



Most Trusted Learning Platform



Cancer:

Cancer is a disease in which some of the body's cells grow uncontrollably and spread to other parts of the body.

Cancer can start almost anywhere in the human body, which is made up of trillions of cells.

Normally, human cells grow and multiply (through a process called cell division) to form new cells as the body needs them.

When cells grow old or become damaged, they die, and new cells take their place.

Sometimes this orderly process breaks down, and abnormal or damaged cells grow and multiply when they shouldn't.

These cells may form tumors, which are lumps of tissue.

Cancer

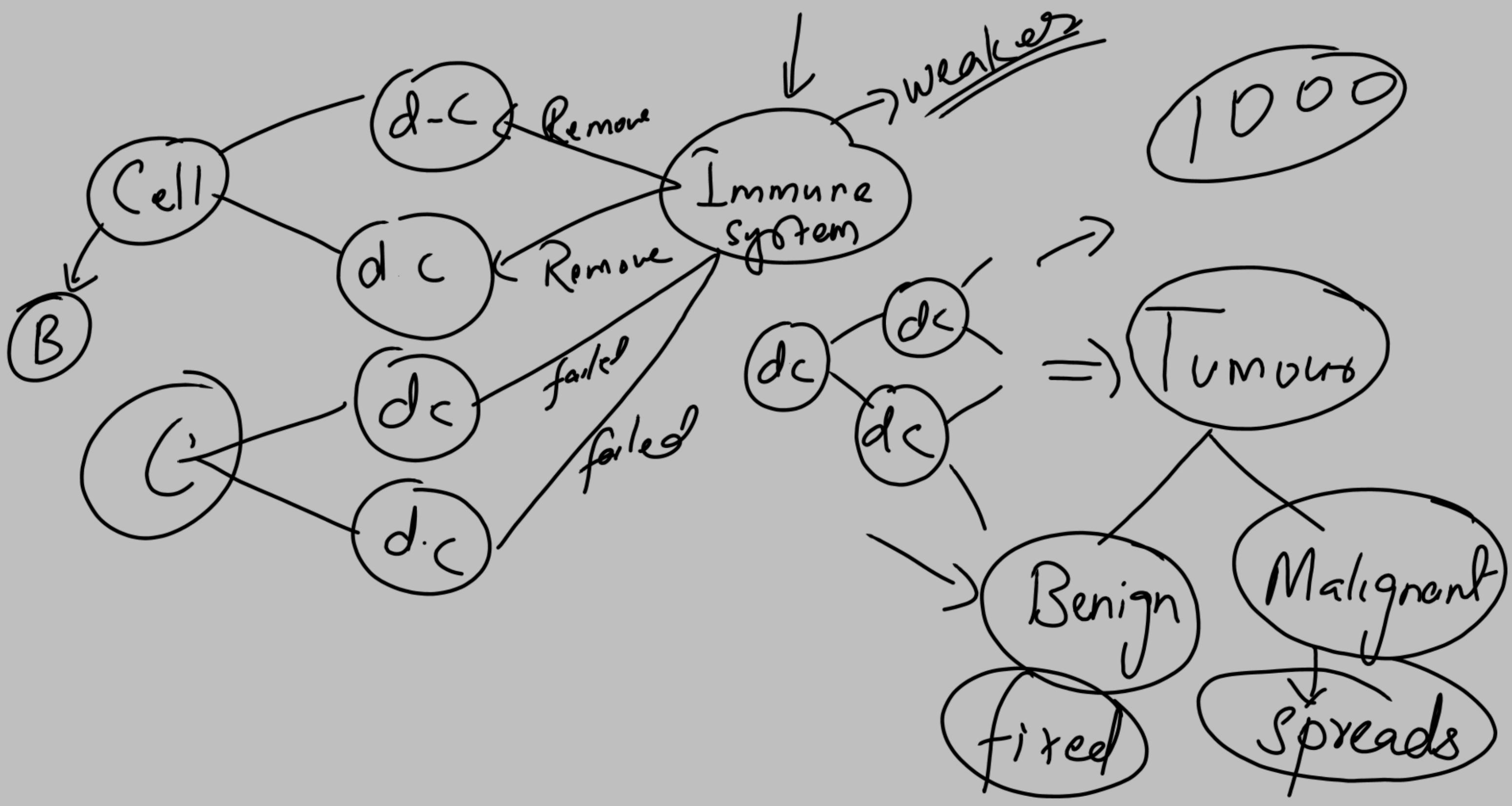
Body

↳ Cells

↳ divides
continuously

↳ Control of
Brain

↳ may have
some defect (once in million)



Cancer:

Tumors can be cancerous or not cancerous (benign).

Cancerous tumors spread into, or invade, nearby tissues and can travel to distant places in the body to form new tumors (a process called metastasis).

Cancerous tumors may also be called malignant tumors.

Many cancers form solid tumors, but cancers of the blood, such as leukemias, generally do not.

Benign tumors do not spread into, or invade, nearby tissues.

When removed, benign tumors usually don't grow back, whereas cancerous tumors sometimes do.

Benign tumors can sometimes be quite large, however.

Some can cause serious symptoms or be life threatening, such as benign tumors in the brain.

Pneumonia

Bacteria like Streptococcus pneumoniae and Haemophilus influenzae are responsible for the disease pneumonia in humans which infects the alveoli (air filled sacs) of the lungs.

As a result of the infection, the alveoli get filled with fluid leading to severe problems in respiration.

The symptoms of pneumonia include fever, chills, cough and headache. In severe cases, the lips and finger nails may turn gray to bluish in colour.

A healthy person acquires the infection by inhaling the droplets/aerosols released by an infected person or even by sharing glasses and utensils with an infected person.

