**Anatomy and Physiology and medical terminology**

**Level 2 Workbook**

**(To be completed and returned to the academy 1 week prior to starting Supporting the patient journey module MM PJ(Ad)1 or medical terminology course)**

**If you do not return the workbook by the required date you will be unable to attend the course**

**Please return completed workbook to**

**Karen Davies**

**Training & Development Co-ordinator**

**Wider Workforce**

**The Academy**

**GWH**

**Email: karent.davies@gwh.hs.uk**

|  |
| --- |
| **Name:** |
| **Department** |
| **Role** |

**INDEX**

|  |  |
| --- | --- |
| **Title of section** | **Page** |
|  |  |
| 1. The Circulatory System | 3 |
| 1. The Respiratory System | 5 |
| 1. The Skeletal System | 7 |
| 1. The Digestive System | 9 |
| 1. The Urinary System | 10 |
| 1. The Skin | 11 |
| 1. The Nervous System | 12 |
| 1. The Female Reproductive System | 16 |
| 1. The Male Reproductive System | 17 |
| 1. Medical Terminology | 20 |
| 1. Glossary and Acronyms | 25 |

**The circulatory system**

The circulatory system consists of 3 main components:

* The heart
* The blood vessels
* Blood

The heart is the centre of the circulatory system, it is a muscle situated a little to the left of the centre of your chest. It is made up of 3 layers, the pericardium: the outer sack, the myocardium: the muscular wall and the endocardium, which is the inner lining of the heart. It pumps blood around your body through arteries and veins.

The heart has four chambers. The two atria collect the blood and the two ventricles pump the blood out of the heart. This action can be detected when we take the pulse at points on the body where a large artery passes close to the skin. Our normal pulse rate is 60-80 beats per minute or approximately 100,000 beats per day.

Valves prevent the blood from flowing backwards.

The septum separates the two sides of the heart.

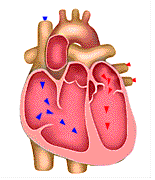
The right side of the heart pumps de-oxygenated blood (blood not containing oxygen) to the lungs to pick up oxygen. The left side of the heart pumps the oxygenated blood from the lungs around the rest of the body.

The body needs a steady supply of blood circulating around the body to keep a good supply of oxygen supplied to all the cells. This is called the circulation. We have approx. 8 pints of blood in the body.

It is a double circulatory system. It comprises two separate circuits and blood passes through the heart twice.

The pulmonary circulation carries blood to the lungs to be oxygenated and then back to the heart. In the lungs, carbon dioxide is removed from the blood, and oxygen taken up by the haemoglobin in the red blood cells.

The systemic circulation carries blood around the body to deliver the oxygen and returns de-oxygenated blood to the heart. Blood also carries nutrients and waste.



The arteries take blood away from your heart and the veins return blood to the heart. These are called the blood vessels.

There are three types of blood vessel:

**Arteries**

* Carry blood away from the heart (always oxygenated apart from the pulmonary artery which goes to the lungs)
* Have thick muscular walls
* Have small passageways for blood (internal **lumen**)
* Contain blood under high pressure

**Veins**

* Carry blood to the heart (always de-oxygenated apart from the pulmonary vein which goes from the lungs to the heart)
* Have thin walls
* Have larger internal lumen
* Contain blood under low pressure
* Have valves to prevent blood flowing backwards

**Capillaries**

* Found in the muscles and lungs
* Microscopic – one cell thick
* Very low blood pressure
* Where **gas exchange** takes place. Oxygen passes through the capillary wall and into the tissues, carbon dioxide passes from the tissues into the blood
* **Blood**

Blood has four key components:

Plasma

* Fluid part of blood
* Carries carbon dioxide, hormones and waste

Red blood cells

* Contain haemoglobin which carries oxygen
* Made in the bone marrow. The more you train the more red blood cells are made.

White blood cells

* An important part of the immune system, they produce antibodies and destroy harmful micro-organisms
* Made in the bone marrow

Platelets

* Clump together to form clots
* Protect the body by stopping bleeding

|  |
| --- |
| Name 4 conditions associated with the Heart.  1.  2.  3.  4. |

**Respiratory System (Breathing)**

Your lungs are situated in your chest and are the largest organ in the body. You have 2 lungs, the left hand side being slightly smaller to make way for the heart. They are protected by your ribs and underneath is the diaphragm that help the lungs to inhale and exhale. Respiration is the term for the exchange of oxygen from the environment for carbon dioxide from the body's cells. The process of taking air into the lungs is called inhalation or inspiration, and the process of breathing it out is called exhalation or expiration.We breathe approximately 9-14 times per minute.

The two openings of the airway (the nasal cavity and the mouth) meet at the pharynx, or throat, at the back of the nose and mouth. The pharynx is part of the digestive system as well as the respiratory system because it carries both food and air. At the bottom of the pharynx, the pathway for both food and air divides in two. One passageway is for food (the oesophagus, which leads to the stomach) and the other for air. The epiglottis, a small flap of tissue, covers the air-only passage when we swallow, keeping food and liquid from going into our lungs.

The larynx, or voice box, is the uppermost part of the air-only passage. This short tube contains a pair of vocal cords, which vibrate to make sounds. The trachea, or windpipe, extends downward from the base of the larynx. It lies partly in the neck and partly in the chest cavity. The walls of the trachea are strengthened by stiff rings of cartilage to keep it open so air can flow through on its way to the lungs. The trachea is also lined with cilia, which sweep fluids and foreign particles out of the airway so that they stay out of the lungs.

