

Healthy weight can be calculate using waist:hip ratio and the equation for BMI.

$$BMI = \frac{mass (kg)}{(height (m))^2}$$

Non-communicable diseases are caused by the interaction of a number of factors	Disease	Interacting factors
	Cardiovascular disease	Diet, obesity, smoking, drinking alcohol, lack of exercise, genetics.
	Cancer	
	Lung disease	
	Liver disease	
	Malnutrition	

Lifestyle factors and their effects on non-communicable disease

Disease	lifestyle factors
Obesity and malnutrition	Lack of exercise and consuming too many/too few calories through an unbalanced diet. Schools meals are balanced to combat this in young people.
Liver disease	Large amounts of alcohol taken over a long period of time can lead to liver disease e.g. cirrhosis. The NHS spends over £500 million a year treating liver disease.
Cardiovascular disease	Smoking leads to damage and blocking of arteries supplying the heart with oxygenated blood. WHO estimates that 6 million people die globally as a result of smoking related illnesses.

Drugs (including antibiotics) have to be tested and trialled before to check they are safe and effective

Discovery of new drugs

EDEXCEL GCSE HEALTH DISEASE AND MEDICINE part 3

Treating CVD

Monoclonal antibodies (Biology only HT)

Evaluating different treatments for cardiovascular disease (CVD)

Life long medication	Surgical procedures	Lifestyle changes
Medicines to reduce blood pressure and cholesterol. Statins for lowering cholesterol carry a small risk of developing diabetes.	A stent can be surgically inserted into blocked blood vessel. Blocked blood vessels can be bypassed with inserted blood vessels. This treatment requires life long medication.	Giving up smoking, drinking excess alcohol and taking more exercise can reduce the risk of CVD. Some patients may not stick to lifestyle changes.

New drugs are extensively tested for:	Efficacy	Make sure the drug works
	Toxicity	Check that the drug is not poisonous
	Dose	The most suitable amount to take

Preclinical trials - using cells, tissues and live animals - must be carried out before the drug can be tested on humans.

Clinical trials use healthy volunteers and patients

Stage 1	Stage 2	Stage 3	Stage 4
Healthy volunteers try small dose of the drug to check it is safe record any side effects	A small number of patients try the drug at a low dose to see if it works	A larger number of patients; different doses are trialled to find the optimum dose	A double blind trial will occur. The patients are divided into groups. Some will be given the drug and some a placebo.



Double blind trial: patients and scientists do not know who receives the new drug or placebo until the end of the trial. This avoids bias.

A placebo can look identical to the new drug but contain no active ingredients

Monoclonal antibodies	Identical copies of one types of antibody produced in laboratory	1. A mouse is injected with pathogen.
		2. Lymphocytes produce antibodies (but do not divide).
		3. Lymphocytes are removed from the mouse and fused with rapidly dividing mouse tumour cells.
		4. The new cells are called hybridomas.
		5. The hybridomas divide rapidly and release lots of antibodies which are then collected.

Monoclonal antibodies can be used in a variety of ways

Testing	Diagnosis
e.g. pregnancy test – measure the level of hormones	Can detect very small quantities of chemicals in the blood

Specific to one binding site on the antigen. Can target specific chemicals or cells in the body unlike drug and radiotherapy treatments.