Respiratory Disorders

Respiratory infection
Genetic
Dust



Thalassemia:

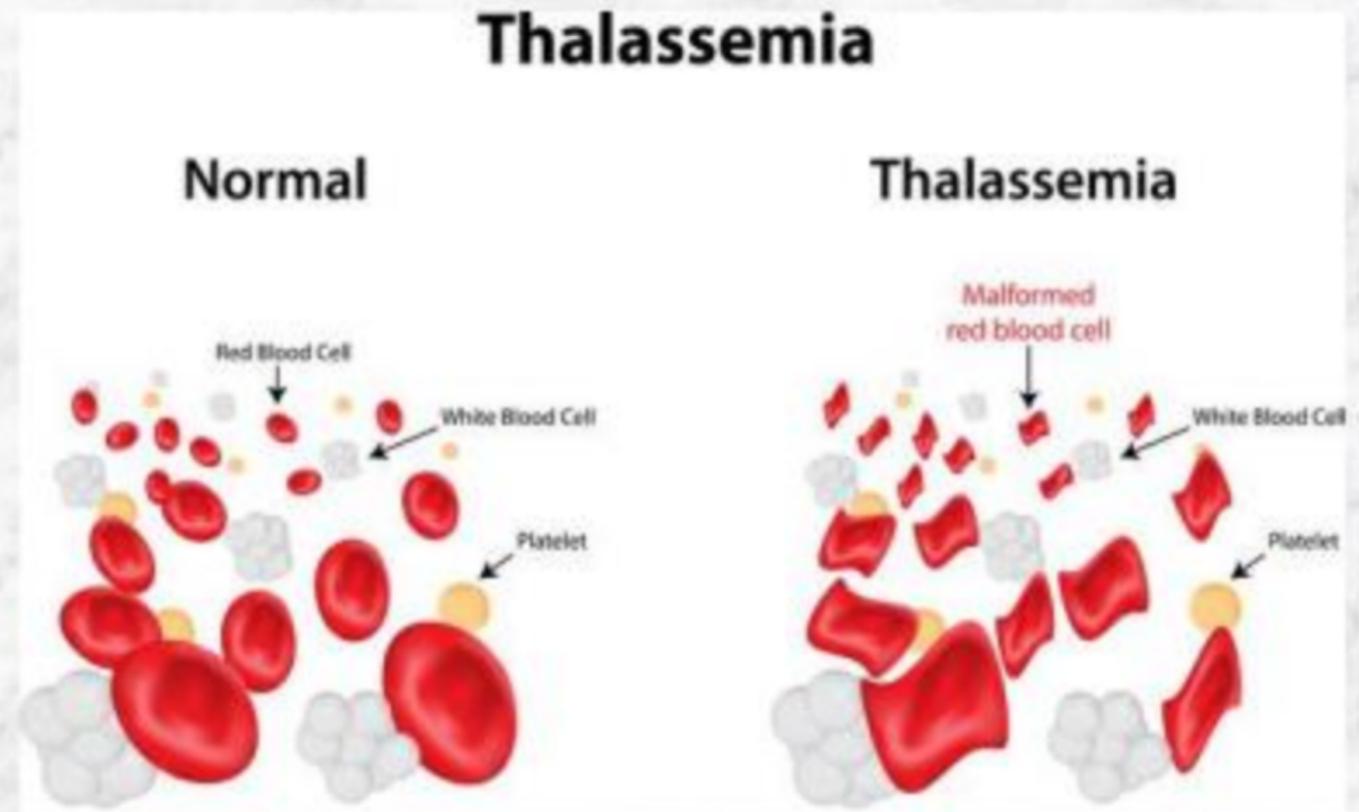
↳ blood disorder

Patients suffering from this disorder are unable to manufacture haemoglobin, the pigment present in red blood corpuscles that carries oxygen to tissues.

This is because the pair of genes controlling haemoglobin production are defective.

Thalassemics (persons suffering from thalassemia) require frequent blood transfusions in order to survive.

