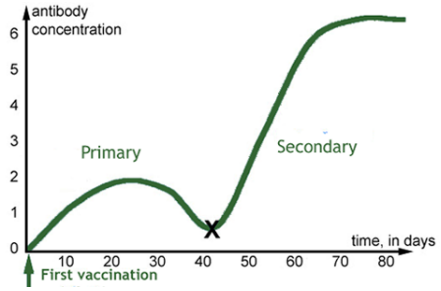
B3 – Infection and Response

Communicable Diseases – diseases caused by a pathogen

Disease	Pathogen	Symptoms	Spread by	Prevent spread	Treatment
Salmonella	Bacteria	Fever, cramps, vomiting, diarrhoea	Contaminated food	Vaccinating poultry, cooking food thoroughly	Antibiotics or management of symptoms
Gonorrhoea	Bacteria	Yellow/green discharge, pain when urinating	Sexual Contact	Using barrier protection, e.g. condoms	Antibiotics
Measles	Virus	Red rash and fever	Breathing in droplets from coughs/sneezes	Vaccination	No cure – only management of symptoms
HIV	Virus	Flu-like symptoms, develops into AIDS	Sexual contact	Using barrier protection, e.g. condoms	Antiretroviral drugs
Tobacco Mosaic Virus (plants)	Virus	'Mosaic' pattern of discolouration on the leaves	Soil	Destroy infected plants	No treatment
Rose Black Spot (plants)	Fungus	Black spots on leaves	Wind or water	Remove and destroy infected leaves	Fungicides
Malaria	Protist	Recurrent episodes of fever	Insect bites (mosquitoes)	Mosquito nets, insect repellent	Antimalarial drugs

Vaccination

- Introducing small quantities of dead or inactive forms of pathogen into the body.
- Stimulates WBCs to produce antibodies.



- If same pathogen returns (X), memory cells remember how to make the right antibodies.
- They make MORE antibodies, MORE QUICKLY, and they stay in body for LONGER.

Antibiotics & Painkillers

Antibiotics = kill bacteria (specific antibiotic for specific bacteria) **THEY DO NOT KILL VIRUSES** e.g. penicillin

Antibiotics cannot kill viruses because viruses live inside cells

Painkillers = stop pain (don't kill microbes, just help with symptoms) e.g. paracetamol

Development of Drugs

Testing for:

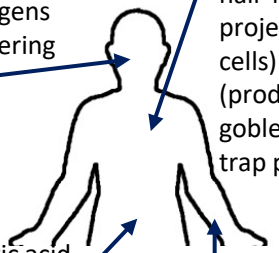
- Safety
- Efficacy (does it work)
- Dosage (how much is needed)

Stage		Description
1	pre-clinical	Tested on cells and tissues. Toxic? Side effects?
2	pre-clinical	Tested on animals. Side effects?
3	clinical	Clinical trials = tested on humans. 1st healthy volunteers, 2nd patients with the illness. Dosage gradually increased to optimum.

Non-specific Defence Systems

Nose
Hairs and mucus trap pathogens before entering lungs.

Trachea & Bronchi
Cilia cells (small hair-like projections from cells) and mucus (produced by goblet cells) trap pathogens.

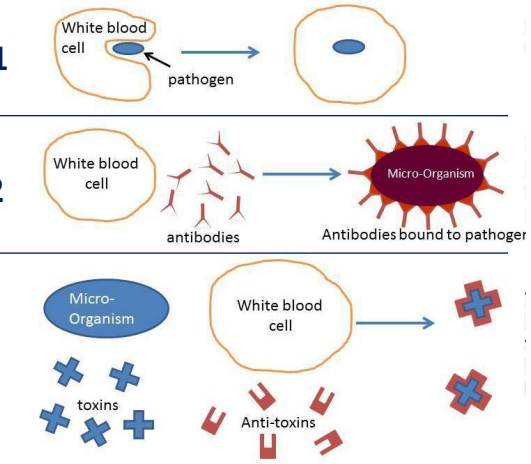


Stomach
Contains hydrochloric acid to kill pathogens that have been eaten.

Skin
If damaged, repairs itself (scabs)

White Blood Cells (WBCs)

1. Phagocytosis – engulfing the pathogen
2. Producing antibodies – specific to the antigen
3. Producing antitoxins – to neutralise toxins



B3 – Infection and Response

1. What is a communicable disease?
2. What are the symptoms of gonorrhoea?
3. Which type of pathogen causes rose black spot?
4. How is measles spread?
5. How can we prevent the spread of malaria?
6. What type of microbe causes salmonella?
7. How is salmonella spread?
8. How can HIV be treated?

1. What is the only type of pathogen antibiotics can kill?
2. What do painkillers do?
3. Why can antibiotics NOT kill viruses?

1. What are clinical trials?
2. What are the three things we test for before a drug can be used by the public?
3. What is the first stage of drug testing?
4. What are drugs tested on in preclinical trials?

1. What is in a vaccination?
2. Why do the white blood cells respond more quickly the second time they come into contact with a pathogen?
3. How does vaccination prevent us from becoming infected with the same pathogen in the future?

1. How are the trachea and bronchi adapted to help prevent infection?
2. What does the stomach contain to prevent infections?

1. What is phagocytosis?
2. What do antibodies attach to?
3. How to antitoxins make us feel better?

B3 – Infection and Response

1. What is a communicable disease? One that can be passed on because it is caused by a pathogen
2. What are the symptoms of gonorrhoea? Yellow discharge from genitals and pain when urinating
3. Which type of pathogen causes rose black spot? fungus
4. How is measles spread? Inhaling droplets that an infected person has breathed out
5. How can we prevent the spread of malaria? Reduce the number of mosquitoes or prevent them biting
6. What type of microbe causes salmonella? Bacteria
7. How is salmonella spread? Improperly cooked food, especially chicken
8. How can HIV be treated? Using antiretroviral drugs

1. What is the only type of pathogen antibiotics can kill? bacteria
2. What do painkillers do? Relieve the symptoms of an illness
3. Why can antibiotics NOT kill viruses? Because viruses live inside our cells

1. What are clinical trials? Trials of new drugs to see if they are safe and effective in humans
2. What are the three things we test for before a drug can be used by the public? Toxicity/ side effects, does it work (efficacy) and what dose is needed
3. What is the first stage of drug testing? Testing on cells
4. What are drugs tested on in preclinical trials? animals

1. What is in a vaccination? A weakened form of the bacteria or virus that causes the disease
2. Why do the white blood cells respond more quickly the second time they come into contact with a pathogen? The memory cells already know how to make the right antibodies so they can make them much faster
3. How does vaccination prevent us from becoming infected with the same pathogen in the future? The white blood cells make antibodies and the memory cells remember how to make these if the real pathogen gets into the body

1. How are the trachea and bronchi adapted to help prevent infection? They have cilia (tiny hairs) and mucus, which cause bacteria etc to stick to it and be moved up towards the mouth
2. What does the stomach contain to prevent infections? acid

1. What is phagocytosis? Where white blood cells ingest pathogens and digest them using enzymes
2. What do antibodies attach to? antigens
3. How to antitoxins make us feel better? They bind with toxins and nuetralise them