At its bottom end, the trachea divides into left and right air tubes called bronchi, which connect to the lungs. Within the lungs, the bronchi branch into smaller bronchi and even smaller tubes called bronchioles. Bronchioles, which are as thin as a strand of hair, end in tiny air sacs called alveoli. Each of us has hundreds of millions of alveoli in our lungs — enough to cover a tennis court if they were spread out on the ground. The alveoli are where the exchange of oxygen and carbon dioxide takes place.

With each inhalation, air fills a large portion of the millions of alveoli. In a process called diffusion, oxygen moves from the alveoli to the blood through the capillaries (tiny blood vessels) that line the alveolar walls. Once in the bloodstream, oxygen gets picked up by a molecule called heamoglobin in the red blood cells. This oxygen-rich blood then flows back to the heart, which pumps it through the arteries to oxygen-hungry tissues throughout the body.

In the tiny capillaries of the body tissues, oxygen is freed from the heamoglobin and moves into the cells. Carbon dioxide, which is produced during the process of diffusion, moves out of these cells into the capillaries, where most of it is dissolved in the plasma of the blood. Blood rich in carbon dioxide then returns to the heart via the veins. From the heart, this blood is pumped to the lungs, where carbon dioxide passes into the alveoli to be exhaled.

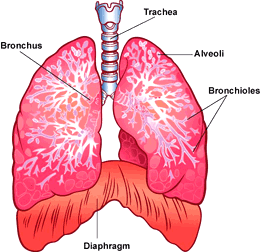
The lungs also contain elastic tissues that allow them to inflate and deflate without losing shape and are encased by a thin lining called the pleura. This network of alveoli, bronchioles, and bronchi is known as the bronchial tree.

The chest cavity, or thorax, is the airtight box that houses the bronchial tree, lungs, heart, and other structures. The top and sides of the thorax are formed by the ribs and attached muscles, and the bottom by a large muscle called the diaphragm. The chest walls form a protective cage around the lungs and other contents of the chest cavity.

The diaphragm, which separates the chest from the abdomen, plays a lead role in breathing. When we breathe out, the diaphragm moves upward, forcing the chest cavity to get smaller and pushing the gases in the lungs up and out of the nose and mouth.

When we breathe in, the diaphragm moves downward toward the abdomen, and the rib muscles pull the ribs upward and outward, enlarging the chest cavity and pulling air in through the nose or mouth. Air pressure in the chest cavity and lungs is reduced, and because gas flows from high pressure to low, air from the environment flows through the nose or mouth into the lungs.

As we exhale, the diaphragm moves upward and the chest wall muscles relax, causing the chest cavity to contract. Air pressure in the lungs rises, so air flows from the lungs and up and out of respiratory system through the nose or mouth



|  |
| --- |
| What happens to the lungs when a patient has:   * 1. Asthma   2. COPD |

**The skeletal system**

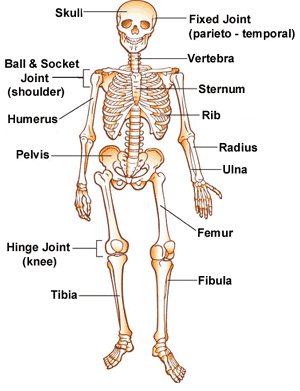
The human skeleton has 206 bones and 5 main functions these are:

1. **Protection** - the cranium protects the brain and the ribs vital organs in the chest.
2. **Shape** - gives shape to the body and makes you tall or short.
3. **Support** - holds your vital organs in place. The vertebral column holds the body upright.
4. **Movement** - muscle are attached to bones, which are jointed. When the muscles contract the bones move.
5. **Blood production** - red blood cells (to carry oxygen) and white blood cells (to protect against infection) are produced in the bone marrow of some bones.

.

Bones are living organs that grow and change all the time.

The main bones of the body are:



When 2 bones meet this is called a joint. There are 3 main types of joints:

* Fixed joint: the skull
* Hinge joint: the knee, elbow and ankle
* Ball and socket joint: shoulder and hip

The joints are held in place by ligaments which help control movement and prevent injury.

Muscles

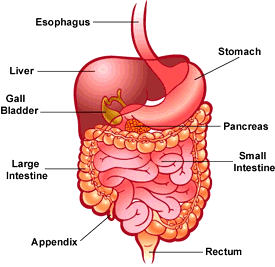
We have over 600 muscles in our body split into 3 different types.

* Smooth muscle: usually in sheets or layers and out of our control. E.g. behind the eyes, around the bladder and in digestive system.
* Cardiac muscle: the heart contacts and is not controlled by us
* Skeletal muscles: these can be controlled by us and work with the skeleton to give power and strength.

|  |
| --- |
| Describe how bones heal when they sustain a fracture/broken bone? |

**The digestive system**

Our digestive system goes from our mouth to our bottoms (Anus). It consists of mouth, oesophagus, stomach, small intestine, large intestine, rectum and anus. The function of this system is to allow us to take in food and water, extract what we need from it and get rid of things we don’t need. The stomach produces two chemicals called hydrochloric acid and pepsin, which are extremely acidic and could cause significant damage to the stomach lining. However, the stomach produces a neutralising mucous to prevent this from happening. Peristalsis occurs when the smooth muscle of the small and large intestine contracts to move the food through the bowel, and stop it from moving back into the mouth and exit the body via the rectum.



