Element 1.2 Understand basic anatomy and physiology

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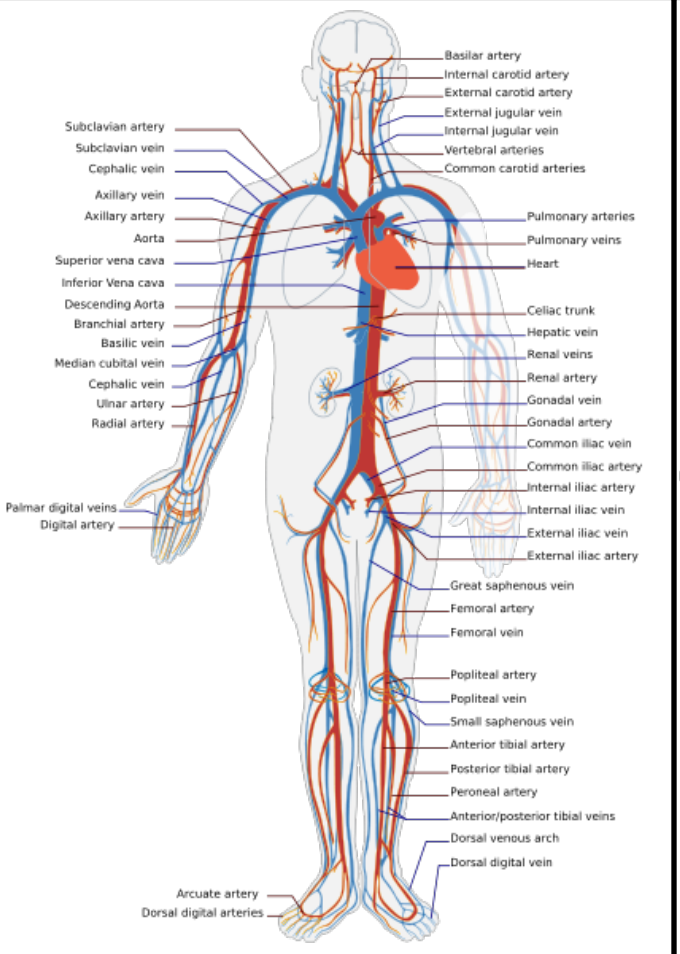
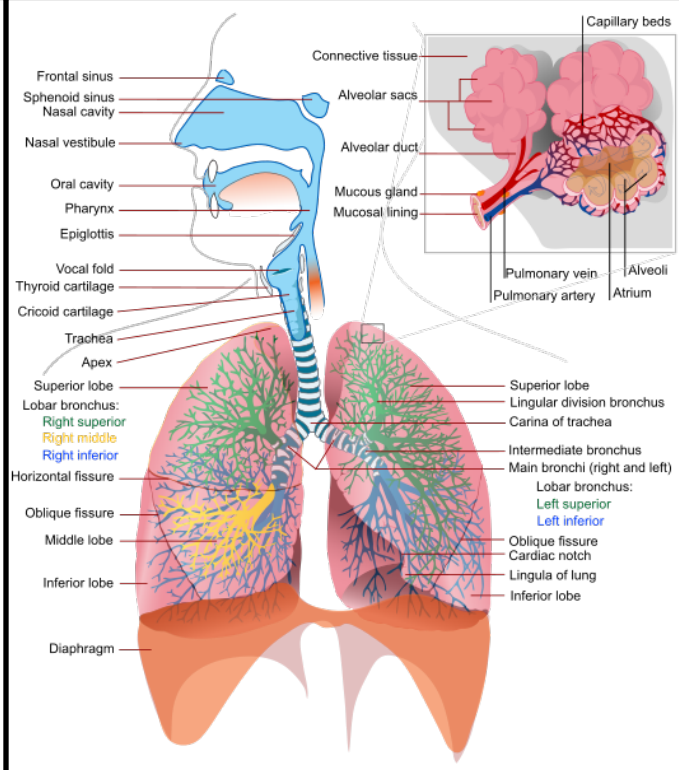
The human body is made up of several major organ systems, 3 of these systems that are import to exercise and nutrition are:

