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## **Exercise physiology**

**Q1) Write a paragraph on the short term Exercise and long term Exercise on cardiovascular system?**

**Ans) Short Term Exercise:** Many short term effects take place during physical activities including;

1. Faster heart rate contractions this leads to an increased heart rate and increased circulation which gets oxygenated blood to muscle quicker.
2. More forceful heart contractions with each heartbeat which leads to a greater amount of blood being pumped throughout the body.
3. Blood is diverted from soft organs to working muscles.
4. More blood circulated around the body.
5. Increase in breathing rate.

**Long Term exercise:**

1. **Lower resting heart rate:** This enables us to do more each day and to carry out longer and harder exercise.
2. **Stroke volume increase:** volumes of blood that is pumped out of the heart per beat. This will enable more oxygen to be used by our working muscles and organs.
3. **Size of heart increases:** It's called hypertrophy this will make our heart healthier and ward off the onset of heart diseases.
4. **Increase in red blood cell**
5. **Increased capillarisation.**

**Q2) During exercise which hormones are involved and how they respond to exercise?**

**Ans)** When we exercise our body releases chemicals called endorphins. These endorphins interact with receptors in our brain that reduce our perception of pain. Endorphins also trigger a positive feeling in the body similar to that of morphins.

**Epinephrine & Norepinephrine:** These amine hormones play an important role in helping the sympathetic nerve system (SNS) produce energy and in regulating the body's function during cardiorespiratory exercise.

- **Stimulate for releases:** Epinephrine Moderate to intense exercise, stress, hypertension and Norepinephrine moderate to intense Exercise hypoglycemia.
- **Target Tissues:** Epinephrine (Skeletal muscles)  
Norepinephrine (Adipose tissues liver).
- **Response:** Epinephrine (Glycogenolysis) breakdown of glycogen, Vasoconstriction.  
Norepinephrine (lipolysis) breakdown of fat.

**Growth Hormones:** During exercise the pituitary gland releases Human growth hormones which tells the body to increase bones, muscle, and tissues production when you start exercise the thyroid gland sends out hormones that regulate the body's temperature, heart rate, and Bp.

- **Response:** Stimulation of growth, FFA mobilization
  - Glycogenesis
  - Glucose uptake.

**Cortisol:** It is a catabolic steroids hormone produced by the adrenal gland in response to stress, low blood sugar, and exercise. It supports energy metabolism during long periods of exercise by facilitating the breakdown of triglycerides and protein to create the glucose necessary to help fuel exercise.

- **Stimulating for release:** -ACTH intense
  - Prolong exercise
- **Target Tissues:**
  - Skeletal muscles
  - Adipose tissues, liver
- **Response:** - Gluconeogenesis
  - Protein synthesis
  - Glucose uptake.

### **Testosterone:**

Testosterone is a steroid hormone produced by the Leydig cells of the testes in males and the ovaries of females, with small amounts produced by the adrenal glands of both genders. Testosterone is responsible for muscle protein resynthesis and the repair of muscle proteins damaged by exercise, and plays a significant role in helping grow skeletal muscle. Testosterone works with specific receptor sites and is produced in response to exercise that damages muscle proteins.

- **Response:** Protein synthesis, sperm production, Sex drive.