**Oesophagus**

There are 4 main processes

* Ingestion
* Digestion
* Absorption
* Elimination

Various organs help with this process including the gall bladder, liver and pancreas. All waste products are excreted as faeces (stools, poo, motions).

|  |
| --- |
| **Name 4 things that can affect the way we digest food?**  **1.**  **2.**  **3.**  **4.** |

**Urinary System**

The body produces urine as a way of getting rid of waste products. Before leaving our bodies it passes through our urinary system. Four main components make up this system:

* The kidneys: 2 bean shaped organs that filter waste products from blood and produce urine.
* Ureters: the tubes that take urine from each kidney to the bladder.
* Bladder: this is a holding sack for the urine from the kidneys.
* Urethra: this is the tube that takes the urine from the bladder into the toilet.

Your body takes nutrients from food and uses them to maintain all bodily functions including energy and self-repair. After your body has taken what it needs from the food, waste products are left behind in the blood and in the bowel. The urinary system works with the lungs, skin, and intestines, all of which also excrete waste to keep the chemicals and water in your body balanced. Adults eliminate about a 1-2 litres of urine each day. The amount depends on many factors, especially the amounts of fluid and food a person consumes and how much fluid is lost through sweat and breathing. Certain types of medications can also affect the amount of urine passed.

The urinary system removes a type of waste called urea from your blood. Urea is produced when foods containing protein, such as meat, poultry, and certain vegetables, are broken down in the body. Urea is carried in the bloodstream to the kidneys.

The kidneys are bean-shaped organs about the size of your fists. They are near the middle of the back, just below the rib cage. The kidneys remove urea from the blood through tiny filtering units called Nephrons. Each Nephron consists of a ball formed of small blood capillaries, called a Glomerulus, and a small tube called a renal tubule. Urea, together with water and other waste substances, forms the urine as it passes through the Nephrons and down the renal tubules of the kidney.

From the kidneys, urine travels down two thin tubes called Ureters to the bladder. The Ureters are about 8 to 10 inches long. Muscles in the Ureter walls constantly tighten and relax to force urine downward away from the kidneys. If urine is allowed to stand still, or back up, a kidney infection can develop. Small amounts of urine are emptied into the bladder from the Ureters about every 10 to 15 seconds.

The bladder is a hollow muscular organ shaped like a balloon. It sits in your pelvis and is held in place by ligaments attached to other organs and the pelvic bones. The bladder stores urine until you are ready to empty it. It swells into a round shape when it is full and gets smaller when empty. If the urinary system is healthy, the bladder can hold up to 600mls of urine comfortably for 2 to 5 hours.

Circular muscles called sphincters help keep urine from leaking. The sphincter muscles close tightly like a rubber band around the opening of the bladder into the urethra, the tube that allows urine to pass outside the body.

Nerves in the bladder tell you when it is time to urinate, or empty your bladder. As the bladder first fills with urine, you may notice a feeling that you need to urinate. The sensation to urinate becomes stronger as the bladder continues to fill and reaches its limit. At that point, nerves from the bladder send a message to the brain that the bladder is full, and your urge to empty your bladder intensifies.

When you urinate, the brain signals the bladder muscles to tighten, squeezing urine out of the bladder. At the same time, the brain signals the sphincter muscles to relax. As these muscles relax, urine exits the bladder through the urethra. When all the signals occur in the correct order, normal urination occurs.

|  |
| --- |
| **Describe how the colour of the urine can vary and why.** |

**The skin**

The skin is the body’s biggest organ and its functions are:

* Temperature control
* Protects our skeleton and internal organs
* Allows us to have a sense of touch.
* Excretion
* Synthesis of vitamin D

The skin is made up of 3 layers:

* The epidermis: this is the part of the skin you can see. These are dead skin cells pushed to the top of the epidermis to make way for new skin cells. This decreases as we age
* The dermis: this contains nerve endings, blood vessels, oil and sweat glands.
* The subcutaneous level: it is mostly made of fat and helps the body stay warm and absorb shocks. As we age this layer starts to degenerate and causes thinning of the skin.

|  |
| --- |
| State 4 things that may cause the skin to breakdown.  1.  2.  3.  4. |

**The Nervous system**

This is divided into 3 parts:

* The central nervous system. This consists of the brain and spinal cord.
* The peripheral nervous system. This is comprised of sensory and motor nerves. The brain uses these nerves to send messages to the muscles.
* The autonomic nervous system. This system controls activity in the body without the use of your conscious mind.

**The Central Nervous system**

* The Cerebrum

The biggest part of the brain is the cerebrum. The cerebrum makes up 85% of the brain's weight. The cerebrum is the thinking part of the brain and controls your voluntary muscles — the ones that move when you want them to. When you're thinking hard, you're using your cerebrum. You need it to solve math problems, figure out a video game, and draw a picture. Your memory lives in the cerebrum — both short-term memory (what you ate for dinner last night) and long-term memory (Your holiday 3 years ago) The cerebrum also helps with reasoning. The cerebrum has two halves, with one on either side of the head.

* The Cerebellum

 The cerebellum is at the back of the brain, below the cerebrum. It's a lot smaller than the cerebrum at only 1/8 of its size. It controls balance, movement, and coordination (how your muscles work together). Because of your cerebellum, you can stand upright, keep your balance, and move around.