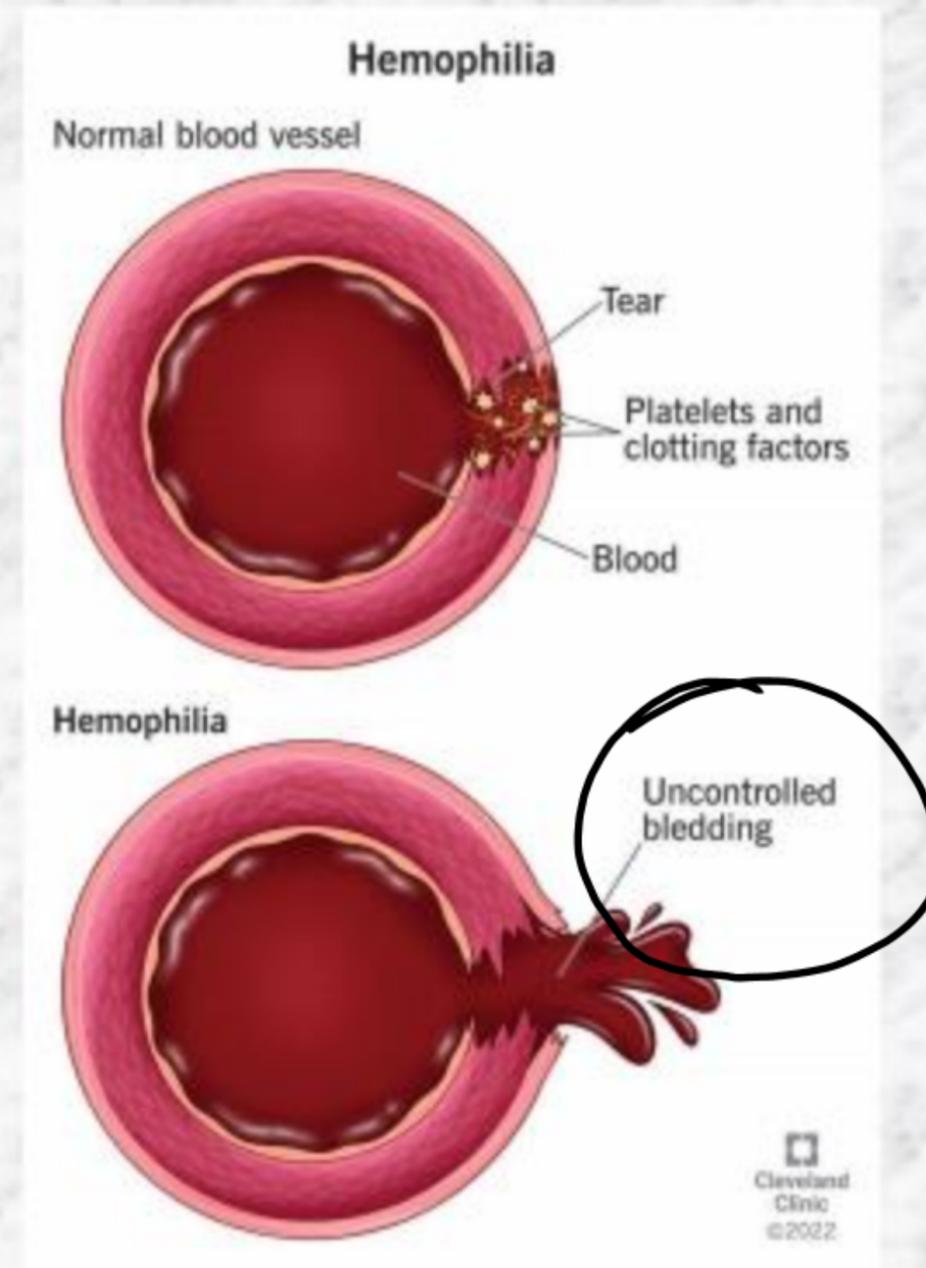
The thalassemia gene is present in an autosome



Haemophilia

Those persons suffering from haemophilia have either a defective gene or lack genes, which control the production of substances responsible for blood clotting.

In the absence of such a substance, blood does not coagulate. Once bleeding starts, it does not clot easily.

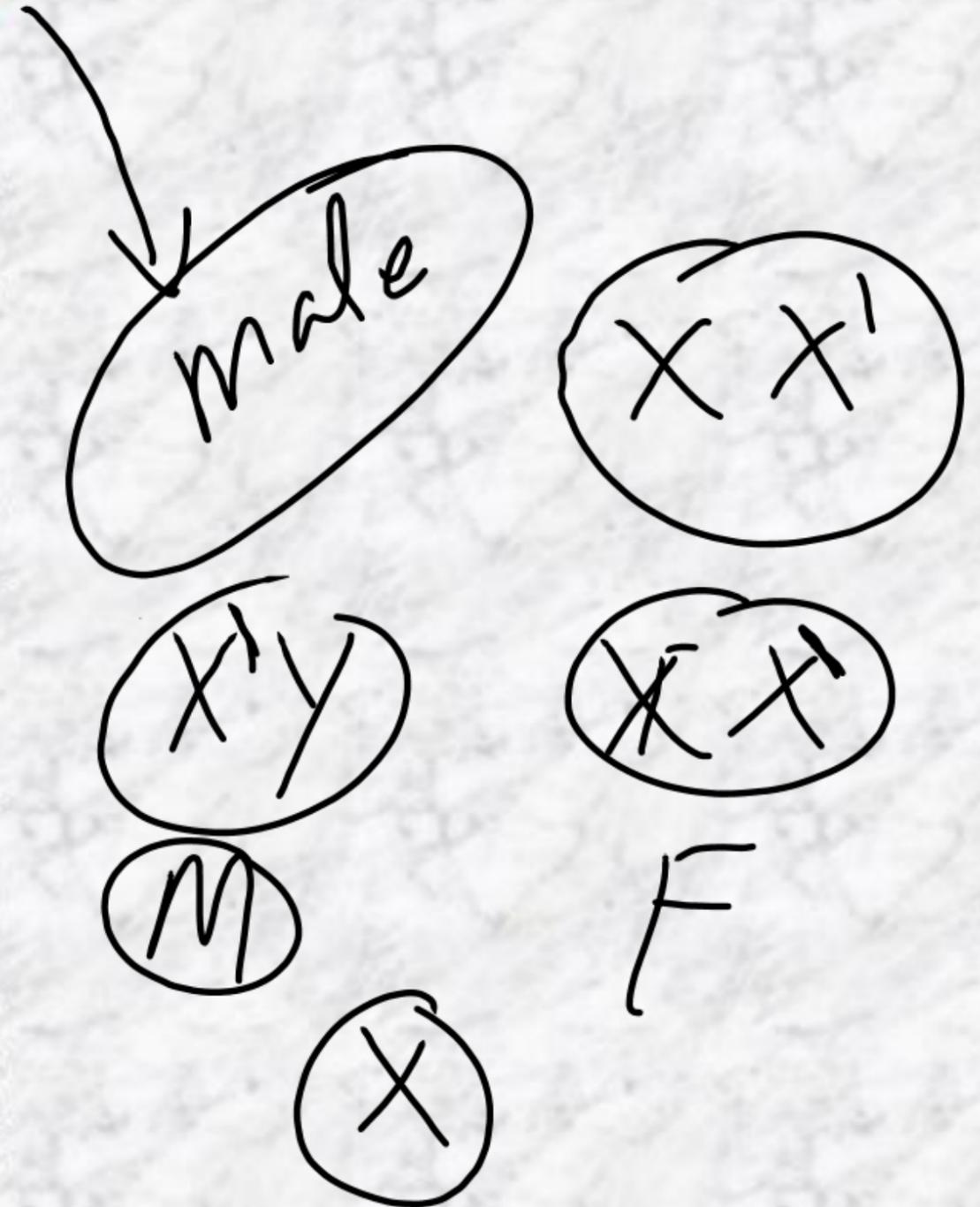


Colour-blindness

Different kinds of colour blindness have been detected but in the most common form of the disorder, a person is unable to distinguish the blue colour from green.