Circulatory system



[1]

Respiratory system



[2]

Musculoskeletal system

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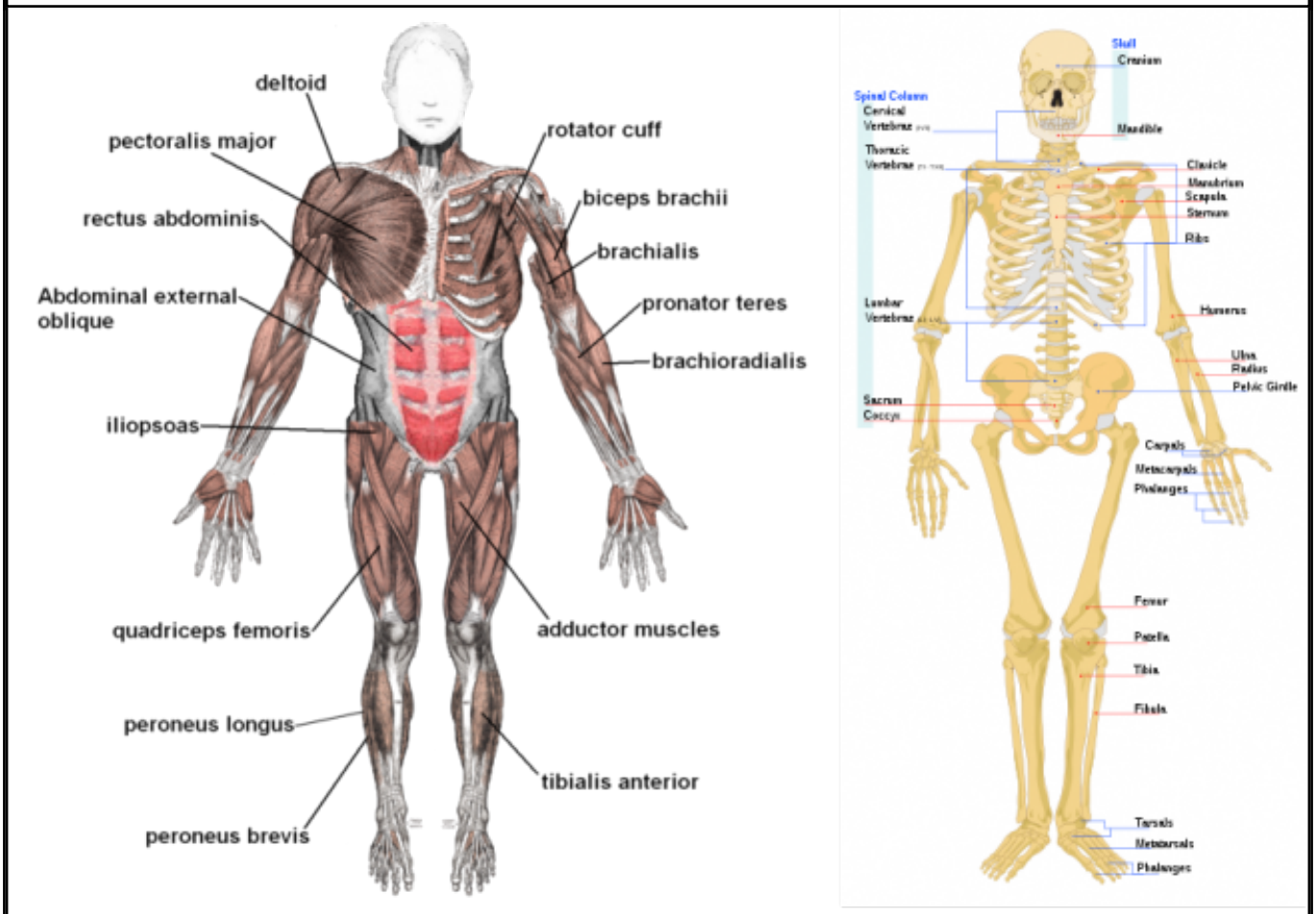
Musculoskeletal system



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Musculoskeletal system

The Skeletal system gives the human body its shape, it protects our major organ like the heart and lungs being protected by our rib cage and our brain being protected by our skull. Muscles are connected to the bones in our skeleton by tendons. Muscles connected to our skeleton via tendons enable us to move.