* Brain Stem

The brain stem sits beneath the cerebrum and in front of the cerebellum. It connects the rest of the brain to the spinal cord, which runs down your neck and back. The brain stem is in charge of all the functions your body needs to stay alive, like breathing air, digesting food, and circulating blood.

Part of the brain stem's job is to control involuntary muscles — the ones that work automatically, without thinking about it. There are involuntary muscles in the heart and stomach, and it's the brain stem that tells the heart to pump more blood when exercising or to tell the stomach to start digesting food. The brain stem also sorts through the millions of messages that the brain and the rest of the body send back and forth.

* Pituitary Gland

The pituitary gland is very small — only about the size of a pea! Its job is to produce and release hormones into the body. This gland also plays a role with lots of other hormones, like ones that control the amount of sugars and water in the body. And it helps keep your metabolism going. The metabolism is everything that goes on in the body to keep it alive and growing and supplied with energy, like breathing, digesting food, and moving blood around.

* Hypothalamus

The hypothalamus knows what temperature the body should be (about 98.6° Fahrenheit or 37° Celsius). If the body is too hot, the hypothalamus tells it to sweat. If it’s too cold, the hypothalamus tells the body to shiver. Both [shivering](http://kidshealth.org/kid/talk/qa/shiver.html) and [sweating](http://kidshealth.org/kid/talk/yucky/sweat.html) are attempts to get the body's temperature back where it needs to be.

* The spinal cord

The Spinal Cord is connected to the brain and is about the diameter of a human finger. From the brain the spinal cord descends down the middle of the back and is surrounded and protected by the bony vertebral column. The spinal cord is surrounded by a clear fluid called Cerebral Spinal Fluid (CSF), that acts as a cushion to protect the delicate nerve tissues against damage from banging against the inside of the vertebrae.

The spinal cord consists of millions of nerve fibres which transmit electrical information to and from the limbs, trunk and organs of the body, back to and from the brain. The nerves which exit the spinal cord in the upper section, the neck control breathing and the arms. The nerves which exit the spinal cord in the mid and lower section of the back control the trunk and legs, as well as bladder, bowel and sexual function.

The nerves which carry information from the brain to muscles are called Motor Neurones. The nerves which carry information from the body back to the brain are called Sensory Neurones. Sensory Neurones carry information to the brain about skin temperature, touch, pain and joint position.

**The Peripheral Nervous system**

The nerves connecting the spinal cord to the body are referred to as the Peripheral Nervous System.

Nerves called the spinal nerves or nerve roots branch off the spinal cord and pass out through a hole in each of the vertebrae called the Foramen. These nerves carry information from the spinal cord to the rest of the body and from the body back up to the brain.

There are four main groups of spinal nerves, which exit different levels of the spinal cord. These are in descending order down the vertebral column:

**Cervical Nerves "C" :** (nerves in the neck) supply movement and feeling to the arms, neck and upper trunk. Also control breathing.

**Thoracic Nerves "T" :** (nerves in the upper back) supply the trunk and abdomen.

**Lumbar Nerves "L" and Sacral Nerves "S" :** (nerves in the lower back) supply the legs, the bladder, bowel and sexual organs.

[Listen](http://app.readspeaker.com/cgi-bin/rsent?customerid=5202&lang=en_us&voice=Kate&speed=100&readid=whichRead_5&url=http%3A//kidshealth.org/kid/cancer_center/HTBW/brain.html&mdid=5&audiofilename=KidsHealth_Your_Brain_%26_Nervous_System)

**Emotion Location**

With all the other things it does, is it any surprise that the brain runs your emotions? Maybe you got the exact toy you wanted for your birthday and you were really happy. Or your friend is sick and you feel sad. Or your little brother messed up your room, so you're really angry! Where do those feelings come from? Your brain, of course.

Your brain has a little bunch of cells on each side called the amygdala (say: uh-**mig**-duh-luh). The word amygdala is Latin for almond, and that's what this area looks like. Scientists believe that the amygdala is responsible for emotion. It's normal to feel all different kinds of emotions, good and bad. Sometimes you might feel a little sad, and other times you might feel scared, or silly, or glad.

**Be Good to Your Brain**

So what can you do for your brain? Plenty.

* Eat healthy foods. They contain potassium and calcium, two minerals that are important for the nervous system.
* Get a lot of playtime (exercise).
* Wear a helmet when you ride your bike or play other sports that require head protection.
* Don't drink alcohol, take drugs, or use tobacco.
* Use your brain by doing challenging activities, such as puzzles, reading, playing music, making art, or anything else that gives your brain a workout!

Reviewed by: [Steven Dowshen, MD](http://kidshealth.org/parent/misc/reviewers.html)  
Date reviewed: June 2010

**The Autonomic Nervous System**

The ANS affects heart rate, digestion, respiratory rate, salivation, perspiration, pupillary, micturition, (urination), and sexual arousal. Most autonomic functions are involuntary but a number of ANS actions can work alongside some degree of conscious control. Everyday examples include breathing, swallowing, and sexual arousal, and in some cases functions such as heart rate.

ANS innervation is divided into [sympathetic nervous system](http://en.wikipedia.org/wiki/Sympathetic_nervous_system) and [parasympathetic nervous system](http://en.wikipedia.org/wiki/Parasympathetic_nervous_system).

* Sympathetic Nervous System

Promotes a "[fight or flight](http://en.wikipedia.org/wiki/Fight_or_flight_response)" response, corresponds with arousal and energy generation, and inhibits digestion.

