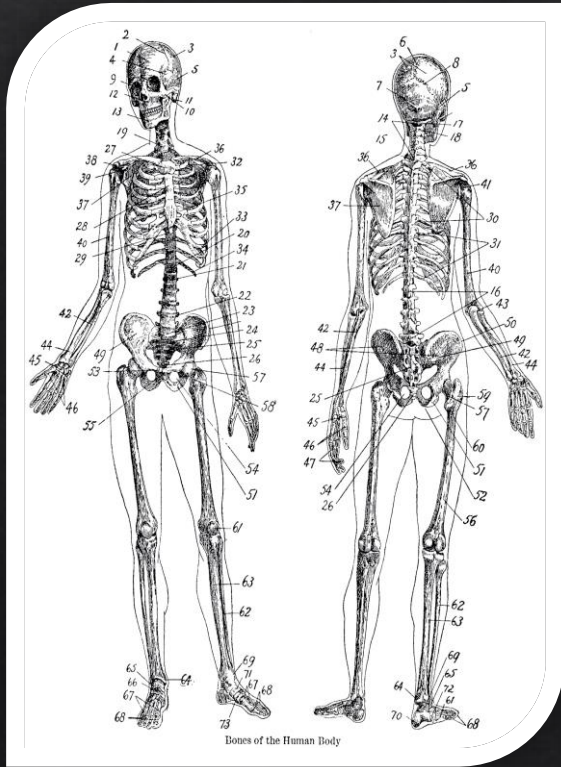


English Tutorial Classes

Week 1



Basic Human Anatomy/Physiology

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The Body in Sports

The human body is a very complex living "machine," and **anatomy (anatomija)** is the study of its different parts and how they are built.

By learning how the body is put together, we can better understand how it reacts to exercise and training.



Cells - THE Building Blocks of Life

Human cells (ljudske ćelije) are the basic building blocks of the body. The body is made up of millions of these small, living cells. Together, they form our **skin (koža)**, **bones (kosti)**, **muscles (mišići)**, **brain (mozak)**, and other body parts.

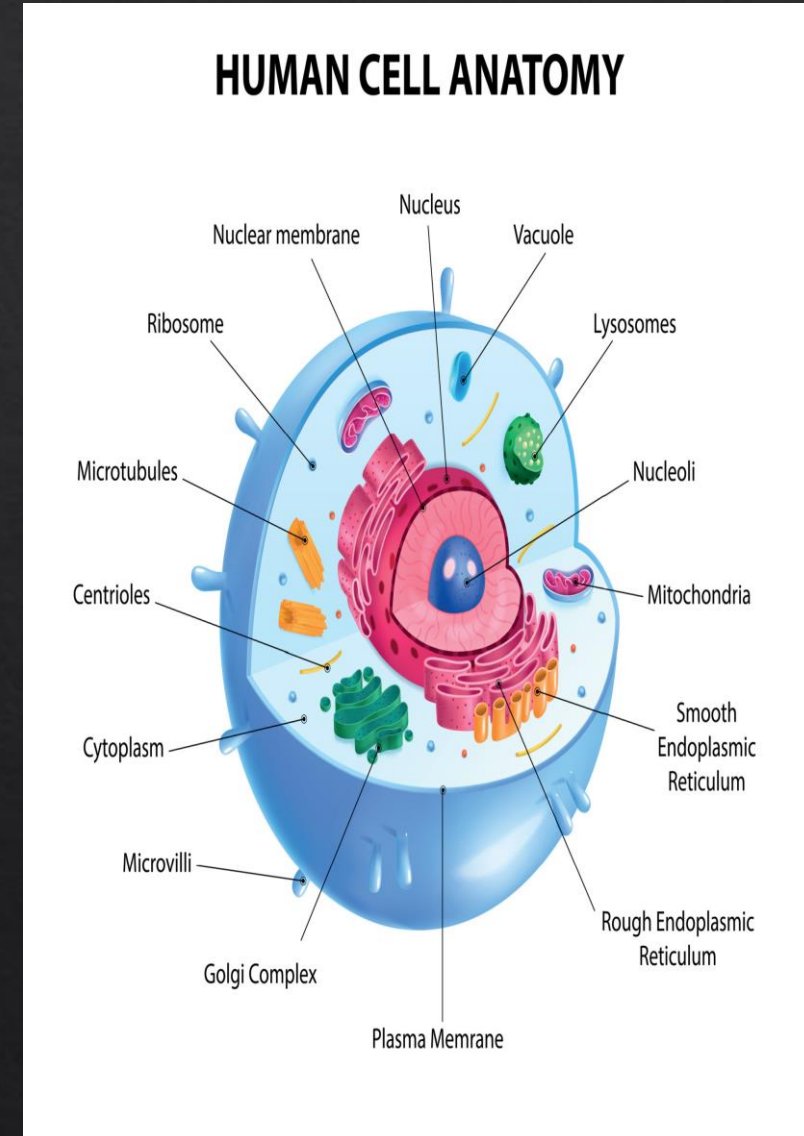
Types of cells:

Nerve cells (nervne ćelije) send electrical messages.

Red blood cells (crvena krvna zrnca) carry oxygen through the body.

Bone cells (ćelije kostiju) help build and support our bones.

Muscle cells (mišićne ćelije) help us move by making force.



The Skeleton

Humans (ljudi), like many big animals, have a **skeleton (kostur)** inside their bodies. The skeleton is made of bones and other parts that help support the body.

The skeleton has three main jobs:

Support (potpora) – it holds up the body.

Protection (zaštita) – it keeps important organs safe, like the brain (mozak) and heart (srce).

Movement (pokret) – it works with muscles to help us move.

The Skeleton

The human skeleton has over two hundred bones.

Bones are classified into five main categories:

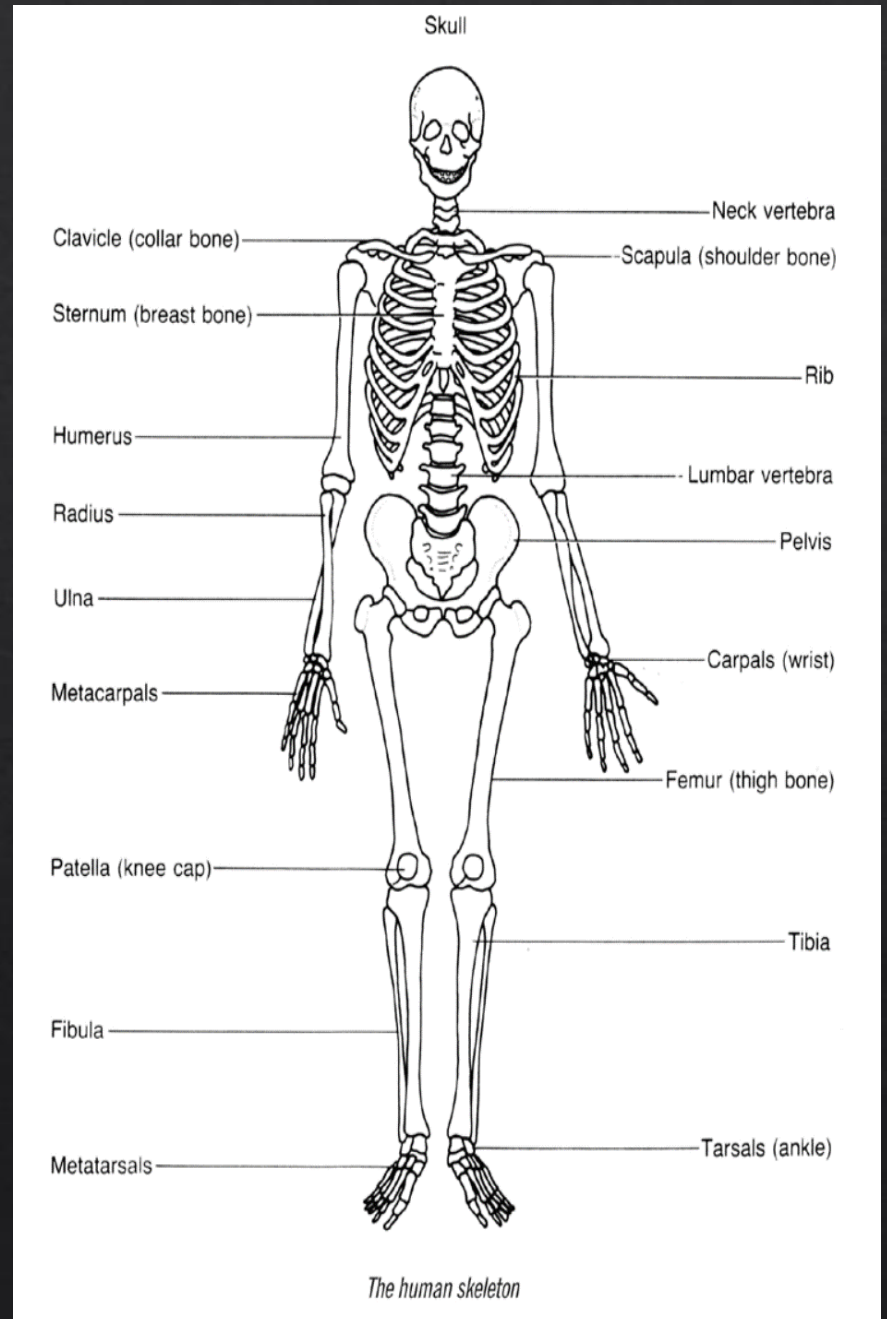
Long - femur (butna kost), humerus (nadlaktična kost)