Again this is due to the presence of a defective gene or the absence of the gene, responsible for colour vision.

The genes for both haemophilia and colour blindness are located on the X chromosome, and hence, the disorder is passed down from the mother to the son because a boy receives the X chromosome from the mother and the Y chromosome from the father.



Colour-blindness

In the mother, with two X chromosomes, the defect does not show up.

Also in the daughter, the effect of a defective gene on the X-chromosome inherited from the mother may be masked by a normal gene on the X-chromosome, inherited from her father.

Since the X chromosome bears the defective gene, the son suffers from the genetic disorder, as the male has only one X chromosome and one Y chromosome and so the defective gene does not get masked

Red–green colour blindness

Deuteranopia 



Protanopia 



Blue–yellow colour blindness

Tritanopia 



Complete colour blindness

Monochromatism



Normal colour vision

Sickle Cell Anaemia

India is the second-worst affected country in terms of predicted births with SCA — i.e. chances of being born with the condition.

It changes the shape of red blood cells, making them stiff and sticky, and shaped like sickles or crescent moons.

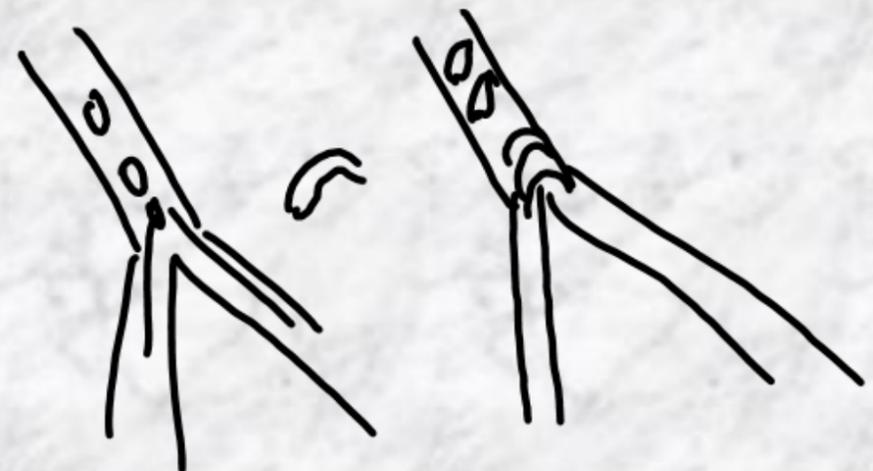
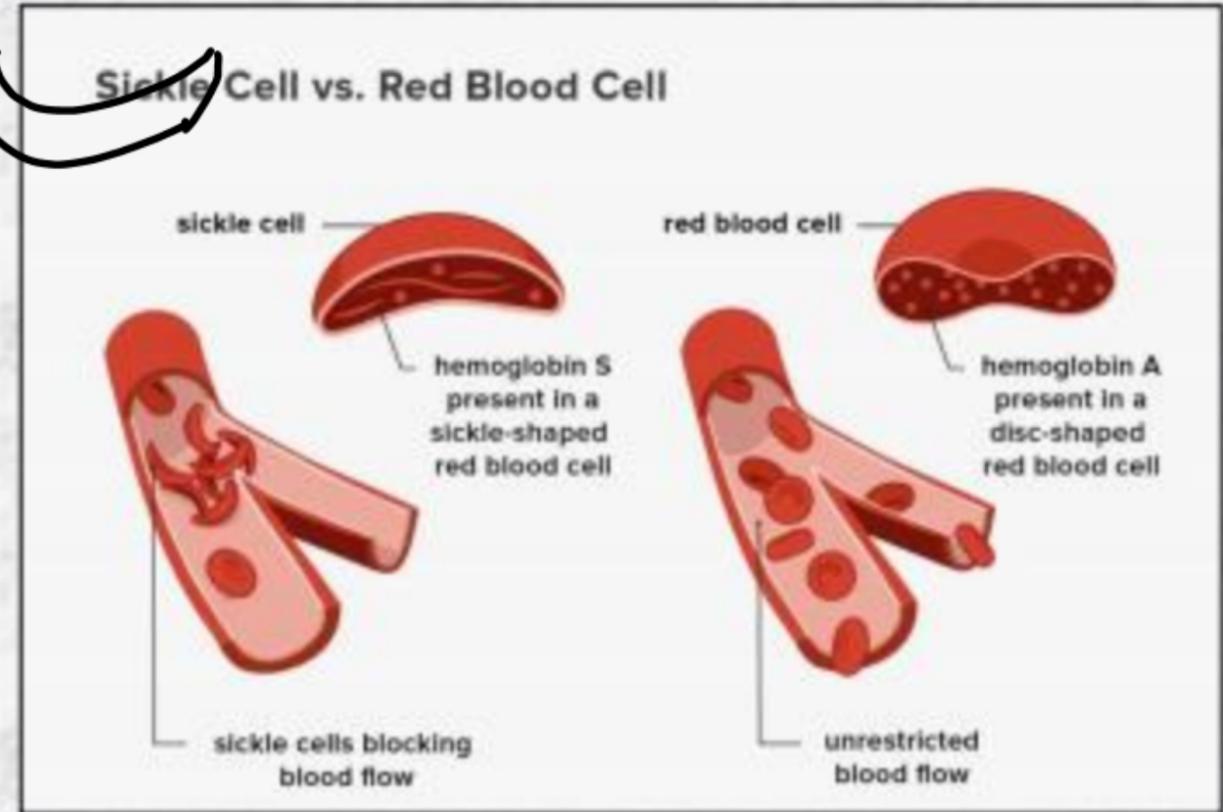
These sickle cells can block blood flow, which can lead to serious complications.

