

***Human Biology ATAR – Task 3: Extended Response***

***Lung diseases and treatments (7.5%)***

|  |  |  |  |
| --- | --- | --- | --- |
| Name: Taleah Ambler | | | |
| Time allowed: 1 Lessons | | | |
| **Section** | Your Mark | Marks available | Percentage |
| **Section 1:**  Report |  | 10 | 18.5% |
| **Section 2**:  Validation Test |  | 44 | 81.5% |
|  |  | **54** | **100%** |

**Declaration of Authenticity**

I (Student Name) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ declare that this work is my own and I have not plagiarised from any source.

Signature:  
  
Date:

**Lung disease and treatments**

You are to choose **one** lung disease from List A and **one** disease from List B to research and find information about the named aspects of each disease. You will then complete an in-class validation assessment on your research without notes.

DISEASES

|  |  |
| --- | --- |
| **LIST A** | **LIST B** |
| Chronic bronchitis | Pneumonia |
| Emphysema | Pleurisy |
| Cystic fibrosis | Tuberculosis |

Check list

* Cause, or main causes
* Symptoms and diagnosis
* Current treatments…how they work and what they do
* Prevention

Write the names of the diseases you have chosen here:

Disease A\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Disease B\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Marks Table**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Report** | **Cause** | **Symptoms** | **Treatments** | **Prevention** | **Marks** | Your mark |
| **Disease A** | 1 | 1 | 1 | 1 | 5 |  |
| **Disease B** | 1 | 1 | 1 | 1 | 5 |  |

This sheet is to be the cover page of your report

Cystic fibrosis

* Cause, or main causes

a faulty gene that a child inherits from both of their parents. The faulty gene means that some cells struggle to move salt and water across the cell wall. This, along with recurrent infections,

<https://www.nhsinform.scot/illnesses-and-conditions/lungs-and-airways/cystic-fibrosis> - (NHS 24, February 2023)

* Symptoms and diagnosis
* recurring [chest infections](https://www.nhsinform.scot/illnesses-and-conditions/infections-and-poisoning/chest-infection)
* frequent, wet-sounding [coughs](https://www.nhsinform.scot/illnesses-and-conditions/lungs-and-airways/cough)
* [diarrhoea](https://www.nhsinform.scot/illnesses-and-conditions/stomach-liver-and-gastrointestinal-tract/diarrhoea/)
* occasional wheezing and [shortness of breath](https://www.nhsinform.scot/illnesses-and-conditions/lungs-and-airways/shortness-of-breath)

People with the condition can also develop a number of related conditions, including [diabetes](https://www.nhsinform.scot/illnesses-and-conditions/diabetes/diabetes), thin, weakened bones ([osteoporosis](https://www.nhsinform.scot/illnesses-and-conditions/muscle-bone-and-joints/conditions/osteoporosis/)) and liver problems.

* a sweat test – to measure the amount of salt in sweat, as the sweat of someone with cystic fibrosis has higher levels of salt than normal
* a genetic test – where a sample of blood or saliva is checked for the faulty gene that causes cystic fibrosis

<https://www.nhsinform.scot/illnesses-and-conditions/lungs-and-airways/cystic-fibrosis> - (NHS 24, February 2023)

Current treatments…how they work and what they do

[antibiotics](https://www.nhsinform.scot/tests-and-treatments/medicines-and-medical-aids/types-of-medicine/antibiotics) to prevent and treat [chest infections](https://www.nhsinform.scot/illnesses-and-conditions/infections-and-poisoning/chest-infection/)

medicines to make the mucus in the lungs thinner and easier to cough up

medicines to widen the airways and reduce inflammation

special techniques and devices to help clear mucus from the lungs

medicines that help the person absorb food better

following a special diet and taking supplements to prevent [malnutrition](https://www.nhsinform.scot/illnesses-and-conditions/nutritional/malnutrition)

A [lung transplant](https://www.nhsinform.scot/tests-and-treatments/surgical-procedures/lung-transplant)

<https://www.nhsinform.scot/illnesses-and-conditions/lungs-and-airways/cystic-fibrosis> - (NHS 24, February 2023)

* Prevention

At this time, preventing CF is not possible. In babies with two abnormal CF genes, the disease is already present at birth in some organs, such as the pancreas and liver, but develops only after birth in the lungs.

<https://www.cdc.gov/scienceambassador/documents/cystic-fibrosis-fact-sheet.pdf> (U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, N/D)

Others can wash their hands regularly with alcohol-based hand sanitizer or antimicrobial soap and water. Patients with CF should wear a mask while in the clinic areas, and parents should make sure their children avoid touching or playing with any toys in the waiting areas.