Circulatory System

The Circulatory system is a system of organs which acts as a blood distribution network around the body. The 3 main organs in the circulatory system are heart, lungs and blood vessels

Respiratory system

The respiratory system enables us to breathe, its function is to absorb oxygen and output carbon dioxide. Oxygen is absorbed by red blood cells and then pumped around the body by the heart.

Energy Systems

There are 2 types of energy system aerobic and anaerobic. Aerobic means with oxygen and anaerobic means without oxygen. Aerobic activity refers to using oxygen in the bodies energy generating process. Aerobic exercise refers to exercise which improves the efficiency of this process. Aerobic exercise is exercise in which your body burn carbohydrates and fats after an $_{initial}$ period of using the body's instant energy glycogen to produce glucose. This $_{initial}$ stage is anaerobic exercise and is a short burst of intensive activity.

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Examples of aerobic exercise: long distance running, long distance cycling, squash,

Examples of anaerobic exercise: weightlifting, 100 metres sprint, shot putt,

Principals of training

There are lots of different ways to train. Mostly it depends what you are training for and the level you are starting at. Someone who is training for a weightlifting competition will train very differently to someone who is training to do a marathon. There are some simple principals which can be applied to any sort of training.

Frequency - How often you train

Recovery - The period of rest between both training sets and training sessions

Duration - How long to train for

Intensity - How hard you train

Variety - Which different exercises you use and how often you change them

Overload - Increasing the demand to force bodily adaptation

Specificity - Focusing on a particular area or muscle group for your desired training goal

Isolation - Restricting movement to one joint to isolate one muscle eg dumbbell curl isolates the biceps.

Reversibility - Losing the benefits from training if you stop for long periods of time.

Components of Fitness

As mentioned previously different training techniques suit different people depending on what they are training for. An athlete may need to focus on several components of fitness in order to achieve their goal.

The components of fitness are: cardio-respiratory endurance, muscular strength, muscular endurance, flexibility and body composition
flexibility and body composition

I become European junior power lifting champion when I was 20. Power lifting focus's on strength for very short periods of time. The main aim of the competition is to lift as much weight as you can for 1 repetition over 3 exercises: Squat, Bench press and Dead lift. Lifters are grouped in weight classes (a bit like boxers) the over all winner is the lifter who lifts the most compared to his/her own body weight. When training for competitions the following components of fitness were the ones I focused on: **Muscular strength** this is quite an obvious one and the majority of my training was to improve my strength. **Flexibility** this is not so obvious but some of the lifts require good technique as well as strength to lift the most weight possible, you need a certain about of flexibility in order to lift with good technique. **Body composition** is also very important, as mentioned before your lifting the maximum you can compared to your body weight. If your carrying any excess fat or weight that is not used for lifting weights then its costing you points. The best way to win a weightlifting competition is to use good technique and be a strong and as lean as possible.

Since retiring from weightlifting due to an injury caused by a car accident I have taken up running 10k cross country runs and 1/2 marathons. The training for running is very different from the training for weightlifting competitions. I now mainly train for **cardio-respiratory endurance** to keep up a decent pace for just just over 3/4 of an hour for 10k and over an 1 hour and a half for a 1/2 marathon. It is still important to keep up **flexibility** and stretch before running and after running so

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as to avoid injury. I have also been working on **muscular endurance** to improve the ability to sprint at the end of a race. I also want to keep up my body composition and keep my weight down, extra **muscular endurance training** with weights has assisted with this. I have found keeping my weight down reduces the pressure on my joints when running and helps me run faster times. The reduced weight helps with aches and pains due to the impact of running on hard surfaces like tarmac and concrete.

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[2] http://upload.wikimedia.org/wikipedia/commons/5/5e/Respiratory_system_complete_en.svg
[3] http://en.wikipedia.org/wiki/Musculoskeletal_system
[4] http://theingots.org/community/node/14013

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