NAME: EMMANUEL COLLINS DANIEL MAT **NO:** 18/MHS01/121
DEPARTMENT: ANATOMY

COURSE: HISTOLOGY OF THE SYSTEMS **COURSE CODE**: ANA 204

Q: Explain the histological basic of upper respiratory system (Conducting Portion of the respiratory system) attacked by Corona Virus.

Corona viruses are RNA viruses that affect the respiratory tract, some human corona viruses include SARS, MERS and Covid-19 (SARS-COV2 Severe Acute Respiratory Syndrome Corona Virus 2).they are zoonotic. Covid-19 is like most respiratory viruses affecting the movement of air into and out of the lungs. It is spread though the droplets from an infected person. Those most at risk to severe complications are the old (70 and above) and have a weak immune response. This enters into the epithelia lining of the nose eye or mouth, it takes 2-14 days to develop symptoms.,

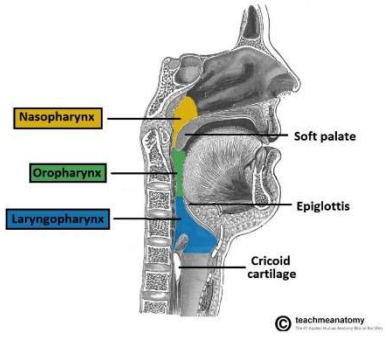
Older people and people with other medical conditions (such as asthma, diabetes or heart disease) may be more vulnerable to becoming severly ill.

UPPER RESPIRATORY TRACT (CONDUCTING PORTION)

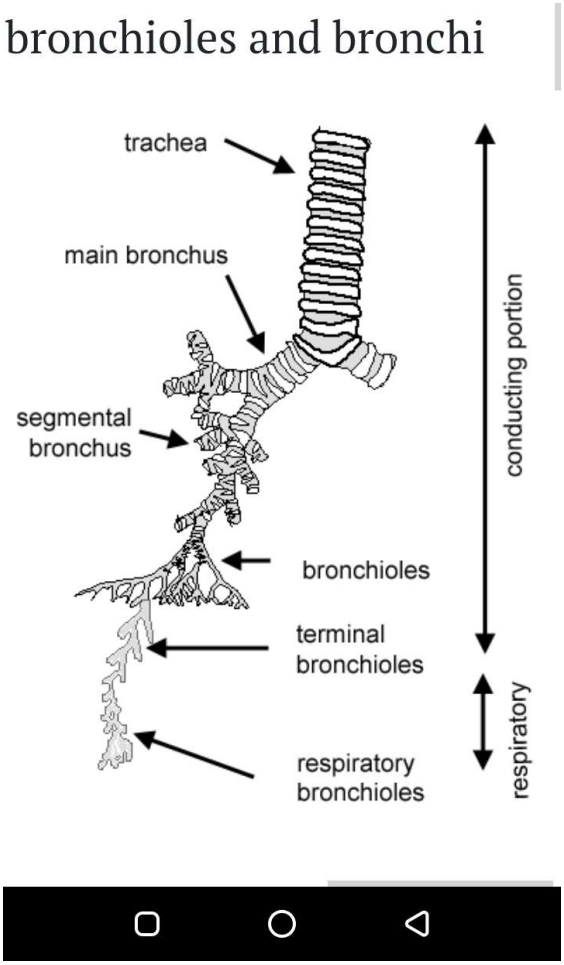
It first takes place in the upper respiratory tract. This consists of all the components that condition air and bring it into the lungs (nasal cavities, frontal sinus, sphenoidal sinus, nasopharynx, larynx, trachea, bronchi, bronchioles and terminal bronchioles). Symptoms may include-Dry cough, shortness of breath, headache, fatigue, fever, runny nose.

Once it gets inside the body it infects the epithelial cells which are respiratory epithelium (ciliated pseudostratified columnar epithelium) and contains a rich population of ciliated columnar cells, goblet cells, brush cells, small granule cells, basal cells. A protein (spiked) on the receptor of the virus can attach to the host cells receptors (angiotensin converting enzyme 2) and penetrates the cell, thereby releasing its RNA into the cells forcing replication until it kills the cell.

It is noticed that there is increased death in the number ciliated cells, dyskinetically beating of the cilia, delayed nasal mucus clearance



Nasal fossae- upon nasal infection. It is noticed that there is increased cell death (apoptosis) of both respiratory and olfactory epitheliums. Death of the Olfactory epithelium which contains the basal, supporting and olfactory cells leads to loss of smell symptom reported in few patients.



Nasopharynx- It is lined by respiratory epithelium, whereas the oropharynx and laryngopharynx containing stratified squamous epithelium. The virus causes a damage to the mucosa and epithelium which leads to a variety of symptoms that has to do with swelling and inflammation of the back of throat such as sore throat/pharyngitis (which leads to difficulty in swallowing). There may also be inflammation of lymph nodes as a result of immune response by lymphocytes. The adenoid tonsils can become pathologically enlarged due to viral infections of the upper respiratory tract. In the case of recurrent infections, they can become chronically enlarged. When enlarged, the adenoids can obstruct the opening of the Eustachian tube – which is located close to the adenoid tonsils in the nasopharynx.

Trachea- The ciliated columnar cells which sweep mucous up to the oropharynx which protects the lungs from damage depletes. There is also death of goblet cells that makes mucous which will lead to particles going down to the lungs thereby causing lung damage, and results to dry cough as the debris increases. The serous glands decrease leading to a lack of response in the presence of the next symptom which is dry cough. T lymphocyte, and cytokine, particularly monocyte and neutrophil response to the viral attack will result in certain symptoms such as increased temperature/fever which may lead to headaches this will continue until the patient recovers.

Bronchi- it becomes inflamed and irritated giving rise to bronchitis, the cough in this scenario is usually dry which may progress into acute bronchitis. This is due to the death of the columnar epithelium and few goblet cells. Progenitor cells in the bronchi are responsible for producing the corona virus receptor cells, as the virus hijacks the cell.

Bronchioles- it is lined by simple cuboidal epithelium, ciliated in larger and non-ciliated in smaller, which die as the virus progresses downward toward the lower respiratory tract. Clara cells may also be damaged.

Terminal Bronchioles-the cells destroyed are the simple cuboidal epithelium containing club cells.