Short - tarsal bones of the foot (članci stopala), carpals (zapeščajne kosti)

Flat - frontal bone of the skull (čeona kost lobanje), scapula (lopatica), sternum (grudna kost)

Irregular - vertebrae (pršljenovi)

Sesamoid - kneecap (čušica)

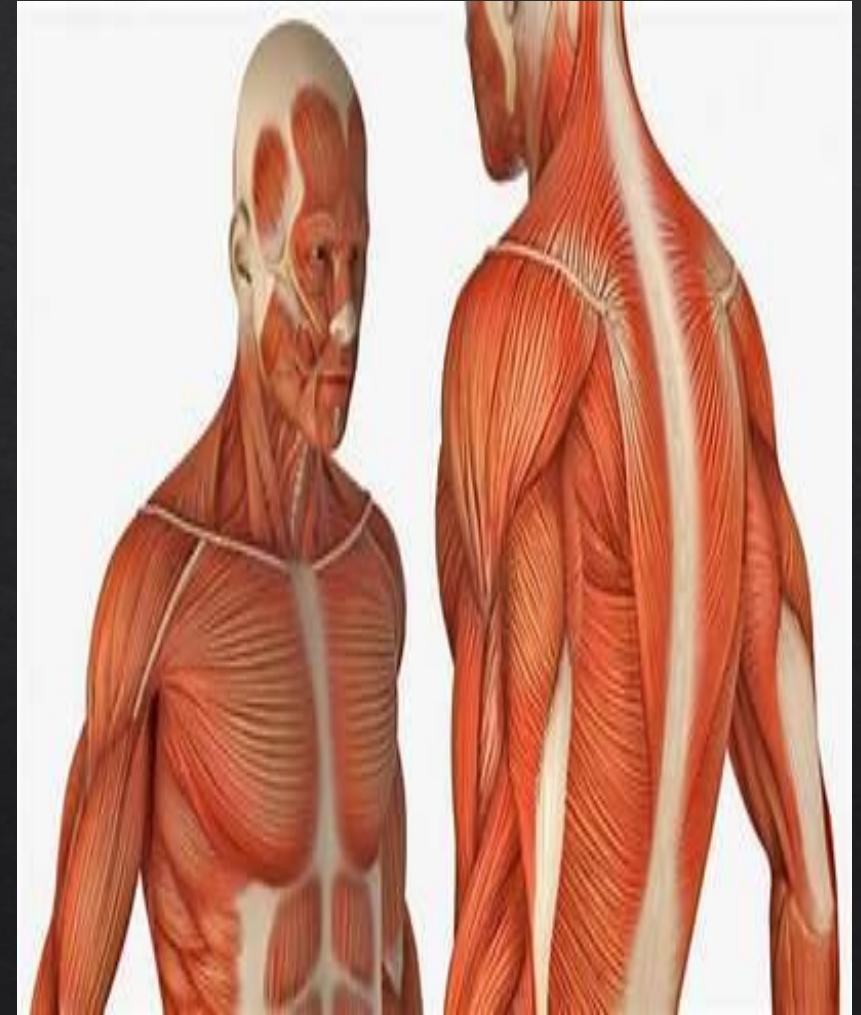


Muscles

The human body has over 600 muscles, which make up about 40% of **body weight (telesne mase)**.