* Diverts blood flow away from the gastro-intestinal (GI) tract and [skin](http://en.wikipedia.org/wiki/Skin) via vasoconstriction.
* Blood flow to [skeletal muscles](http://en.wikipedia.org/wiki/Skeletal_muscle) and the [lungs](http://en.wikipedia.org/wiki/Lung) is enhanced (by as much as 1200% in the case of skeletal muscles).
* Dilates bronchioles of the lung, which allows for greater alveolar oxygen exchange.
* Increases [heart rate](http://en.wikipedia.org/wiki/Heart_rate) and the [contractility](http://en.wikipedia.org/wiki/Contractility) of cardiac cells, thereby providing a mechanism for the enhanced blood flow to skeletal muscles.
* Dilates pupils and relaxes the ciliary muscle to the lens, allowing more light to enter the eye and far vision.
* Provides vasodilatation for the [coronary vessels](http://en.wikipedia.org/wiki/Coronary_vessels) of the [heart](http://en.wikipedia.org/wiki/Heart).
* Constricts all the intestinal [sphincters](http://en.wikipedia.org/wiki/Sphincters) and the urinary sphincter.
* Inhibits [peristalsis](http://en.wikipedia.org/wiki/Peristalsis).
* Stimulates [orgasm](http://en.wikipedia.org/wiki/Orgasm).
* Parasympathetic Nervous System

Promotes a "rest and digest" response, promotes calming of the nerves return to regular function, and enhances digestion.

* Dilates blood vessels leading to the GI tract, increasing blood flow. This is important following the consumption of food, due to the greater metabolic demands placed on the body by the gut.
* The parasympathetic nervous system can also constrict the bronchiolar diameter when the need for oxygen has diminished.
* Dedicated cardiac branches of the [Vagus](http://en.wikipedia.org/wiki/Vagus) and thoracic [Spinal Accessory](http://en.wikipedia.org/wiki/Accessory_nerve) nerves impart [Parasympathetic](http://en.wikipedia.org/wiki/Parasympathetic) control of the [Heart](http://en.wikipedia.org/wiki/Heart) or [Myocardium](http://en.wikipedia.org/wiki/Myocardium).
* During [accommodation](http://en.wikipedia.org/wiki/Accommodation_(eye)), the parasympathetic nervous system causes constriction of the pupil and contraction of the ciliary muscle to the lens, allowing for closer vision.
* The parasympathetic nervous system stimulates salivary gland secretion and accelerates [peristalsis](http://en.wikipedia.org/wiki/Peristalsis).
* Is also involved in erection of genitals, via the [pelvic nerves](http://en.wikipedia.org/wiki/Pelvic_splanchnic_nerves).
* Stimulates sexual arousal.

|  |
| --- |
| Name and describe 2 conditions that affect the nervous systems: |

**The Reproductive system**

**Female**

A female's internal reproductive organs are the vagina, uterus, fallopian tubes, and ovaries.

The vagina is a muscular, hollow tube that extends from the vaginal opening to the uterus. The vagina is about 3 to 5 inches (8 to 12 centimeters) long in a grown woman. Because it has muscular walls it can expand and contract. This ability to become wider or narrower allows the vagina to accommodate something as slim as a tampon and as wide as a baby. The vagina's muscular walls are lined with mucous membranes, which keep it protected and moist. The vagina has several functions: for sexual intercourse, as the pathway that a baby takes out of a woman's body during childbirth, and as the route for the menstrual blood (the period) to leave the body from the uterus. The vagina connects with the **uterus**, or womb, at the cervix.

The uterus is shaped like an upside-down pear, with a thick lining and muscular walls. At the upper corners of the uterus, the **fallopian** tubes connect the uterus to the **ovaries.** The ovaries are two oval-shaped organs that lie to the upper right and left of the uterus. They produce, store, and release eggs into the fallopian tubes in the process called **ovulation.**  Each ovary measures about 1½ to 2 inches (4 to 5 centimeters) in a grown woman.

There are two fallopian tubes, each attached to a side of the uterus. The fallopian tubes are about 4 inches (10 centimeters) long and about as wide as a piece of spaghetti. Within each tube is a tiny passageway no wider than a sewing needle. At the other end of each fallopian tube is a fringed area that looks like a funnel. This fringed area wraps around the ovary but doesn't completely attach to it. When an egg pops out of an ovary, it enters the fallopian tube. Once the egg is in the fallopian tube, tiny hairs in the tube's lining help push it down the narrow passageway toward the uterus. The ovaries are also part of the endocrine system because they produce female sex hormones such as estrogen and progesterone

**The Female reproductive system**



Vagina

Cervix

Uterus

Fallopian Tube

Ovary

|  |
| --- |
| **Explain these terms:**  Myomectomy:  Hysterectomy:  Salpingo-oopherectomy:  Endometriosis: |

**The Male Reproductive System**

The male has reproductive organs, or **genitals**, both inside and outside the pelvis. The male genitals include:

* the testicles
* the duct system, which is made up of the epididymis and the vas deferens
* the accessory glands, which include the seminal vesicles and prostate gland
* the penis

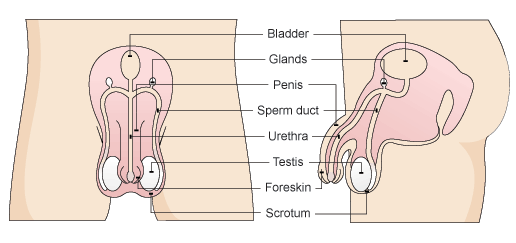
A man, who has reached sexual maturity, has two **testicles** or **testes** that produce and store millions of tiny sperm cells. The testicles are oval-shaped and grow to be about 2 inches (5 centimeters) in length and 1 inch (3 centimeters) in diameter. The testicles are also part of the endocrine system because they produce hormones, including **testosterone.** Testosterone is a major part of puberty in boys, and as a boy makes his way through puberty, his testicles produce increasing amounts. Testosterone is the hormone that causes boys to develop deeper voices, bigger muscles, and body and facial hair, and it also stimulates the production of sperm.

