**Human Biology Task 3**

**2 Lung Diseases Research**

**Cystic Fibrosis**

Cystic fibrosis is a hereditary condition that affects the mucus in the organs. CF is caused by the changes or mutations of a gene in the body called the cystic fibrosis transmembrane conductance regulator. Mucus in your organs aids the function of the organs and systems; it is thin and slippery whereas mucus produced by CF is thick and sticky, clogging passages all over the body.

**Causes**

Cystic fibrosis is caused by a change or mutation in the cystic fibrosis transmembrane conductance regular. The CFTR regulates the flow of salt and fluids in and out of the body. When the CFTR gene doesn’t work as it should, it produces a sticky and thick mucus which builds up in the body. People diagnosed with cystic fibrosis must inherit it from both their parents who carried the mutated copy of the gene. The most common cystic fibrosis mutations is the F508del, this is caused when a single amino acid is removed from the CFTR protein. Individuals must have both parents with the mutated CFTR gene to inherit the CF, if only one parents owns the transfigured gene you will become a carrier of cystic fibrosis carrier

**Symptoms and Diagnosis**

Common symptoms amongst Cystic Fibrosis patients are:

* Salty sweat
* Poor weight gain and growth
* Constant coughing
* Wheezing
* Thick mucus
* Greasy and smelly stools which are bland coloured and large

Doctors will conduct DNA, Blood or Sweat tests to see if they have CF. The DNA test can tell if the person is a carrier of the mutated CFTR. Blood tests are used to see if patients have higher levels of immunoreactive trypsinogen. Sweat tests are used to measure the salt in sweat, people with CF loose large amount of sodium through their sweat

**Treatments**

There are many ways to treat cystic fibrosis, the treatments won’t remove or prevent it, but ease symptoms. Cystic Fibrosis can be treated with medication, airways clearance techniques and psychical therapy.

Medication commonly used:

* Would be antibiotics to treat or prevent lung infections
* Anti- inflammatory medicines
* Bronchodilators which relax and open airways
* Mucus thinners which will help get the gunk out of the way
* Combination therapy which combines the three types of CFTR modulators to target the CFTR protein to work in better than before.

Airways clearance techniques include:

* Chest therapy which involves clapping on the chest to clear mucus away from the lungs
* Using an oscillating device which vibrates the airways causing the mucus to loosen up making it easier to cough out.

Physical therapy methods:

* Fibrosis autogenic drainage is the process of breathing out hard, causing the mucus to move away from smaller airways and into the central airways making it easier to cough up.
* Active cycle of breathing is when they control their breathing and relax their upper chest this should help clear the mucus and prevent airway blockages.

**Prevention**

There are no prevention methods that can be used to prevent or cure cystic fibrosis but future methods may involve gene therapy which must be done at an early age, this therapy can either repair or replace the mutated gene.

**Pneumonia**

Pneumonia is an infection which inflames the tiny sacs in the lungs with fluids. It can either be caused by infectious pathogens such as viruses, fungi and bacteria when they get into your lungs. These pathogens can come from coughs, sneezes and contaminated surfaces. It is extremely dangerous when diagnosed in children, elderly people and people who have a weak immune system.

Usually, the body can fight off these pathogens but when the germs are too strong the body can’t do its part properly causing the lungs to get infected. The immune system sends cells which are to attack germs, this causes inflammation in the lungs.

**Causes**

Bacteria, Fungi and Viruses are the main causes of pneumonia. Bacterial Pneumonia usually occurs after the cold or flu because your immune system is still fragile, as once the bacteria travel into the lungs they multiply. Individuals who get fungal pneumonia are exposed to great amounts of fungi such as contaminated soil or bird stools. When viruses infect the upper respiratory area, this causes viral pneumonia

**Symptoms**

Symptoms of pneumonia are similar to the cold or the flu such as:

* chills
* high fever
* deep cough which may bring up think substances called phlegm.

This can also cause shortness of breath and chest pain whenever you breath. It will last much longer than the cold or the flu. If people can still do regular activities and don’t feel extremely tired and fatigue, they will have a case of walking pneumonia which is not has bad.

**Diagnosis**

To get diagnosed with pneumonia x-ray screening of the lungs must be done. The image will be able to tell them if they have pneumonia, but it will not be able to tell what is causing the infection, the pathogens could either be bacteria, virus or fungi. The phlegm that comes out after coughing can be tested for bacteria. If a virus is causing the inflammation a professionals listens to the lungs using a stethoscope to hear if there is fluid in the lungs. Fungal Pneumonia requires a blood test to see how the body is immune system is and how it behaves towards the fungus. Doctors may also ask if they have been around sick people, animals, their recent travels, hobbies and drugs or vaccines you you’ve recently had done.

**Treatments**

Treatment varies depending on what’s causing the individuals pneumonia. If patients suffer from bacterial pneumonia doctors will use antibiotics to kill the bacteria and it’ll improve their symptoms. Viral pneumonia doesn’t have a treatment as the body can fight it off in 1 to 3 weeks whereas Fungal pneumonia can be cured with antifungal drugs which kills or stops the growth of the fungi in the lungs.

**Preventions**

Some prevention methods include:

* Get vaccinations regularly
* Keep hands and face clean
* Eat healthy and exercise regularly
* Don’t smoke

Get vaccines on a regular basis to avoid contracting pneumonia. Keep hands and face clean. To maintain a healthy immune system, eat well and exercise regularly. It is advised that people refrain from smoking as it makes it difficult for your lungs to fight germs.