Bones move at the **joints (zglobovi)** because muscles pull on them by tightening (**contracting – stezanjem**) and loosening (**relaxing – opuščanjem**).

Muscles are made of **muscle fibers (mišična vlakna)**.



FACIAL MUSCLES (mišići lica) - these muscles are involved in facial expressions

PECTORAL MUSCLE (prsni mišić) - brings arm to side and across chest

THORAX (grudni koš) - links the ribs, contracts and relax in respiration

ABDOMEN (stomak/trbušni region)—protects abdominal organs

FLEXORS (pregibači) – bends wrist and fingers

ADDUCTORS (aduktori) - thighs (unutrašnji mišići butine)

RECTUS FEMORIS (pravni butni mišić) - bends hip joint and strengthens knee

SARTORIUS (krojački mišić) – bends knee and hip joints

SKELETAL MUSCLES (skeletni mišići):

1. BICEPS

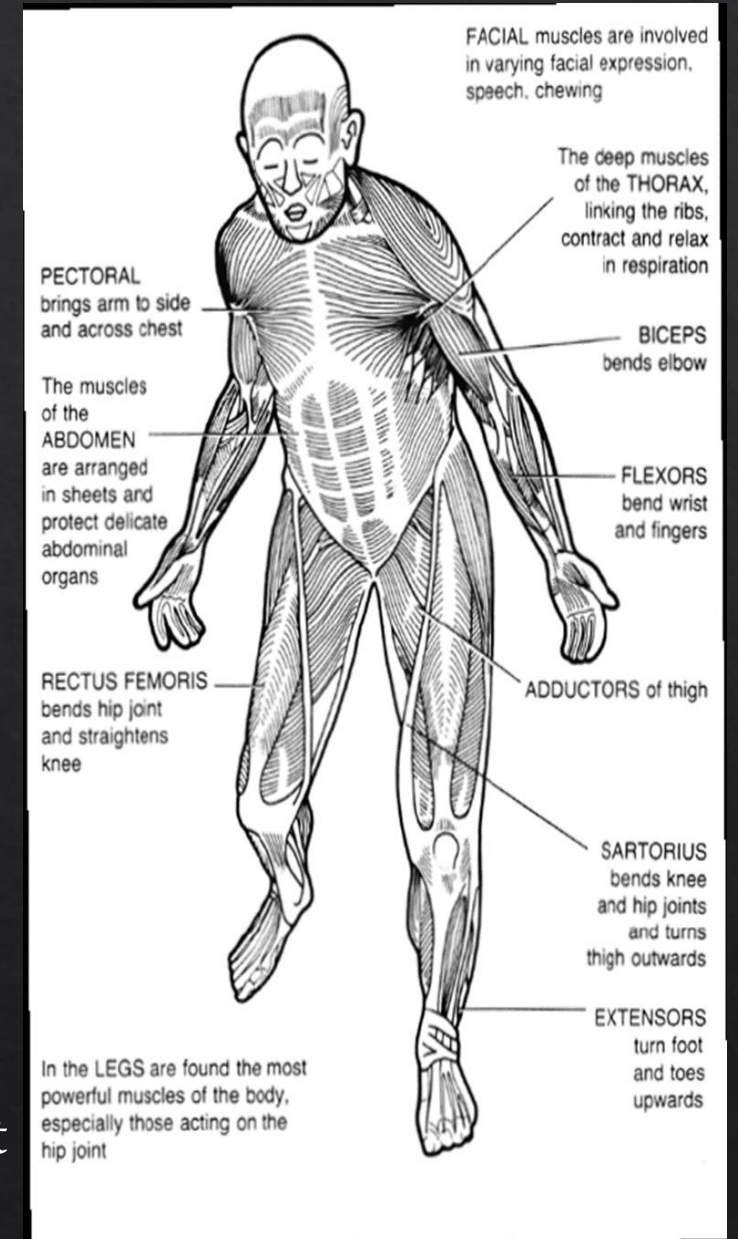
Function: Flexes the elbow joint, supinates the forearm (rotates it palm up), and assists in shoulder flexion.

2. TRICEPS

Function: Extends the elbow joint, allowing for straightening of the arm.

3. HAMSTRINGS (zadnja loža butine)

Function: Group of muscles on the back of the thigh that flex the knee joint and extend the hip joint.