Alongside the testicles are the **epididymis** and the **vas deferens**, which make up the duct system of the male reproductive organs. The vas deferens is a muscular tube that passes upward alongside the testicles and transports the sperm-containing fluid called **semen**. The epididymis is a set of coiled tubes (one for each testicle) that connects to the vas deferens.

The epididymis and the testicles hang in a pouch-like structure outside the pelvis called the **scrotum**. This bag of skin helps to regulate the temperature of testicles, which need to be kept cooler than body temperature to produce sperm. The scrotum changes size to maintain the right temperature. When the body is cold, the scrotum shrinks and becomes tighter to hold in body heat. When it's warm, the scrotum becomes larger and more floppy to get rid of extra heat. This happens without the male ever having to think about it. The brain and the nervous system give the scrotum the cue to change size.

The **accessory glands**, including the seminal vesicles and the prostate gland, provide fluids that lubricate the duct system and nourish the sperm. The **seminal vesicles** are sac-like structures attached to the vas deferens to the side of the bladder. The **prostate gland**, which produces some of the parts of semen, surrounds the ejaculatory ducts at the base of the **urethra**, just below the bladder. The urethra is the channel that carries the semen to the outside of the body through the penis. The urethra is also part of the urinary system because it is also the channel through which urine passes as it leaves the bladder and exits the body.

The **penis** is actually made up of two parts: the **shaft** and the **glans**. The shaft is the main part of the penis and the glans is the tip (sometimes called the head). At the end of the glans is a small slit or opening, which is where semen and urine exit the body through the urethra. The inside of the penis is made of a spongy tissue that can expand and contract.

[Back](javascript:void(0))

[Listen](http://app.readspeaker.com/cgi-bin/rsent?customerid=5202&lang=en_us&voice=Kate&speed=100&readid=whichRead_5&url=http%3A//kidshealth.org/teen/sexual_health/guys/male_repro.html&mdid=5&audiofilename=KidsHealth_Male_Reproductive_System)

**Problems Affecting the Male Reproductive System (continued)**

**Disorders of the Penis**

Disorders affecting the penis include the following:

* **Inflammation of the penis.** Symptoms of penile inflammation include redness, itching, swelling, and pain. Balanitis occurs when the glans (the head of the penis) becomes inflamed. Posthitis is foreskin inflammation, which is usually due to a yeast or bacterial infection.
* **Hypospadius** is a disorder in which the urethra opens on the underside of the penis, not at the tip.

If you think you have symptoms of a problem with your reproductive system or if you have questions about your growth and development, talk to your parent or doctor — many problems with the male reproductive system can be treated.

Reviewed by: [Steven Dowshen, MD](http://kidshealth.org/parent/misc/reviewers.html)  
Date reviewed: October 2012

|  |
| --- |
| **How does age affect the quality of sperm?** |

**Medical Terminology**

**Section 1**

**Building words**

Medical terminology appears to be a subject that is difficult to comprehend and put into everyday practice. However by applying a few simple rules the meaning of medical terminology can be unlocked.

**Construction of medical terms**

Most medical terms can be broken down in 3 main components

|  |  |  |
| --- | --- | --- |
| **Prefix**  An element added to a word that can expand a medical meaning. | **Root**  Provide the core meaning of the medical term. | **Suffix**  An element added to the end of a root to expand its meaning |
| **For example**  **GASTRO**  Of the stomach | **ENTER**  Small intestine | **ITIS**  **Inflammation of ….** |

Deconstruction:

When you see a word you don’t know the best method of trying to work out its meaning is **DECONSTRUCTION.**

For example

Myocardial infarction:

**Myo** = muscle

**Cardial** = pertaining to the heart

**Infraction** = death of tissue due to loss of blood supply

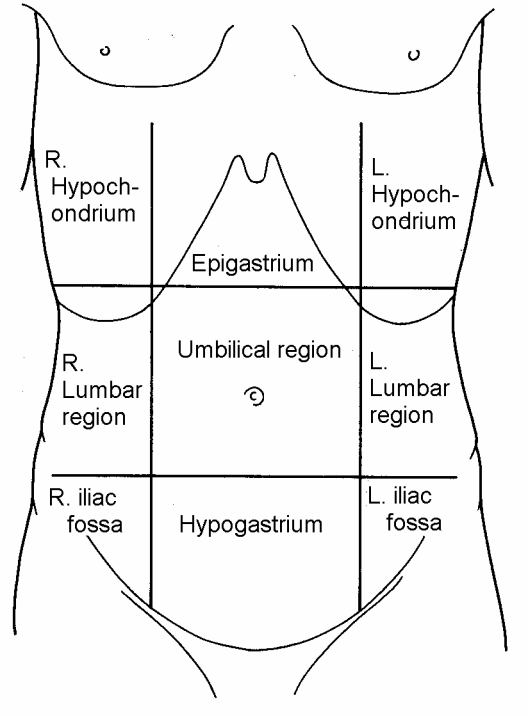
**Therefore Myocardial Infarction = death of heart muscle = Heart attack**

|  |
| --- |
| **Activity 1**  **Using deconstruction try and discover the meaning of these words (**use the dictionary at the back of the document**) :**  Endometriosis  Appendicectomy  Echocardiogram  Hepatomegaly    Encephalopathy  Radiology  Dermatology |
| Make a note of any words that you come across that you have found challenging. |