<https://www.hopkinsallchildrens.org/Services/Pulmonology/Pediatric-Cystic-Fibrosis/Infection-Prevention-and-Control> – (Johns Hopkins All Children's Hospital, 2023)

Tuberculosis

* Cause, or main causes

type of bacterium called Mycobacterium tuberculosis

not as contagious than a [cold](https://www.nhs.uk/conditions/common-cold/) or [flu](https://www.nhs.uk/conditions/flu/),

* spend prolonged periods (several hours) in close contact with an infected person to catch the infection yourself.

Not everyone with TB is infectious.

Children with TB or people with a TB infection that occurs outside the lungs [(extrapulmonary TB)](https://www.nhs.uk/conditions/tuberculosis-tb/symptoms/#extrapulmonary-tb) do not spread the infection.

<https://www.nhs.uk/conditions/tuberculosis-tb/causes/> - (NHS ,November 2019)

* Symptoms and diagnosis

feelings of sickness or weakness, weight loss, fever, and night sweats. disease of the lungs also include coughing, chest pain, and the coughing up of blood disease in other parts (brain, the kidneys, or the spine)of the body abdominal pain, pain and loss of movement in an affected bone or joint, confusion, a persistent headache, seizures, persistently swollen glands.

<https://www.nhs.uk/conditions/tuberculosis-tb/causes/> - (NHS ,November 2019)

in Australia, TB in the lungs: A chest x-ray can show whether TB disease has affected the lungs.

A sputum test shows if TB germs are present in coughed up sputum.

a fine needle biopsy, wound swab, surgical specimen, or early morning urine sample can assist in diagnosing TB.

<https://www.health.nsw.gov.au/Infectious/factsheets/Pages/tuberculosis.aspx> –(NSW Health, March 2022)

* Current treatments…how they work and what they do

isoniazid INH in combination with three other drugs—rifampin, pyrazinamide and ethambutol.

<https://www.lung.org/lung-health-diseases/lung-disease-lookup/tuberculosis/treating-and-managing> – (American Lung Association Scientific and Medical Editorial, November 2022)

isoniazid INZ is a an antibiotic treatment of mycobacterium tuberculosis infections

<https://www.ncbi.nlm.nih.gov/books/NBK557617/> (Courtney O'Connor; Mark F. Brady, April 8, 2022)

Rifampin is an ansamycin antibiotic used to treat several types of bacterial infections, a capsule to take by mouth. works best on an empty stomach

<https://medlineplus.gov/druginfo/meds/a682403.html> (ASHP, April 2019)

Pyrazinamide kills or stops the growth of certain bacteria, a tablet to take by mouth Pyrazinamide may be taken with or without food.

<https://medlineplus.gov/druginfo/meds/a682402.html> (ASHP, July 2017)

ethambutol stops the growth of bacteria. This antibiotic treats only bacterial infections. It will not work for viral infections Take this [medication](http://www.webmd.com/drugs/index-drugs.aspx) by [mouth](http://www.webmd.com/oral-health/anatomy-of-the-mouth) with or without food,

<https://www.webmd.com/drugs/2/drug-8082/ethambutol-oral/details> (WedMD, N/D)

* Prevention

Avoid close contact of a person with active TB

Get vaccinated.

Avoid close contact with a group of higher chance of TB transmission like the homeless, injection drug users, HIV infections or AIDS.

Maintain well-balances diet to keep immune system strong.

## <https://www.facebook.com/ipacfoundation/photos/24-march-world-tuberculosis-dayhow-do-we-prevent-from-tuberculosisprimary-preven/198398861614874/> - ([Infection Prevention And Control Foundation](https://www.facebook.com/ipacfoundation/?__tn__=-UC*F), March 2020)

Cystic fibrosis

* Cause

Cystic fibrosis is cause by a faulty gene inhabited by cell mutation inherited by both parents of the child.

This gene means to cause cell struggle in moving salt and water across the cell membrane building up thick mucus and clog up the digestive system and the lungs.

The mutation is in every organ that produces mucus, including lungs, liver, pancreases, intestines and sweat glands.

(NHS 24, February 2023)

* + - Symptoms
    - Recurring chest infections
    - Cough (wet sounding)
    - Diarrhoea
    - Wheezing and shortness of breath (occasional)

(NHS 24, February 2023)

* Diagnosis

people with the condition can also develop related conditions:

* + - * diabetes
      * thin (malnourishment)
      * osteoporosis (weak bones)
      * liver problems

(NHS 24, February 2023)

* Sweat testing.
* measure the amount of salt water in the sweat of someone that maybe could possess cystic fibrosis, because someone with cystic fibrosis has higher levels of salt than normal.