EXTENSORS (ispružači) – straightens the wrist and fingers

TRICEPS- straightens elbow

DELTOID (deltoidni mišić) - raises arm

TRAPEZIUS (trapezni mišić) – raises shoulder and pulls back head

LATISSIMUS DORSI (široki leđni mišić) - draws arm backwards and turns it inwards

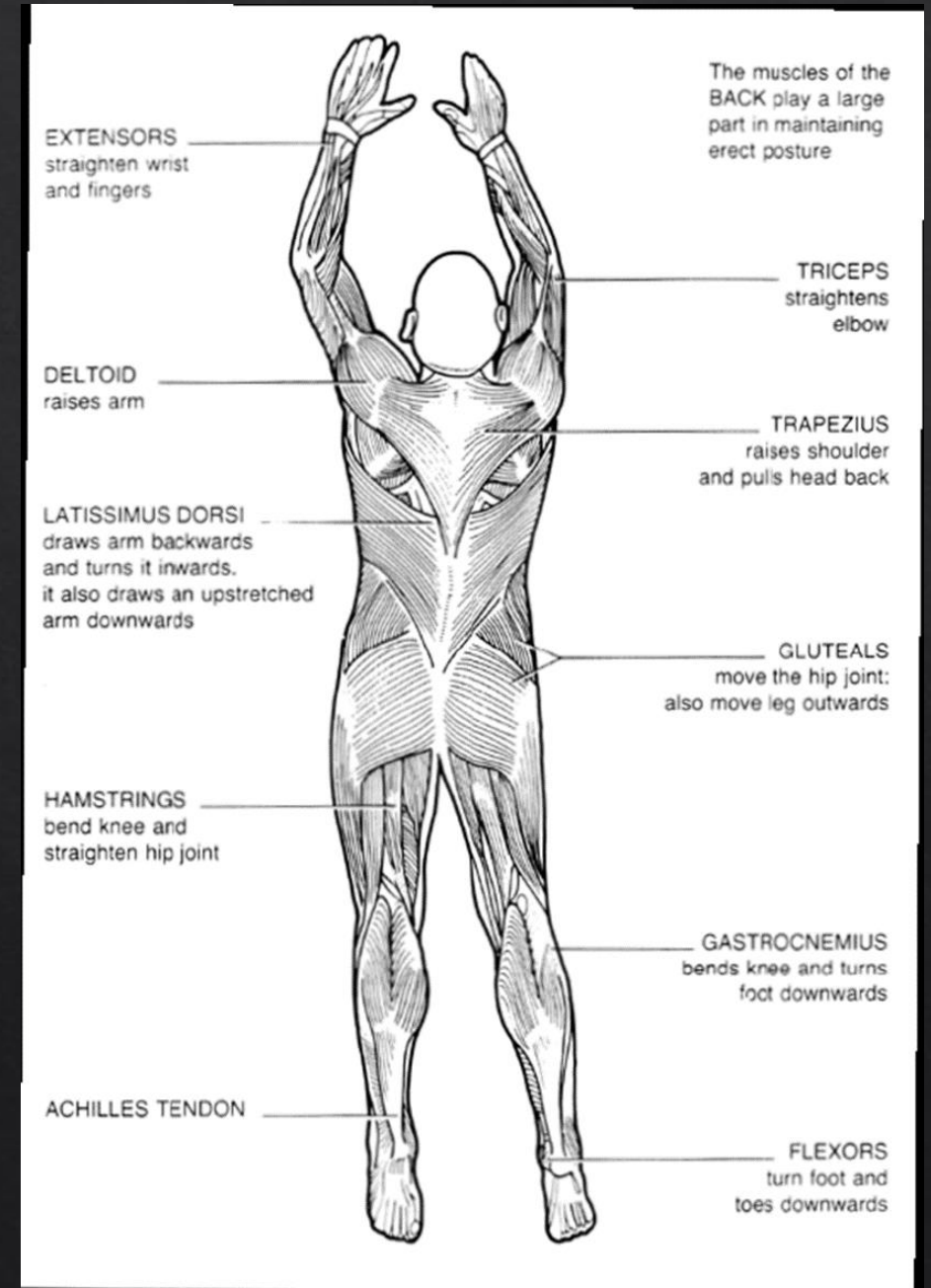
GLUTEALS (gluteusi) - moves the hip joint; move the leg outwards

HAMSTRINGS (zadnja loža butine) - bends knee and straighten hip joint

GASTROCNEMIUS (listni mišić) - bends knee and turns foot downwards

ACHILLES TENDON (Ahilova tetiva)