Sickle cell anaemia is caused by inheriting two genes, one from each parent, that code for haemoglobin "S".

Haemoglobin S is an abnormal form of haemoglobin that causes the red cells to become rigid and sickle-shaped

Sickle cell disease is a lifelong illness. It can lead to serious complications including pain, infections, organ damage and failure

A bone marrow transplant is the only cure for some patients with sickle cell disease.



Down's Syndrome

Incidence: Occurs in approx. 1 per 800 live births.

Chromosomal basis: Down syndrome is a genetic condition that arises due to presence of an extra chromosome 21.

Here, chromosome 21 is repeated thrice (trisomy 21), instead of showing up twice in a normal individual

Many people with Down syndrome have the common physical signs and have healthy lives.

But some people with Down syndrome might have one or more birth defects or other health problems. Some of the more common ones include:

Hearing loss, Sleep apnea (a disorder that causes you to repeatedly stop breathing during sleep), Ear infections, Eye diseases, Congenital heart defects (heart defects that are present at birth), Digestive problems, Problems with the upper part of the spine, Obesity

→ Physical Growth
→ Mental Growth
→ Health Challenges

DOWN SYNDROME PHYSICAL CHARACTERISTICS



Klinefelter's syndrome

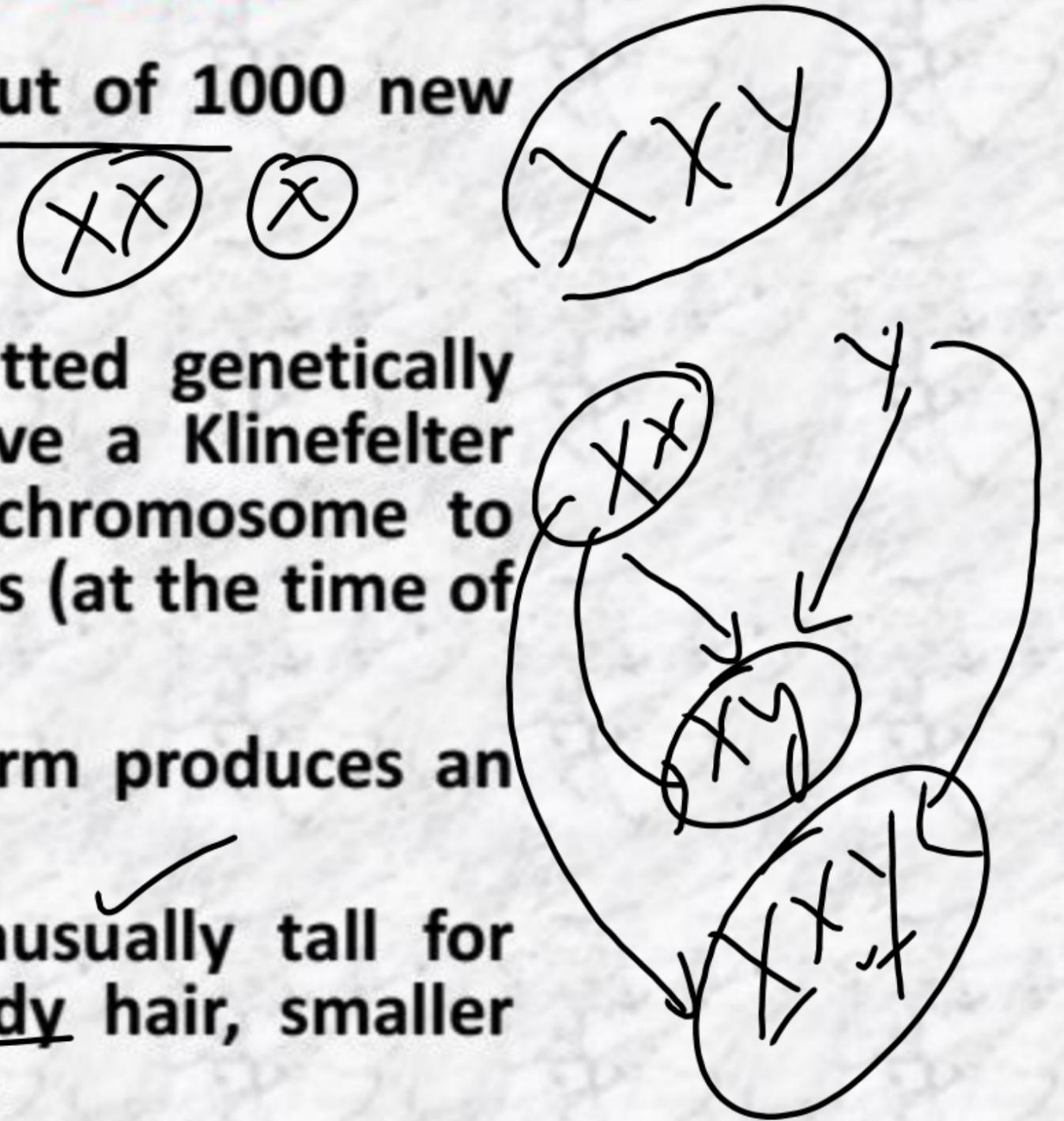
Incidence: Occurs in approximately 1 out of 1000 new born males.

