B5: Health, Disease & the Development of Medicines

1. Health and Disease

Health	A state of complete physical, social and mental wellbeing.
Physical Health	Being free from disease, active, fit, sleeping well and no substance abuse.
Mental Health	How you feel about yourself.
Social Health	Having healthy relationships and how your surroundings affect you.
Disease	An illness that prevents the body from functioning normally.
Communicable Disease	Diseases caused by pathogens, can be spread from one person to another.
Non-Communicable Disease	Diseases caused by genes or lifestyle. Cannot be spread from one person to another.
Correlated Diseases	Getting one disease increases your chance of another due to diseases weakening organ systems, damaged immune system, and weaker defences.
Pathogen	A microorganisms that causes disease.

2. Non-Communicable Diseases

Genetic Disorders	Diseases caused by inheriting faulty genes from parents.
Malnutrition	Getting too little or too much of a particular nutrient.
Deficiency Disease	Disease caused by the lack of a certain nutrient.
Drug	Chemical that changes the way the body works.

3. Cardiovascular Disease

Obesity	A condition in which someone is overweight for their height and large amounts of fat builds up around major organs.
Cardiovascular Disease	Disease in which the heart or circulatory system is affected.
Heart Attack	When the heart stops pumping due to a lack of oxygen reaching it.
BMI	Body mass Index $\text{BMI} = \frac{(\text{weight in kilograms})}{\text{height in meters}^2}$ BMI over 30 is obese
Waist:hip Ratio	Waist measurement ÷ hip measurement Better method of measuring abdominal fat which is linked with cardiovascular disease.
Stent	A small mesh tube that is inserted into a narrowed artery and opened up to widen it.
Treating Heart Disease with Lifestyle	More exercise and a better diet can treat cardiovascular disease and giving up smoking.

4. Pathogens

Types of Pathogen	Bacteria, virus, protist, fungi.
Tuberculosis	Bacteria. Damages lungs causing bloody cough, fever and weight loss.
Cholera	Bacteria. Sever life-threatening diarrhoea.
Chalara Ash Dieback	Fungi. Kills the leaves of ash trees, killing the tree.
Malaria	Protist. Multiplies inside red blood cells and liver cells and causes fever and weakness.
Haemorrhagic Fever	Virus, e.g. Ebola. Liver and kidney damage, internal bleeding and fever.
HIV	Human immunodeficiency virus attacks white blood cells, causing AIDS.
AIDS	Acquired Immunodeficiency Syndrome. Weakened immune system making simple infections deadly. Caused by HIV.

5. Spreading Pathogens

Airborne	Spread through the air. Colds/flus/TB by infected droplets in saliva being passed into the air by coughing or sneezing. Chalara ash dieback by fungal spores carried by wind.
Waterborne	Spread through contaminated water. Cholera
Oral Route	Pathogen enters body through the mouth by eating/drinking.
Vectors	Organisms that carry a pathogen from one person to the next. Mosquitos are vectors for malaria.
Bodily Fluids	Spreading through contact with bodily fluids such as blood or semen. HIV
Hygiene	Keeping things clean to remove or kill pathogens.
Epidemic	When many people over a large area are infected with the same pathogen at the same time.

6. Physical & Chemical Barriers

Chemical Defences	Kill pathogens or make them inactive before they can infect us.
Lysozyme	Enzyme found in mucus, tears and sweat that kills some bacteria.
Hydrochloric Acid	Found in the stomach, reducing pH to 2, killing most pathogens.
Physical Barrier	Block or trap pathogens so they cannot enter the body.
Mucus	Sticky secretion that traps pathogens- found in most body openings (nose, mouth, etc.).
Ciliated Cells	Specialised cells with hair like cells that sweep mucus out of the body.
Skin	Blocks pathogens from entering the body.
STIs	Sexually transmitted infections – pathogens spread via sexual activity.

7. The Immune System

Immune System	Destroys pathogens that manage to infect us.
Antigens	Chemical markers on the surface of pathogens that identify them as a pathogen. Unique to each pathogen.
Lymphocyte	White blood cells that produce antibodies. Each lymphocyte produces a different antibody.
Antibodies	Molecules with a specific shape that can attach to a specific antigen on a pathogen and kill it.
Immune	The body has memory lymphocytes to fight the pathogen if it returns so it can't be harmed by it.
Vaccine	A weakened or inactive version of a pathogen.

8. Antibiotics

Antibiotics	Substances that kill bacteria or inhibit their processes without harming human cells.
Penicillin	The first antibiotic discovered by Alexander Fleming. Produced by a mould.
Resistance	Widespread use of antibiotics has led to resistance, meaning many antibiotics don't work as well as they once did.
Discovery Phase	Developing new chemicals that might work as medicines.
Pre-Clinical Phase	Testing on cells grown in the lab, or on animals, to see if the chemical has any useful effect.
Small Clinical Trial	Testing on a few healthy people to check for safety.
Large Clinical Trial	Testing on many patients to discover how effective the drug is and determine the dose.
Side Effects	Unwanted effects of the medication that can be quite harmful.
Dose	The correct amount of the medicine that needs to be given to the patient.