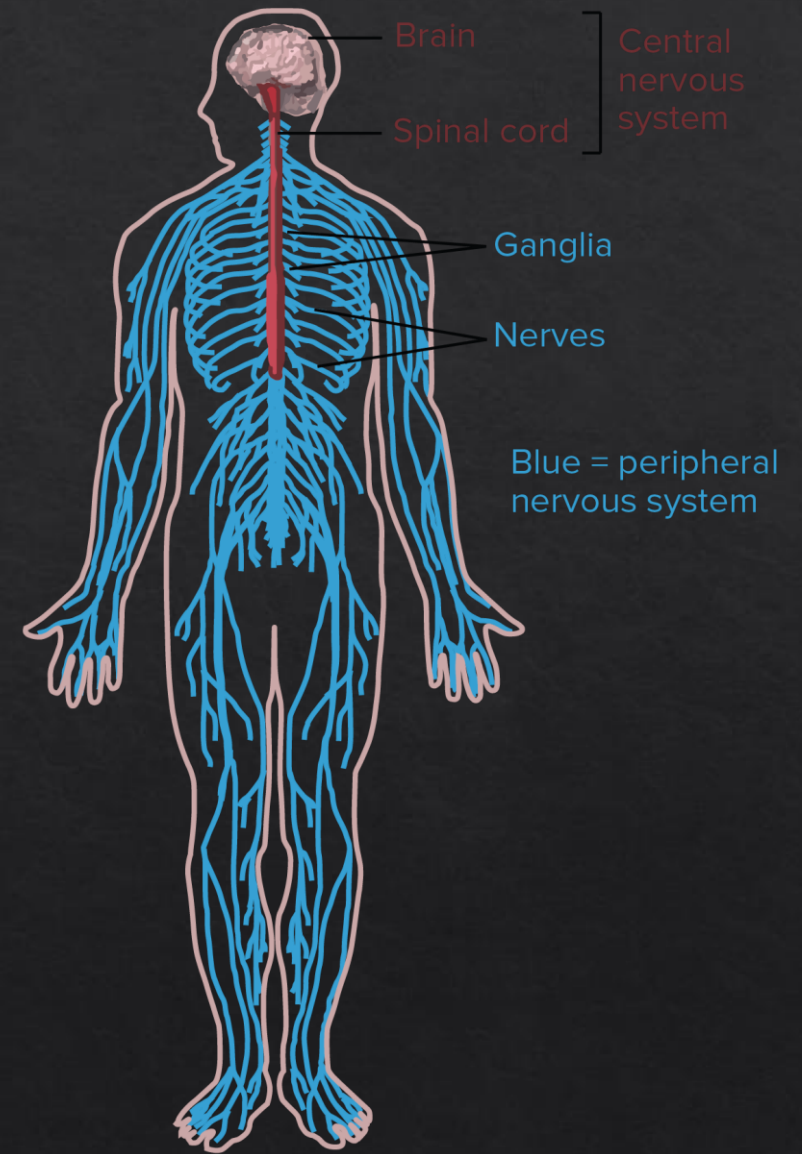
FLEXORS (pregibači) - turns foot and toes downwards



The Nervous System

The nervous system includes **the brain, spinal cord (kičmena moždina)**, and many **nerves (nervi)** that spread out to different parts of the body.

Muscles start to move when they get a message from the brain. This message is called a **nervous impulse (nervni impuls)**, and it's like an **electrical signal (električni signal)** sent by nerve cells.



The Cardio-Respiratory System

The cardiorespiratory system (kardiorespiratorni sistem), also called the **cardiovascular system (kardiovaskularni sistem)**, brings **oxygen (kiseonik)** to the body's cells and takes away **waste (otpadne materije)**.

It includes the heart, **blood vessels (krvni sudovi)** – **arteries (arterije)**, **veins (vene)**, **capillaries (kapilari)**, and **blood (krv)**.

Arteries carry oxygen-rich blood away from the heart to the rest of the body.

Veins carry blood back to the heart after it has given away its oxygen.

Capillaries are tiny blood vessels that connect arteries and veins.

