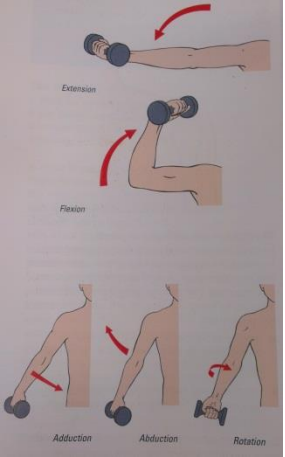


# Skeletal system

Long term effects of exercise	Joint movement	Injury (bone)	Injury (joint)	Diet
<p><b>FUNCTIONS OF THE SKELETON</b></p> <p><u>Joints for Movement</u> - where two or more bones meet form joints. Allow your skeleton to do lots of diffe</p> <p><u>Muscle attachment</u> – Provides a surface for muscles to attach to via tendons.</p> <p><u>Protection</u> – stops injury to vital organs</p> <p>Cranium – brain, Ribs – lungs</p> <p>This enables players to continue to play or train for their sport.</p> <p><u>Mineral storage:</u> Calcium and Phosphorus are stored within bones and are needed for strong teeth and bones. enables players to continue</p> <p><u>Blood cell production:</u> Red &amp; white blood cells and platelets are stored in the bone barrow these are needed for O2, fighting infections and clotting .</p>	<p><b>JOINTS OF THE BODY</b></p> <p><u>Hinge joint</u> – elbow and knee – flexion and extension</p> <p><u>Ball and socket joint</u> – shoulder – flexion, extension, abduction, adduction, rotation</p>	<p><b>FRACTURES</b></p> <p><u>CLOSED FRACTURE</u> – no skin is broken</p> <p><u>OPEN/ COMPOUND FRACTURE</u> – skin is broken</p> <p><u>SIMPLE FRACTURE</u> – break is in one line e.g greenstick fracture</p> <p><u>STRESS FRACTURE</u> – caused by overuse injuries. Muscles can be tired or when intensity has increased too much (going from grass court tennis to hard court), or wearing the wrong shoes. Most stress fractures are found in the lower leg</p>	<p><b>TENNIS AND GOLF ELBOW</b></p> <p>Overuse injuries to the tendons at the elbow joint</p> <p>Symptoms = PAIN</p> <p>Caused by holding the racket wrong</p> <p>Golfers elbow feel in on the inside of the elbow</p> <p>Tennis elbow is on the outside of the elbow.</p> <p><b>CONCUSSION</b></p> <p>A sudden but short lived loss of mental function that occurs after a blow or other injury to the head. Symptoms include: Headaches, dizziness, Nausea/vomiting, unconsciousness. Always seek medical attention.</p>	<p>The main micronutrient need to strengthen the skeletal system is <u>CALCIUM</u>.</p> <p>This will help you in your sport because it increases <u>bone density</u> and strengthens your bones.</p> <p>Less likely to get an <u>injury</u> when you go in for a tackle in rugby</p> <p>Too little calcium can cause <u>OSTEOPOROSIS</u></p>
<p><b>AFFECTS ON LIGAMENTS (bone to bone)</b></p> <p>Exercise <u>makes LIGAMENTS THICKER AND STRONGER</u>. This increases their flexibility and allows power in movement</p>			<p><b>DISLOCATION</b></p> <p>When a bones is forced out of its normal position</p> <p>Caused by hard blow or hit</p> <p>Symptoms = swelling, deformity, pain, possible fracture</p>	<p><b>VITAMIN D</b></p> <p>Essential to the growth and maintenance of healthy bones.</p> <p>Helps the body absorb calcium</p>
<p><b>WEIGHT BARING EXERCISE – increases bone density</b></p> <p>As you increase in age your bones become lighter and weaker.</p> <p>This can lead to <u>OSTEOPOROSIS</u> (bones look and break like a piece of aero chocolate)</p> <p>Osteoporosis can lead to <u>STRESS FRACTURES</u></p> <p>It is important to take part in weight baring exercises such as running, jumping, aerobics as this increases bone density and strengthens the bones</p>		<p><b>TREATMENT OF ALL SKELETAL INJURIES</b></p> <p><u>R.I.C.E</u></p> <p>REST – stop playing</p> <p>ICE – provides pain relief and reduces swelling by reducing blood flow</p> <p>COMPRESSION – reduces swelling</p> <p>ELEVATION – reduces swelling and reduces bloo9d flow to the area</p>	<p><b>SOFT TISSUE INJURIES</b></p> <p><u>Sprain</u> = damaged <u>LIGAMENT</u> ( twisted ankle)</p> <p>Normally happens in games that use a lot of agility (ankle/ knee) falling wrongly (wrist/ elbow)</p> <p><u>Torn cartilage</u> = ripping away of cartilage from the bone</p> <p>Caused by pivoting</p> <p>Symptoms = pain, swelling</p>	<p><b>SMOKING AND DRINKING</b></p> <p>Smoking and too much drinking can have a toxic effect on the bones</p>

