19 begins and ends in their lungs, because like the flu, coronaviruses are respiratory diseases.

They spread typically when an infected person coughs or sneezes, spraying droplets that can transmit the virus to anyone in close contact. Coronaviruses also cause flu-like symptoms: Patients might start out with a fever and cough that progresses to pneumonia or worse.

After the SARS outbreak, the World Health Organization reported that the disease typically attacked the lungs in three phases: viral replication, immune hyper-reactivity, and pulmonary destruction.

Not all patients went through all three phases—in fact only 25 percent of SARS patients suffered respiratory failure, the defining signature of severe cases. Likewise, COVID-19 causes milder symptoms in about 82 percent of cases, while the remainder are severe or critical.

In the early days of an infection, the novel coronavirus rapidly invades human lung cells. Those lung cells come in two classes: ones that make mucus and ones with hair-like batons called cilia.

Mucus, though gross when outside the body, helps protect lung tissue from pathogens and make sure your breathing organ doesn’t dry out. The cilia cells beat around the mucus, clearing out debris like pollen or viruses.

Frieman explains that SARS loved to infect and kill cilia cells, which then sloughed off and filled patients’ airways with debris and fluids, and he hypothesizes that the same is happening with the novel coronavirus. That’s because the earliest studies on covid 19 have shown that many patients develop pneumonia in both lungs, accompanied by symptoms like shortness of breath.

That’s when phase two and the immune system kicks in. Aroused by the presence of a viral invader, our bodies step up to fight the disease by flooding the lungs with immune cells to clear away the damage and repair the lung tissue.

When working properly, this inflammatory process is tightly regulated and confined only to infected areas. But sometimes your immune system goes haywire and those cells kill anything in their way, including your healthy tissue.

“So you get more damage instead of less from the immune response,” Frieman says. Even more debris clogs up the lungs, and pneumonia worsens.

During the third phase, lung damage continues to build—which can result in respiratory failure. Even if death doesn’t occur, some patients survive with permanent lung damage. According to the WHO, SARS punched holes in the lungs, giving them “a honeycomb-like appearance”—and these lesions are present in those afflicted by novel corona virus too.

These holes are likely created by the immune system’s hyperactive response, which creates scars that both protect and stiffen the lungs.

When that occurs, patients often have to be put on ventilators to assist their breathing. Meanwhile, inflammation also makes the membranes between the air sacs and blood vessels more permeable, which can fill the lungs with fluid and affect their ability to oxygenate blood.

“In severe cases, you basically flood your lungs and you can’t breathe,” Frieman says. “That’s how people are dying.”