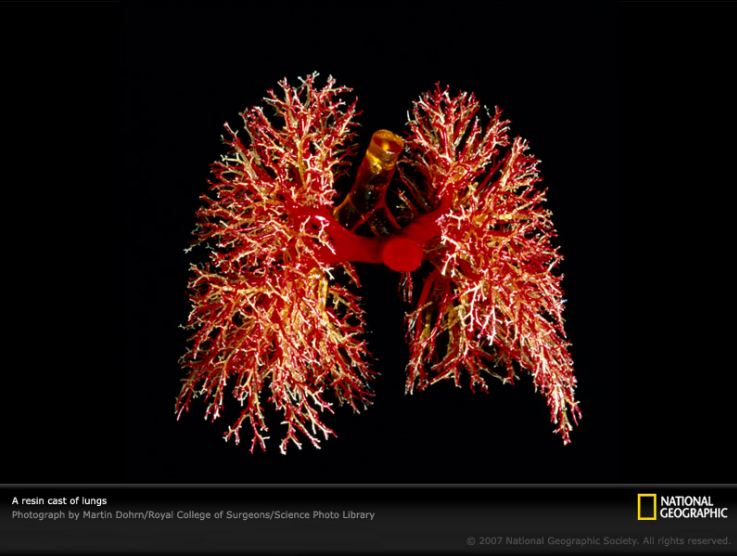


passion integrity enthusiasm fun honesty professionalism



Cardio Respiratory System



Park Centre CYQ
Level 2 Fitness Instructing

Cardio Respiratory system

What you need to know:

- Anatomy of the heart
- The cardiac cycle
- Stroke volume and cardiac output
- Functions and characteristics of arteries, veins, capillaries
- Functions of pulmonary and systemic circulation
- Pathway of inhaled air through respiratory system
- Normal inspiration and expiration
- Respiratory muscles involved in breathing

Overview

- Pulmonary – circulation of the lungs
- Systemic – circulation around the body

The Heart

Has Four Chambers

- Two Atria – Left Atrium and Right Atrium
- Two Ventricles – Left Ventricle and Right Ventricle
- Atria receive blood and Ventricles pump blood out

The Heart – Comings and Goings

- Right Atrium – receives blood from the body via the Superior and Inferior Vena Cava
- Right Ventricle – pumps blood to the lungs via Pulmonary Artery
- Left Atrium – receives blood from the lungs via the Pulmonary Veins
- Left Ventricle – pumps blood to the body via Aorta

Cardiac Cycle

- Systole or systolic phase – contracting phase, blood pumped out of heart into arteries
- Diastole or diastolic phase – relaxing phase, blood is received from the veins
- What is a 'normal' blood pressure reading?
- What is a 'healthy' resting Heart Rate?
- Stroke Volume is the amount of blood pumped out per beat by the heart
- Cardiac Output – the amount of blood pumped out by the heart in one minute

Vascular System

Blood Vessels and Heart

- Arteries carry blood away from the heart: Arteries have thick muscular walls, smooth muscle tissue, elastic connective tissue
- Veins carry blood back to the heart: Veins have thin muscular walls, smooth muscle tissue, valves to prevent back flow – Venous return
- Capillaries (smaller vessels) carry blood from arterioles to venules. Capillary walls are one cell thick to allow transfer of oxygen and materials – diffusion
- Pulmonary Artery – de oxygenated blood from heart to lungs
- Pulmonary Vein – oxygenated blood from lungs to heart

Respiratory System

- Respiratory system is responsible for movement of air in and out of lungs
- Air contains approx – 78% nitrogen, 21% oxygen, 1% carbon dioxide. Also water vapour, dust pollen, germs, poisonous gases and pollutants
- Inspiration – breathing in. Oxygen enters the nose/mouth, then past the pharynx and larynx, into trachea (wind pipe), into left and right bronchus, then bronchioles and alveoli
- Expiration - breathing out. Carbon dioxide goes in opposite direction

Passage of Air .. begins ..

- From the nose, across the pharynx into the trachea (windpipe)
- Trachea splits into two bronchi (left and right bronchus), these divide like branches of a tree into bronchioles
- At the end of bronchioles sit alveoli (like little bunches of grapes), alveoli collect oxygen and pass it into the bloodstream

Passage of Air .. cont ...

- Oxygen carried in blood to heart via Pulmonary Vein
- Then pumped around the body via arteries to working organs/muscles/cells. Arteries split off (like tributaries of a river) into tiny capillaries where oxygen can pass into muscles.
- Muscles use up oxygen, and give off carbon dioxide, this is passed from the muscles into the blood via capillaries

Passage of Air .. concluded ..

- Carbon dioxide is carried back to the heart via veins
- From the heart it is pumped to the lungs via Pulmonary Arteries
- Alveoli collect up Carbon dioxide and pass it into the bronchioles, back to the trachea to be breathed out

Recap

- Can you
- Describe the passage by which air travels to the lungs?
- Describe gaseous exchange? Pulmonary diffusion and Tissue diffusion
- Name the four chambers of the heart and their functions, and name the vessels that come into/go from the chambers?
- Describe the cardiac cycle?
- Name the main characteristics of arteries/veins?