## Muscular system

Immediate effects of exercise	Long term effects of exercise	Injury	Rest	Diet	Drugs
<p><b>INCREASE IN NEED FOR OXYGEN (Aerobic)</b>            Needed because more fuel need to cope with <u>increase in activity</u>            More carbon dioxide is made as a result</p>	<p><b>MUSCLE HYPERTROPHY</b>            muscles getting larger due to exercise – need to use progressive overload            Muscles fibres snap, <u>rest</u> is needed for those fibres to repair and get stronger.</p>	<p><b>MUSCULAR INJURY</b>            When you are injured you are unable to train. This causes <u>muscle atrophy</u> (Muscles getting smaller and therefor a reduction in strength)</p>	<p>Rest allows muscles to <u>repair the damage</u> caused by exercise and <u>get stronger</u></p>	<p><b>CARBOHYDRATES</b>            The muscular system need carbohydrates because to <u>provide energy</u> and top up the stores of glycogen in the liver and muscles. Find them in bread, pasta, potatoes</p>	<p><b>ANABOLIC STERIODS</b>            Increase <u>muscle size</u> and <u>strength quickly</u>  <u>Reduce recovery time</u> - means you can train harder and more often and <u>recover from injury quicker</u> which means you play again sooner</p>
<p><b>LACTIC ACID (anaerobic)</b>            Lactic acid builds up during <u>ANAEROBIC RESPIRATION</u> (without using oxygen) or when demand for oxygen is too high and the body cannot supply it.            This causes <u>cramp</u>            Need oxygen to break it down (<u>active cool down</u>)</p>	<p><b>BENEFITS OF HYPERTROPHY</b>            Muscle hypertrophy increase speed, power &amp; strength. Improves posture, stronger tendons. Improves bone density which makes bones stronger.  <b>MUSCLE ATROPHY</b>            Is the opposite – when you do not train the muscles get weaker and get smaller (link to reversibility and <u>injury</u>)</p>	<p><b>EXAMPLES OF INJURIES</b>  <u>STRAINS</u>, pulls, tears.            The fibres of the muscles can be torn from the tendons. Normally occurs when you haven't warmed up             To <u>prevent muscular injuries</u> you need to warm up and cool down effectively (why?)</p>	<p><b>LONG TERM REST</b>            You need long term rest because you need to be at peak performance for you event. E.g reducing the number of long runs before running a marathon</p>	<p><b>PROTEIN</b>            The body needs protein for <u>growth and repair</u>.             It helps to repair <b>damaged muscles</b> caused by exercise or injury.            Sports people who want to increase muscle size and strength need to eat a lot of protein e.g fish &amp; meat</p>	<p><b>USERS OF ANABOLIC STERIODS</b>            Any sports person that needs speed, strength and power e.g sprinter, weightlifter, Rugby players</p>
<p><b>MUSCLE FIBRE TYPES</b>            Type 1; Slow twitch (red) for longer endurance events            Type IIa – Fast twitch (pink) used for fast paced activities like the 400m and sustaining a powerful rally in tennis.            Type IIx – Super fast twitch (white) Used in activities like the 100m sprint or a serve in Tennis.</p>	<p><b>ANTAGONISTIC MUSCLES</b>            Muscles work together in pairs. One contracts while the other relaxes and are needed for all movement. Common pairs include:            Hanstrings/Quadriceps            Gluteals/Hip flexors            Triceps/Biceps            Pectorals/Trapezius            Gastrocnemius/Tibialis anterior</p>	<p><b>TREATMENT FOR MUSCULAR INJURIES</b>  <u>Rest</u> – stop  <u>Ice</u> – reduce pain and swelling  <u>Compression</u> - reduce pain and swelling  <u>Elevation</u> - reduce pain and swelling</p>	<p><b>EVERYDAY LIFE</b>            Having a strong muscular system helps you in everyday life by            Increasing work capacity            Decreasing chance of injury            Prevent lower back pain            Aid recovery after injury</p>		<p><b>OTHER DRUGS</b>            Stimulants (increase alert)            Beta Blockers (Lower HR)            Diuretics (Increase weight loss)            Narcotic Analgesics (pain killers)            Peptide hormones (increase red BC)            Growth hormone (Increase muscle mass)            Blood doping (Injecting O2 blood)</p>