It Affects males.

The extra chromosome is not transmitted genetically (i.e., a Klinefelter newborn cannot have a Klinefelter father) but arises from inability of X chromosome to detach itself from the pair during meiosis (at the time of gamete formation).

Fertilisation of an XX ova with a Y sperm produces an XXY zygote.

Klinefelter's syndrome children are unusually tall for their age, have reduced facial and body hair, smaller testes, enlarged breasts and coarse voice



Turner's Syndrome

Incidence: Occurs in 1 in 2,500 newborn girls, frequently observed in miscarriages and still births.

Turner syndrome is a chromosomal condition that affects development in people who are assigned female at birth.

Females typically have two X chromosomes, but in individuals with Turner syndrome, one copy of the X chromosome is missing or altered.

The most common feature of Turner syndrome is short stature, which becomes evident by about age 5.



Turner's Syndrome

Reduced functioning of the ovaries, the female reproductive organs that produce egg cells (oocytes) and female sex hormones, is also very common.

The ovaries develop normally at first, but egg cells usually die prematurely and most ovarian tissue breaks down before birth.

Many affected individuals do not undergo puberty unless they receive hormone therapy, and most are unable to become pregnant naturally.

What is a drug

A drug is a chemical substance that changes the way our body and mind work. A pharmaceutical preparation or a naturally occurring substance used primarily to alter the physical or mental functioning of an individual, is called a drug.

Life of A drug inside living Body

A Medicine usually goes through 4 stages inside our body, commonly referred to as ADME – Absorption, Distribution, Metabolization, Excretion.

Antibiotic

- Kills the
bacteria/microbes
- help to get rid
of symptoms
- Strengthen Immune
system

Anti-viral

- Get rid of
Symptoms.
- helps to strengthen
immune system
- Control the spread
of virus.

The Journey of a Pill

1.



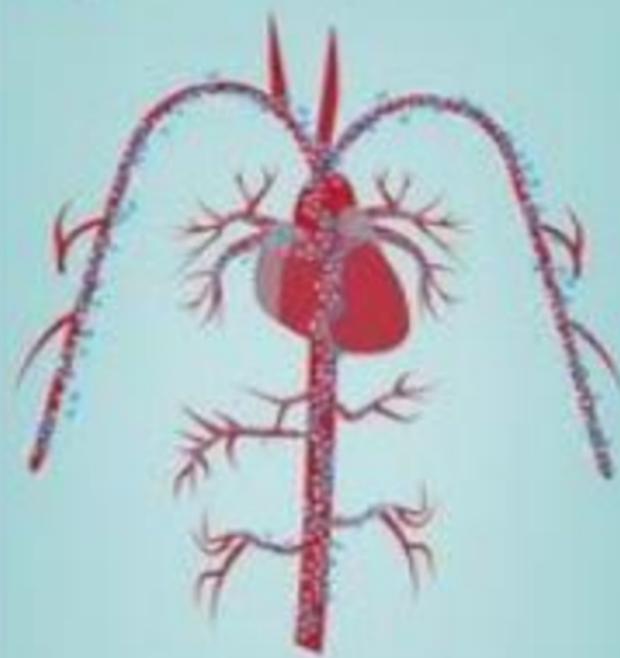
After you swallow a pill, it makes its way to the stomach.

2.



It's broken down in the stomach, small intestine and liver

3.