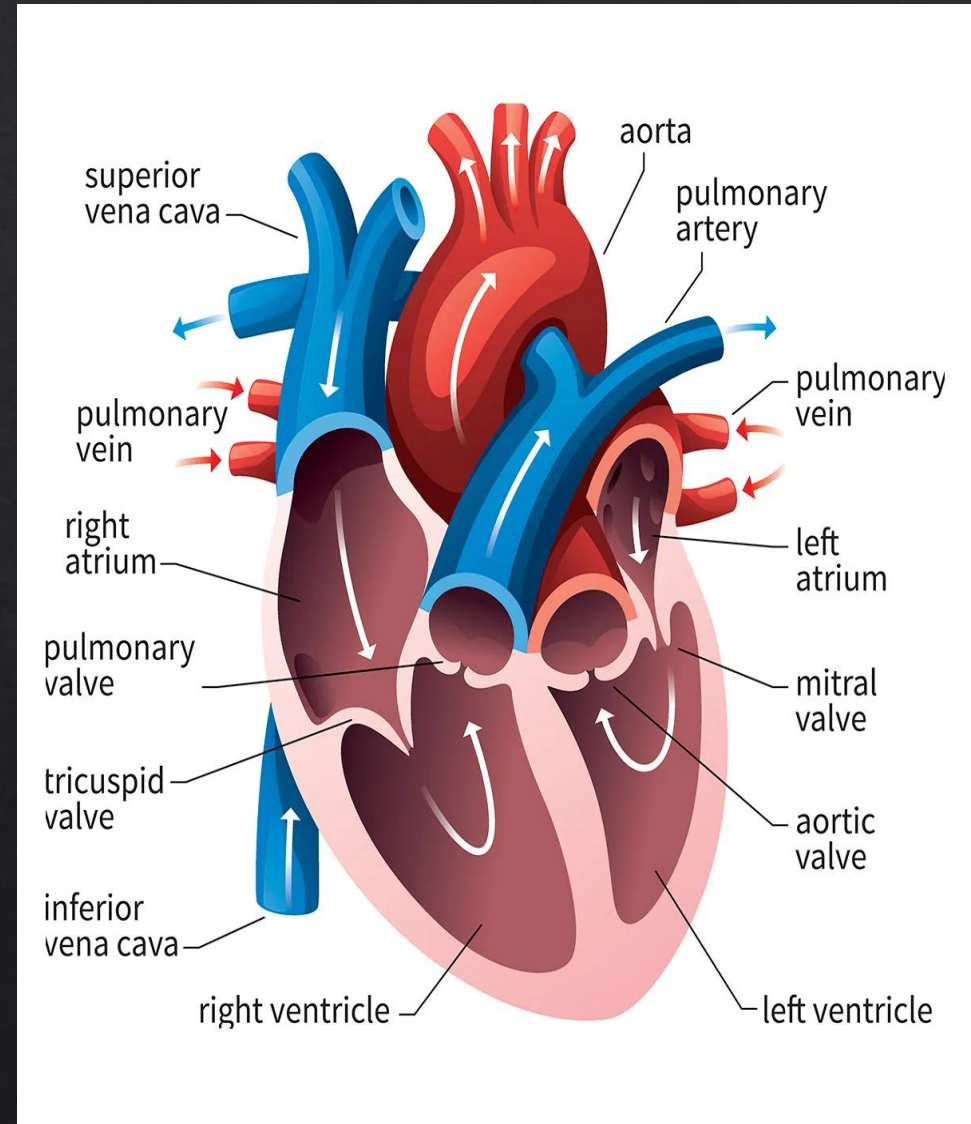


The Heart

The heart is like a powerful **pump (pumpa)** in your **chest (grudi)** that helps circulate blood throughout your body. Every muscular contraction of the heart is called **A HEARTBEAT (otkucaj srca)**.

When you exercise, your muscles need more oxygen to work efficiently. To meet this demand, your heart beats faster to pump more blood and deliver more oxygen to your muscles.