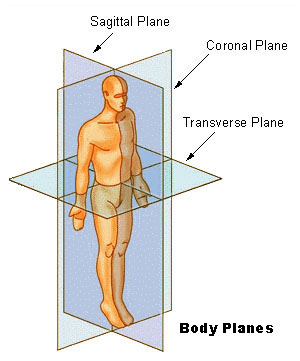
**Anatomical Positions**

Research and label the following diagrams:

Regions of the abdomen



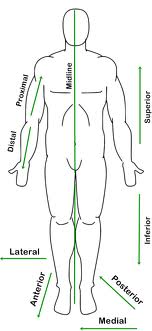
Anatomical Planes: **Link the words to the arrows**



Saggital Plane

Coronal Plane

Transverse Plane

****

Superior

Midline

Interior

Anterior

Medial

Lateral

Posterior

Distal

Proximal

**Medical terminology/Acronyms Glossary**

|  |  |  |
| --- | --- | --- |
| **Word** | **Meaning** | **Example** |
| SUFFIXES | | |
| …ectomy | Removal Of | *Colectormy* |
| …orrhaphy | Repair (suture) | *Herniorrhaphy* |
| …oscopy | Visual examination | *Endoscopy* |
| …otomy | Incision, cutting | *Osteotomy* |
| …ostomy | Forming an opening | *Colostomy* |
| ...pexy | Fixing (into place) | *Orchidopexy* |
| ...plasty | Surgical Repair | *Angioplasty* |
| ...gram | Tracing | *Echocardiogram* |
| …graphy | Picture(X-Ray) | *Radiography* |
| ...algia | Pain | *Neuralgia* |
| …itis | Inflammation of | *Tendonitis* |
| …megaly | Enlarged | *hepatomegaly* |
| ...ology | Study of | *Oncology* |
| …oma | Tumour (mass), swelling | *Neuroma* |
| …orrhoea | Flow, discharge | *Menorrhoea* |
| …orrhage | Bursting out | *Haemorrhage* |
| ...osis / iasis | Disorder, condition | *Sclerosis* |
| ...pathy | Disease | *Neuropathy* |
| …trophy | Nourishment, growth (size) | *Atrophy* |
| ***PREFIXES*** | | |
| An / A | Without/Lack of | ***A****pnoea* |
| Ante | Before | ***Ante****natal* |
| Post | After | ***Post*** *MI* |
| Brady | Slow | ***Brady****cardia* |
| Tachy | Fast | ***Tachy****cardic* |
| Hyper | Increased/Excess | ***Hyper****thyroidism* ***Hyper****natraemia* |
| Hypo | Decreased/Lack/Below | ***Hypo****kalaemia* ***Hypo****thyroidism* |
| Dys | Difficult/Disordered | ***Dys****menorrhoea*  ***Dys****plasia of the …* |
| Neo | New | ***Neo****plasm*  ***Neo****plasia* |
| Endo | Inside | ***Endo****scopy* |
| Peri | Around | ***Peri****carditis* |
| Intra | Within | ***Intra****dermal* |
| Olig | Few, small amount | ***Oligo****spermia* |
| Poly | Many | ***Poly****uria*  ***Poly****myalgia*  ***Poly****arthritis* |
| Py | Pus | ***Py****uria* |
| ***ORTHOPEADICS*** | | |
| Os / Oste | Bone | *Oste****oma*** |
| Arth | Joint | *Arthr****oma*** |
| Carp | Wrist | *Carpal Tunnel* |
| Dactyl | Toe | *Dactyl****itis*** |
| Phalanges | Finger | *Phalangectomy* |
| Ceph | Head | *Chephalgia* |
| Enceph | Brain | *Encephalopathy* |
| Cervic | Neck | *Cervical* |
| Dors | Back | *Dorsal Vertebrae* |
| Lumbar | Lower back | *L2* |
| Sacrum | Lower back | *Sacroiliac joint* |
| Spondyl | Vertebra | *Spondylosis* |
| Myel | Spinal cord (Marrow) | *Myelitis* |
| **Oste**omyel | Bone marrow | *Osteomyelitis* |
| Chondra | Cartilage | *Chondroma* |
| Teno | Tendon | *Tendinitis* |
| Hallux | Big Toe | *Hallux Valgus* |
| ...kinesia | Kinetic / Movement | *Dyskinesia* |
| ***Ear Nose and Throat*** | | |
| Aud | Hearing | *Audiology* |
| FB | Foreign Body |  |
| Gloss | Tongue | *Glossitis* |
| Laryng | larynx | *Laryngectomy* |
| Ot / Ot | Ear | *Otitis* |
| Or | Mouth | *Oral thrush* |
| Phonia | Speech | *Phonics* |
| ..phasia | Speaking | *Aphasia* |
| ..phagia | Swallowing | *Dysphagia* |
| TM | Tympanic Membrane |  |
| SMR | Submucosal Resection |  |
| Cyst | Cavity / Sac | *Aural cyst* |
| Ts and As | Tonsils & Adenoids |  |
| Naso | Nose | *Nasopharyngeal airway* |
| ENT | Ear, Nose, Throat |  |
| Tympan | Ear Drum | *Tympanogram* |
| Sinus | Cavity within bone | *Sinus Washout* |
| Myringo | Ear Drum | *Myringotomy* |
| Pharyng | Throat | *Pharyngitis* |
| Rhino | Nose | *Rhinoplasty* |
| Aur | Ear | *Auroscope* |
|  | | |
| Opthalm | Eye | *Opthalmology* |
| Respiratory | Lungs | *Respiratory Infection* |