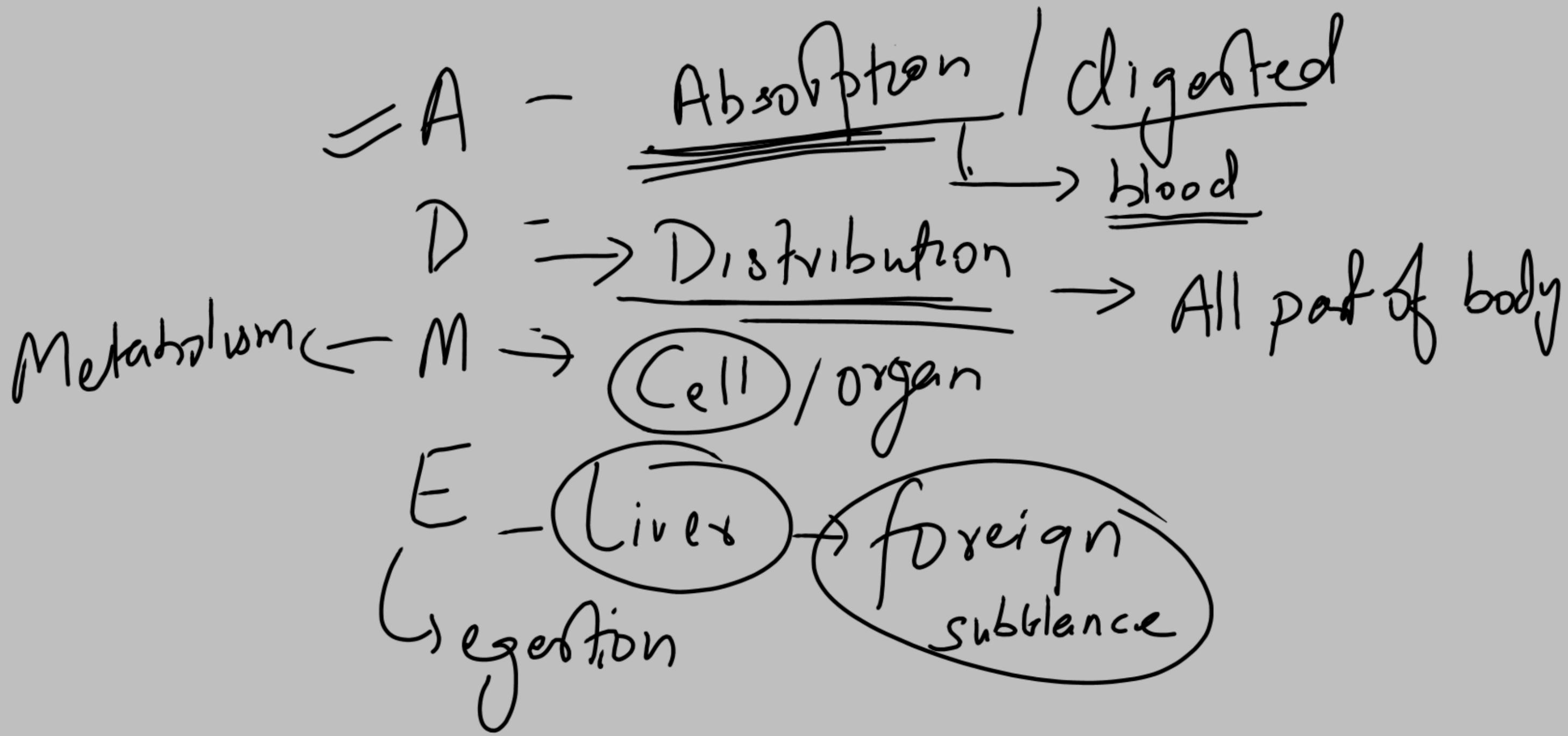


Then circulates through the bloodstream

4.



Until it reaches its target and goes to work



Antibiotics

Antibiotics are medicines that help stop infections caused by bacteria. They do this by killing the bacteria or by keeping them from copying themselves or reproducing.

The word antibiotic means “against life.” Any drug that kills germs in your body is technically an antibiotic. But most people use the term when they’re talking about medicine that is meant to kill bacteria

Before scientists first discovered antibiotics in the 1920s, many people died from minor bacterial infections, like strep throat. Surgery was riskier, too. But after antibiotics became available in the 1940s, life expectancy increased, surgeries got safer, and people could survive what used to be deadly infections.

Only bacterial infections can be killed with antibiotics. The common cold, flu, most coughs, some bronchitis infections, most sore throats, and the stomach flu are all caused by viruses. Antibiotics won’t work to treat them.

Anti Virals

What are antivirals?

Antivirals are medications that help your body fight off certain viruses that can cause disease. Antiviral drugs are also preventive. They can protect you from getting viral infections or spreading a virus to others.

How do antiviral medications work?

Antiviral medicines work differently depending on the drug and virus type. Antivirals can:

- Block receptors so viruses can't bind to and enter healthy cells.
- Boost the immune system, helping it fight off a viral infection.
- Lower the viral load (amount of active virus) in the body.

Anti Virals

Can antivirals cure viral infections?

Antiviral drugs can ease symptoms and shorten how long you are sick with viral infections like the flu and Ebola. They can rid your body of these viruses.

Viral infections like HIV, hepatitis and herpes are chronic. Antivirals can't get rid of the virus, which stays in your body. However, antiviral medicines can make the virus latent (inactive) so that you have few, if any, symptoms. Symptoms that develop while you take antivirals may be less severe or go away faster.

Can antivirals prevent the spread of viral infections?

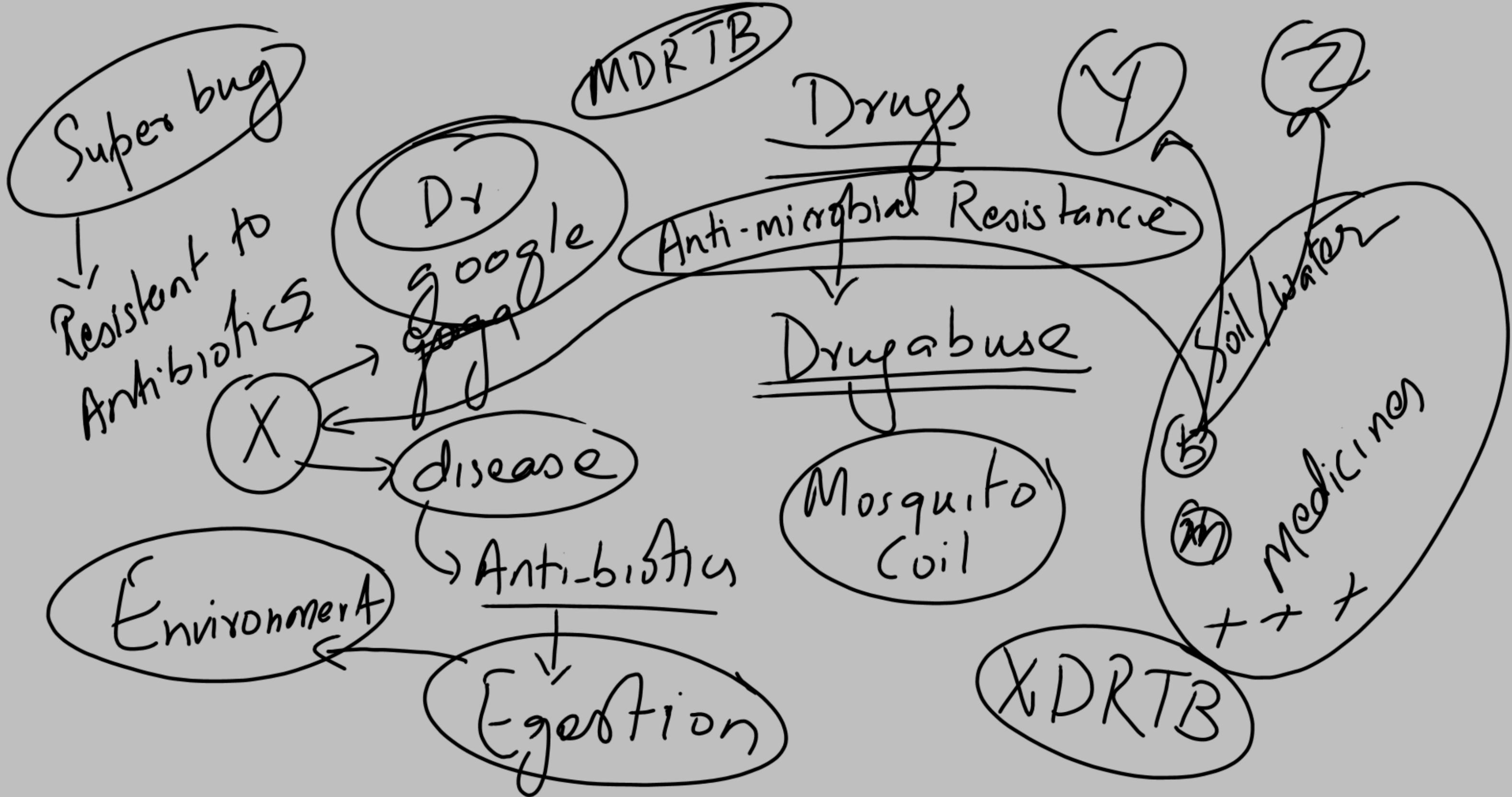
Yes, antiviral drugs can keep you from getting certain viral infections after a suspected or known exposure. For instance, taking specific antivirals:

Anti Virals

- **During pregnancy lowers the risk of a mother passing HIV to her newborn (babies also receive antiviral medicine after delivery).**
- **Daily lowers the risk of giving herpes or HIV to others or getting HIV from an infected partner.**
- **Within 72 hours of a potential HIV exposure can lower the chances of getting infected.**
- **Within 48 hours of exposure to the flu virus may keep you from getting sick.**

Generic Drug and Brand Drug

- **When a new drug is discovered, the company that discovered it would apply for patency to prevent other companies from producing and selling the drug. This patency may take up to 20 years and during this period, the company will produce and sell the drug under a brand name to recover its investment and make a profit. With time, this name becomes synonymous with the drug. But after the patency expires, other companies are allowed to produce a similar drug. It is what gave rise to brand and generic name in drugs.**
- **The difference between brand name and generic drugs is in the circumstances of producing the drugs. While brand name drug refers to the name giving by the producing company, generic drug refers to a drug produced after the active ingredient of the brand name drug. Generic drugs will, however, be sold under different brand names, but will contain the same active ingredients as the brand-name drug. But with regards to the effectiveness of the drugs, generic drugs have the same quality active ingredient as brand name drugs.**



Drug Abuse:

- **Drug abuse occurs when drugs are taken without medical reasons and without medical supervision, especially when they are taken in an amount, strength, frequency, or manner that damages the physical and mental functioning of the individual. Cough syrups, pain killers, and tranquilizers are some common medicines that are often abused.**
- **What is antimicrobial resistance?**
- **Antimicrobial Resistance (AMR) occurs when bacteria, viruses, fungi and parasites change over time and no longer respond to medicines making infections harder to treat and increasing the risk of disease spread, severe illness and death. As a result of drug resistance, antibiotics and other antimicrobial medicines become ineffective and infections become increasingly difficult or impossible to treat.**

Drug Abuse:

- **Recent Findings:**
- **Based on estimates from 204 countries and territories, the Global Research on Antimicrobial Resistance (GRAM) report published in the Lancet provides the most comprehensive estimate of the global impact of AMR so far.**
- **Its headline finding is that as many as 4.95 million deaths may be associated with bacterial AMR in 2019.**
- **Estimates included in the paper show that AMR is a leading cause of death globally, higher than HIV/AIDS or malaria.**
- **In South Asia, over 389,000 people died as a direct result of AMR in 2019.**
- **In 2019, one in five global deaths attributable to AMR occurred in children under the age of five – often from previously treatable infections.**
- **AMR is threatening the ability of hospitals to keep patients safe from infections and undermining the ability of doctors to carry out essential medical practice safely, including surgery, childbirth and cancer treatment since infection is a risk following these procedures.**

Type of Vitamin	Function	Examples of Ingredients
Vitamin A	Vision and cell development in the body	Sweet potato, mangoes, eggs
Vitamin B1	Energy metabolism and nervous system function	Tuna, whole grains, pork
Vitamin B2	Energy metabolism and normal vision	Mushrooms, whole grains, milk
Vitamin B3	Energy metabolism	Whole grains, milk, eggs, meat
Vitamin B5	Energy metabolism	Mushrooms, avocado, beef, poultry
Vitamin B6	Synthesis in new cells	Green leafy vegetables, fruits, fish
Vitamin B7	Energy metabolism	Nuts, egg yolk, liver, fish
Vitamin B9	Synthesis in new cells	Green leafy vegetables, legumes, liver
Vitamin B12	Synthesis in new cells	Lamb, oysters, sardines
Vitamin C	Immunity and formation of collagen in skin	Citrus fruits, strawberries, tomatoes, potatoes
Vitamin D	Maintains calcium and phosphorus in blood	Fatty fish, fish liver oils, eggs
Vitamin E	Antioxidant	Nuts, green leafy vegetables, fish
Vitamin K	Blood clotting	Spinach, green leafy vegetables

UPSC



KHAN GLOBAL STUDIES

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THANKS FOR WATCHING