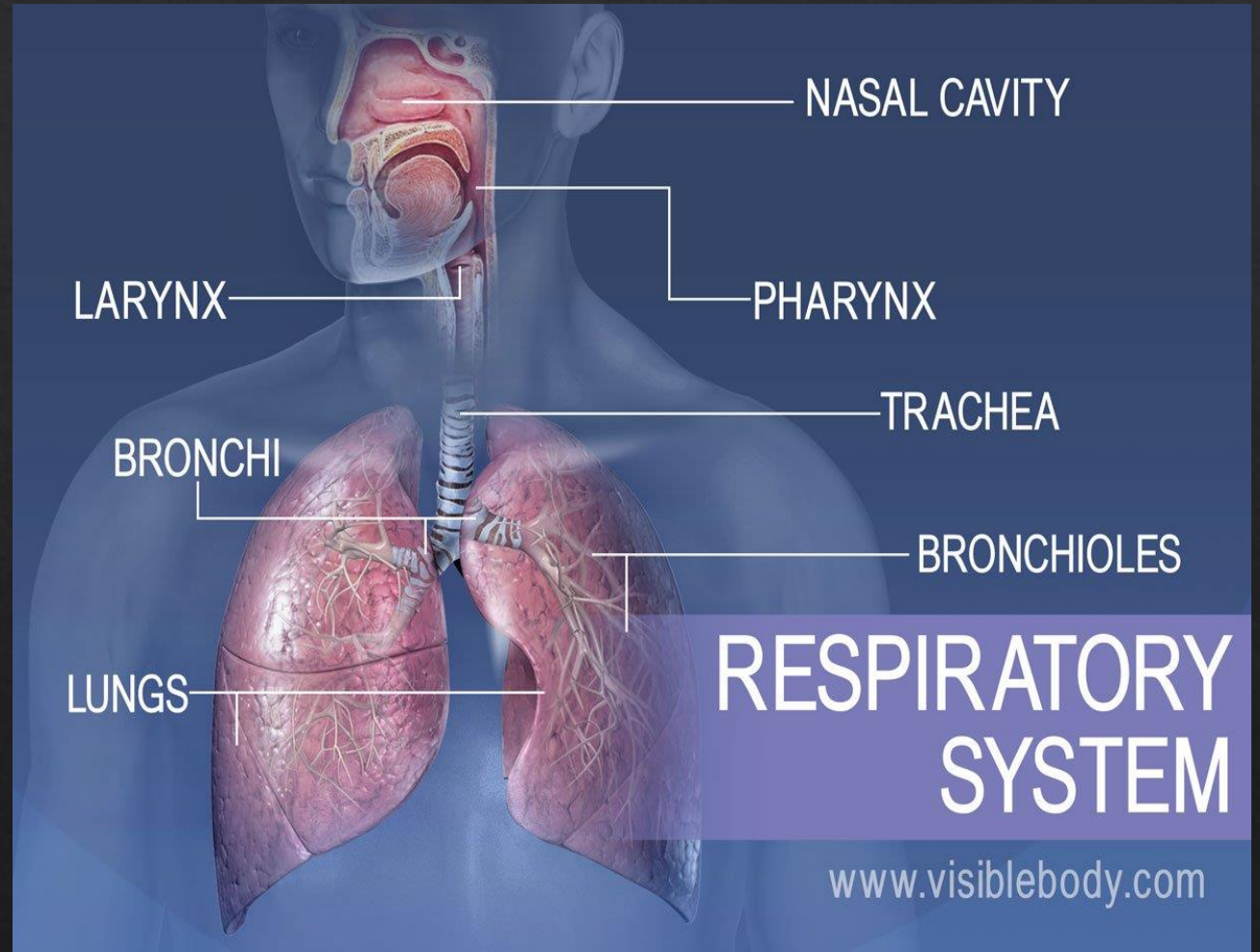
This heart rate can be best felt in **THE PULSE (puls)** at the **WRIST (zglob šake)** or side of the **NECK (vrat)**.



The Respiratory System

It includes the **lungs (pluća)** and **air passages (disajni putevi – trachea (dušnik), bronchi (bronhije).**

The take in oxygen from the air and remove carbon dioxide (ugljen-dioksid) when we breathe out.



The Lungs

When the body is resting, we breathe in about 10 liters of air each minute. But during **hard exercise (intenzivno vežbanje)**, we need a lot more air, so the breathing rate can go up to 120–150 liters per minute.

It's also important to know that the nose can only take in about 50 liters of air per minute, so during intense exercise, we usually need to breathe through the mouth too.



Exercise Physiology

Exercise physiology (fiziologija vežbanja) is the study of how the body reacts and changes when we do physical activity or exercise.

It looks at how different body systems—like the heart and blood, lungs, muscles, and metabolism—work and work together during exercise.

A good **coach (trener)** also knows that every person's body is different and may react to exercise in its own way.



Thank you for your attention!