Joint analysis / CV system – Regulation of HR

Summer Homework – Year 12

- Do a joint analysis of:
- Swimmers left ankle
- Cyclists left elbow
- Footballers left shoulder

Joint analysis

- What areas?
1. Type of joint
2. Art. Surfaces
3. Type of Movement
4. Agonist (Antagonist)
5. Contraction
6. Fibre type?
7. Planes of movement
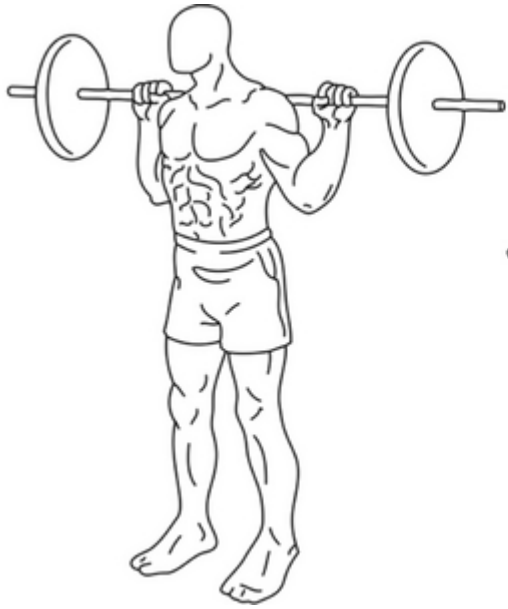8. Nerve stimulation

Joint analysis

- Footballer – Right Knee
- Cyclist – Left Hip
- Swimmer – Right elbow
- Runner in blue at front– Right ankle
- Type of Joint
- Art. Surfaces
- Type of Movement
- Agonist (Antagonist)
- Fibre type?
- Plane of movement

Contraction

Contraction

Contraction

Heart rate regulation 'during' exercise

- 3 different factors why your HR increases in first minutes of exercise?
- Control of HR
- Adrenalin (**Hormonal**) – AR?
- **Neural** – 3 a. More movement / b. More chemicals in body / c. More 'pressure'
- Proprioreceptors detect increase in movement / Chemoreceptors detect increase in / baroreceptors detect an increase in blood pressure
- **Intrinsic** – Body temperature increases, venous return will then increase / myocardial stretch / SV and CO will increase with HR

Heart rate / Stroke Volume / Cardiac Output

- Def / Values – **Rest** /Sub-maximal/**Maximal / Formulas?**

Cardio-vascular

Definition and units	Rest Untrained	Rest Trained	Maximal
HR			
SV			
CO			

Heart definitions

- HEART RATE – the number of (ventricle) contractions in one minute (at rest = 72bpm)

- STROKE VOLUME- volume of blood ejected from the ventricles in <u>one</u> contraction (at rest = 70 ml) – think rower – one stroke

- Cardiac Output – (Q) volume of blood ejected from the ventricles in one minute (at rest = 5Litres) – Formula?

- Q = HR X SV

- How do values change for 'trained' athletes and Why?

- Bradycardia?

- – RHR below 60 BPM

- Best methods to calculate HR?

- Carotid and radial pulse / heart rate monitors

Exercise 8

Heart rate

- Untrained /   Trained
- Rest
- 70-72bpm /   50-60 bpm
- Sub-max
- 100-130bpm   /   95-120bpm
- Max
- 220-age   /   220-age   - Danger?

Stroke Volume

- Untrained /   Trained
- Rest
- 70ml   /   100ml   increase EDV
- Sub-max
- 100-120ml /   160-200ml   Reason?
- Max
- 100-120ml /   160-200ml   Reason?
- Time / fill of chambers / diastolic phase / peaks

Cardiac Output

- Untrained   /   Trained
- Rest
- 5L/min   /   5L/min
- Sub-max
- 10-15L/min   /   15-20L/Min
- Max
- 20-25 L/min   /   30-40 - mark?

HR response

- Graph
- Plot a HR graph for 20 min run for an Elite 20 year old endurance runner - AI