# Cardiovascular system

Functions	Immediate effects of exercise	Long term effects of exercise		Negative effects on the cardiovascular system	
<p>The function of the cardiovascular system are</p> <p>To <u>supply the body with oxygen and nutrients</u> and</p> <p>To <u>remove waste such as carbon dioxide</u></p>	<p><b>Heart rate increase</b></p> <p>during exercise because the body needs more oxygen to create energy for the working muscles</p>	<p><b>Heart increases in size (hypertrophy)</b></p> <p>As the heart is a muscle as you train the <u>heart gets bigger and strong</u></p>	<p><b>Recovery rate decrease</b></p> <p>This is the speed at which your <u>working heart rate returns to normal</u>. The quicker this happens the fitter you are</p>	<p><b>Sedentary lifestyle</b></p> <p>If you don't exercise then you don't get benefits. This can lead to obesity if you eat the wrong things</p>	<p><b>Stress (not sport related)</b></p> <p>Increases the risk of cardiovascular disease. Stress can lead to high blood pressure</p>
<p><b>Blood pressure</b></p> <p>Is the force exerted by the blood on the walls of the arteries</p> <p><u>Systolic blood pressure</u> = maximum pressure in the arteries when the heart contracts</p> <p><u>Diastolic blood pressure</u> = maximum pressure in the arteries when the heart relaxes</p> <p><u>Average blood pressure</u> is 120/80</p>	<p><b>Body temperature increases</b></p> <p>When muscles work they generate heat</p>	<p><b>Stroke volume increases (SV)</b></p> <p>As the heart is bigger and stronger it can pump out <u>more blood per beat</u></p>	<p><b>Blood pressure decreases</b></p> <p>Exercise can lead to weight loss that leads to <u>blood pressure</u> decreasing</p>	<p><b>High Cholesterol</b></p> <p>There are 2 types of cholesterol</p> <p><u>HIGH DENSITY LIPOPROTEINS (HDL)</u> good fats. It carries cholesterol to the liver. Found in fruit, veg, whole grain</p> <p><u>LOW DENSITY LIPOPROTEINS (LDL)</u> bad fat. Causes build up in arteries. Found in fatty, fried foods</p>	<p><b>SMOKING</b></p> <p><u>Releases adrenaline</u> – causes heart to beat faster</p> <p><u>Lowers good cholesterol</u> – causes blockages, <u>Raises blood pressure</u>, strokes, heart attacks</p> <p>Can <u>cause diseases</u> such as Bronchitis, emphysema, cancer</p>
	<p><b>Sweating starts</b></p> <p>This is to help the body cool down. Sweat on the skin evaporates. <u>Salt and water</u> can also be lost during sweating so needs to be replaced during and after exercise</p>	<p><b>Resting heart rate (HR) decreases</b></p> <p>As the heart can pump out more blood per beat it means the <u>heart can supply the same amount of blood in fewer beats</u></p>	<p><b>Healthier veins and arteries</b></p> <p>Fitness <u>increases the number of capillaries in the heart</u>. It also makes <u>arteries more flexible and clear</u>. The clearer the arteries the lower the blood pressure</p>		
<p><u>Aerobic respiration</u></p> <p>Using oxygen and glucose to produce energy</p> <p><u>Anerobic respiration</u></p> <p>When the demand for oxygen is too high and the body can't supply enough oxygen to make energy, the body has to use stored glycogen to produce energy. This produces <u>lactic acid</u></p>	<p><b>Blood pressure increases</b> It increases during exercise because more blood is being pumped around the body</p>	<p><b>Cardiac output increase (CO)</b></p> <p><math>CO = SV \times HR</math></p> <p><u>The amount of blood pumped out of the heart per minute</u>. As the heart is bigger and stronger SV goes up which means CO increases</p>	<p><b>DIET AND THE CV SYSTEM</b></p> <p><u>Foods high in iron</u> are important as iron is used in the blood to transport oxygen.</p> <p>Lack of iron in the blood is called <u>anaemia</u></p> <p>Iron rich foods are red meat and green vegetables</p>	<p><b>Coronary heart disease</b></p> <p>Is the <u>narrowing of coronary artery caused by deposits of fat and cholesterol</u> on the inside of the arteries. This increase blood pressure and can lead to heart attacks and strokes</p> <p><u>Exercise reduces the risk of CHD</u></p>	<p><b>Rest</b></p> <p>Rest is needed for recovery and allows the heart <u>to grow in size</u></p>