(NHS 24, February 2023)

* Genetic testing
* a sample of blood or saliva is checked for the faulty gene of the biological parent that causes cystic fibrosis.

(NHS 24, February 2023)

* Treatment
  + - Antibiotics – help prevent and treat chest infections.
    - Medicines (dornase alfa, hypertonic saline, and mannitol dry powder) to make the mucus in the lungs easier to cough up(phlegm).
    - Medicines (prednisone)to widen the airways and reduce inflammation.
    - Special devices (High-Frequency Chest Wall Oscillation – the vest) to help clear mucus from the lungs.
    - Medicines (Trikafta, Kalydeco, Orkambi, Symdeko) that help the person absorb food better.
    - Supplements (water-soluble vitamins - vitamin C and the B-complex vitamins, folic acid, biotin, and pantothenic acid) and a special diet – prevent malnutrition.
    - In some serious cases, a lung transplant.

(NHS 24, February 2023)

* Prevention

At this point there is no cure for Cystic Fibrosis.

Babies with 2 Cystic Fibrosis genes, the disease is already set at birth in some of the newborn’s organs (pancreases and liver), though Cystic Fibrosis only develops in the lungs after birth.

(U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, N/D)

Though nothing can be done for the baby possessing 2 Cystic fibrosis genes, others can:

* Wash their hands regularly (alcohol base sanitizer or antimicrobial soap and water)
* Both the patient and guardians should wear a mask in the clinic.
* Parents or guardians should avoid the child with Cystic fibrosis touching or playing with any toys in the waiting area of the clinic.

(Johns Hopkins All Children's Hospital, 2023)

Tuberculosis

* + Cause

Tuberculosis is caused by a type of bacterium called ‘Mycobacterium’.

Though tuberculosis is contagious, it’s not as bad as a common cold or the flu, however spending several hours in close contact in with an infected person to catch Tuberculosis yourself – like many spreadable illnesses.

Not everyone with Tuberculosis is infectious.

* Patients with Tuberculosis infection that occurs outside the lungs do not spread the infection.

(NHS, November 2019)

* + Symptoms
* Feelings of sickness or weakness
* Weight loss
* Fever
* Night sweats
* Chest pain
* Coughing blood
* Persistent headache
* Seizures
* Persistently swollen glands

(NHS, November 2019)

* + - Diagnosis

Tuberculosis can infect other parts outside the lungs.

* Brain
* Kidney
* Spine

(NHS, November 2019)

Tuberculosis in the lungs:

* Chest X-Rays
* Show whether Tuberculosis has affected the lungs.
* Sputum test
* Shows if Tuberculosis germs are present in coughed up sputum.

Tuberculosis outside the lungs:

* Fine needle biopsy
* Wound swab
* Surgical Specimen
* Urine Sample

(NSW Health, March 2022)

* + - Treatment

Isoniazid INH, combined with 3 other drugs – Rifampin, Pyrazinamide, Ethambutol.

* Isoniazid is an antibiotic to specifically treat Tuberculosis.

(Courtney O'Connor; Mark F. Brady, April 8, 2022)

* Rifampin – An Ansamycin antibiotic used to treat bacterial infections – (capsule) taken by mouth, works best on an empty stomach.

(ASHP, April 2019)

* Pyrazinamide – kills and stops the growth of certain bacteria – (tablet) taken by mouth, may be taken with or without food.

(ASHP, July 2017)

* Ethambutol – stops growth of bacterial infections – (tablet) taken by mouth, may be taken with or without food.

(WedMD, N/D)

* + - Prevention

Avoid close contact of an active Tuberculosis infected person.

Get Vaccinated

Avoid groups with higher chance of Tuberculosis infected people.

Eg. Homeless, Drug users(injection), HIV infections and AIDS.

Maintain a well-balanced diet – increase the strength of your immune system.

([Infection Prevention and Control Foundation](https://www.facebook.com/ipacfoundation/?__tn__=-UC*F), March 2020)

References:

Cystic Fibrosis

<https://www.nhsinform.scot/illnesses-and-conditions/lungs-and-airways/cystic-fibrosis> (NHS 24, February 2023)

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<https://www.nhs.uk/conditions/tuberculosis-tb/causes/> (NHS ,November 2019)

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<https://www.webmd.com/drugs/2/drug-8082/ethambutol-oral/details> (WedMD, N/D)

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