

Musculoskeletal system

Humerus - The top of the arm

Radius- lower arm

Ulna- Lower arm

Tendons attach muscles to bones.

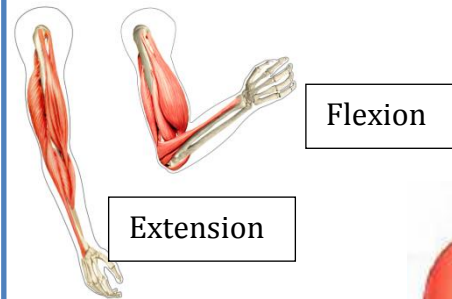
Antagonistic muscle pairs

Bicep- Contracts when the arm flexes (flexion). Relaxes when the arm extends.

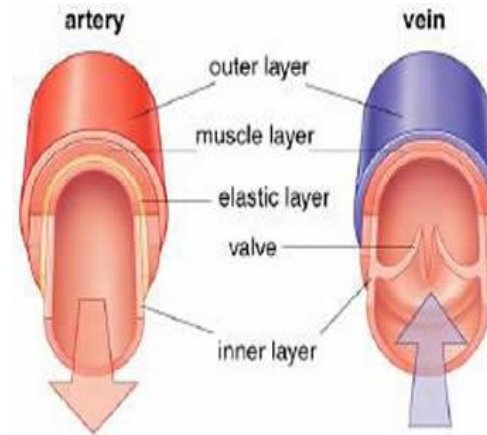
Triceps Contracts when the arm extends (extension). Relaxes when the arm flexes.

When a muscle contracts it pulls on a tendon which pulls on a muscle causing it to move.

Anatomy and Physiology Year 9 Football Higher HS



How can you link these to doing a throw in?



Cardiovascular system

Heart

Blood vessels

- **Arteries** - Carry **OXYGENATED** blood **away** from the heart
- **Veins** - Carry **DEOXYGENATED** blood **in** to the heart

Cardiac Output = Stroke volume x Heart rate

Cardiac Output- The volume of blood pumped out of the heart in 1 minute

Stroke Volume - The volume of blood pumped out of the heart per beat

Heart Rate - How many times the heart beats per minute.

When you play football your cardiac output increases due to the increased demand for oxygen by your working muscles.

Respiratory system

Gaseous exchange

Oxygen is breathed in through the mouth.

It then enters the lungs and the chest cavity becomes larger.

Oxygen is then diffused into the blood and transported to working muscles that need it during a game of football such as the biceps and triceps.

Carbon dioxide is created by the working muscles and is a waste product. Carbon dioxide is transported by the blood back to the lungs and is breathed out.

Mechanics of breathing

Inhalation:

Intercostal muscles contract, lifting the rib cage up and out

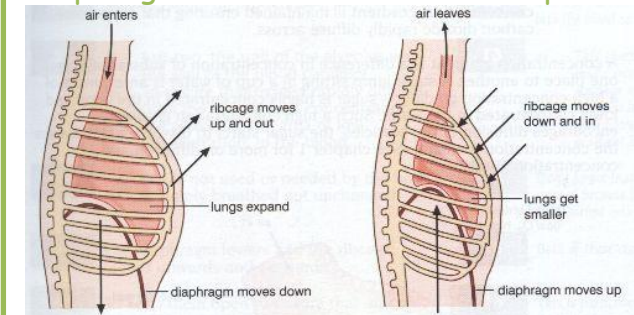
Diaphragm contracts into a flattened shape

Exhalation:

Intercostal muscles relax.

Rib cage moves inwards and downwards.

Diaphragm relaxes into a dome shape



Aerobic - Exercise whilst using oxygen (e.g. jogging for long periods of time)

Anaerobic - Exercise without using oxygen (short, fast movements such as tackling an opponent or sprinting past an opponent. Lasts a few seconds)

Short term effects of exercise (what happens straight away)

Increased heart rate

Increased stroke volume & cardiac output

Increased breathing rate

Increased body temperature

Long term effects of exercise

Remember the 4 S's (increased strength, speed, stamina & suppleness)

Lower resting heart rate

Increased size of heart

Increased lung capacity

Body shape may change

Synovial Joints

Hinge joint: Elbow + Knee

Ball and socket joint: Shoulder and Hip

Components of a synovial joint:

Ligaments: attach bone to bone

Cartilage: covers ends of bone, providing a smooth, friction-free surface

Synovial fluid: lubricates a joint

Synovial membrane: produces synovial fluid which lubricates a joint

The **hinge joint** at the **elbow** allows **flexion and extension**. When performing a pass **extension** occurs at the **elbow** caused by the **triceps contracting** and the **biceps relaxing**.

LINK EVERYTHING BACK TO YOUR SPORT!!