# Respiratory system

Key words	Immediate effects of exercise	Long term effects of exercise		Diet	Drugs - smoking
		Rest			
<p><b>LUNG CAPACITY</b> The amount of air your lungs can hold</p>	<p><b>BREATHING QUICKENS AND DEEPENS</b> This is to <u>increase the amount of oxygen brought into the lungs and carbon dioxide taken out of the lungs (gaseous exchange)</u></p>	<p><b>INCREASED NUMBER OF AVEOLI</b> This allows more oxygen to be absorbed into the blood and can deal with a higher production of carbon dioxide</p>	<p><b>LUNG CAPACITY INCREASES</b> The size of your lungs get bigger so you can take in more air per breathe</p>		<p><b>DAMAGES ALVEOLI</b> Alveoli break down and become less stretchy. This makes them less efficient at diffusing oxygen in to the blood vessels. So it is more difficult to get oxygen in and carbon dioxide to get out  This causes shortness of breathe</p>
<p><b>TIDAL VOLUME</b> The amount of air you can breathe in and breathe out in one go of a normal breath (think of the tide going in and out)</p>	<p><b>OXYGEN DEBT OCCURS AFTER EXERCISE</b>  Oxygen debt is the extra oxygen you breath in during recovery (compared to the amount of air you would breath in during rest)  This happens during <u>ANAEROBIC RESPIRATION</u></p>	<p><b>NUMBER OF BLOOD VESSELS AROUND AVEOLI INCREASE</b>  This means more oxygen can diffuse in to the blood and to the muscles creating energy quicker</p>	<p><b>VITAL CAPACITY INCREASES</b> The maximum amount of air you can breathe in gets bigger</p>		<p><b>INCREASES BLOOD PRESSURE</b>  Because less oxygen gets into the blood per breathe the heart has to work harder to get enough oxygen to the working muscles</p>
<p><b>VITAL CAPACITY</b> The <b>maximum</b> amount of air you can breathe in and then breath out .</p>	<p>To repay the oxygen debt you breathing still needs to be higher than at rest.</p>	<p><b>THIS MAKES THE BODY MORE EFFICIENT AT GETTING OXYGEN IN AND CARBON DIOXIDE OUT</b></p>			<p><b>CAUSES DISEASES SUCH AS</b>  Bronchitis – excess mucus in the bronchus  Emphysema - destroys alveoli  Lung cancer  Lung disease</p>