| Pneumo | Air | *Pneumonia* |
| Broncho | Relating to the bronhcus | *Bronchoscopy* |
| Trache | Relating to the trachea | *Tracheaitis* |
| Pulmon | Relating to the lungs | *Pulmonary Fibrosis* |
| Arteri | Artery | *Arterial* |
| Angi | Vessel | *Angiography* |
| Oste | Bone | *Osteosarcoma* |
| Enceph | Brain | *Encephalitis* |
| Chondr | Cartilage | *Chondromalacia* |
|  |  |  |
| OA | Osteoarthritis |  |
| CXR | Chest X-Ray |  |
| Carp | Wrist |  |
| Phalanges | Finger bones |  |
| Ceph | Head |  |
| Phleb | Vein | *Phlebotomy* |
| Haem | Blood | *Heamatology* |
| aemia | Blood Condition | *Anaemia* |
| Cardi | Heart | *Cardiomyopathy* |
| Thromb | Blood Clot | *Thrombo-embolytic stockings* |
| Myo | Muscle | *Myositis* |
| Stenosis | Narrowing | *Atrial stenosis* |
| Sclerosis | Hardening | *Atherosclerosis* |
| Myocardial Infarction | Heart Attack |  |
| Splen | Spleen | *Splenomegaly* |
| Hepat | Liver | *Hepatomegaly* |
| Jaundice | Yellow colour |  |
| Cholecyst | Gall bladder | *Cholecsytectomy* |
| Peritoneum | Abdominal cavity lining |  |
| Colo | Realting to colon | *Colonoscopy* |
|  |  |  |
| FBC | Full Blood count. |  |
|  |  |  |
|  |  |  |
| Thrombocythaemia | increased platelets rare - bleeding |  |
| Thrombocytopenia | reduced platelets – bleeding |  |
| Leucocytosis | too many WBC’s infection / allergy / leukaemia |  |
| Leucopoenia | too few WBC’s |  |
| Polycythaemia | too many RBC’s |  |
| Anaemia | reduced RBC’s or decreased Hb per cell.  Iron deficient anaemia RBC size is small.  The normal haemoglobin levels in the blood are 12 to 16 g/dL in women and 13.5 to 18 g/ dL in men. |  |
|  |  |  |
| Renal | Of the Kidney |  |
| Nephro | Of the Kidney | *Nephritis* |
|  |  |  |
| glomerulo | Related to the glomerular | *Glomerular nephritis* |
| Cysto | To the bladder | *Cystososcopy* |
|  |  |  |
|  |  |  |
| Vag | Vagina | *Vaginal hysterectomy* |
| Anal |  | *Anal fissure* |
| Hyster | Uterus | *Hysterotomy* |
| Oophor | Ovary | *Oophorectormy* |
| Partum | Labour | *Post partum bleed* |
| Menses | Menstrual Bleed |  |
| Enuresis | Involuntary discharge of urine |  |
| Gravida | Relates to Pregnancy History |  |
| Salpingo | Fallopian tube | *Salpingo-oopherectory* |
| Orchido | Testes/testicles | *Orchidectomy* |
| Anterior / Ventral | Front or front surface of the body or structure. | *The sternum is anterior to the heart* |
| Inferior | The downward surface (lower). | *Inferior vena cava* |
| Superior | Upward surface (top). | *Superior vena cava* |
| Retrograde / Retroverted | Backwards / opposite to normal. |  |
| Lateral | Side or away from the midline (median plane). |  |
| Posterior | Back surface, or towards the back of the body. | *The spine is posterior to the heart.* |
| LIF | Left Illiac Fossa |  |
| RIF | Right Illiac Fossa |  |
| Distal | furthest from any reference point |  |
| Medial | nearest to the middle |  |
| Proximal | nearest to any reference point |  |
|  |  |  |
| BD (bis die) | Twice a day |  |
| OD (omne in die) | Once a day |  |
| prn (pro re nata) | As needed |  |
| m et n *(*marne et nocte) | Morning & night |  |
| QDS | Four times per day |  |
|  |  |  |
| TTA/TTOs |  |  |
| NSAID | Non-steroidal Anti-inflammatory Drug |  |
|  |  |  |
|  |  |  |

**Contacts**

If you require help with any aspect of this workbook please ask the course trainer or contact

Karen Davies

(Training and Development Co-ordinator –Wider Workforce)

Ext: 4426

Email: [karent.davies@gwh.nhs.uk](mailto:karent.davies@gwh.nhs.uk)

This workbook is the property of Bands 1-4 team, The Academy, Great Western Hospital, Swindon.

Reproduction can only be made with permission of the Wider Workforce team.