TEL PE Revision

Revision Series 2022

OCR A-Level Physical Education

Exercise Physiology

• Notes pages •

The EverLearner

Welcome to the 2022 Revision Series for OCR A-Level Physical Education! We hope you find it useful. Before we start, please make sure you have all of the documents below, as they will be great help for your revision:

- Notes pages
- Practice questions
- Mark schemes
- Model answers
- Infographics
- Revision timetable

You will find all these documents on our OCR A-Level PE Revision page (https://pages.theeverlearner.com/2022-ocr-a-level-pe-revision).

Ergogenic aids

Ergogenic Aids
Pharmacological Aid: Anabolic Steroid

- Synthetic hormone
- Testosterone

Positive

- Increased protein synthesis
- Increased muscle growth
- Increased muscle mass
- Improved recovery
- Increased intensity and duration of activity

Negative

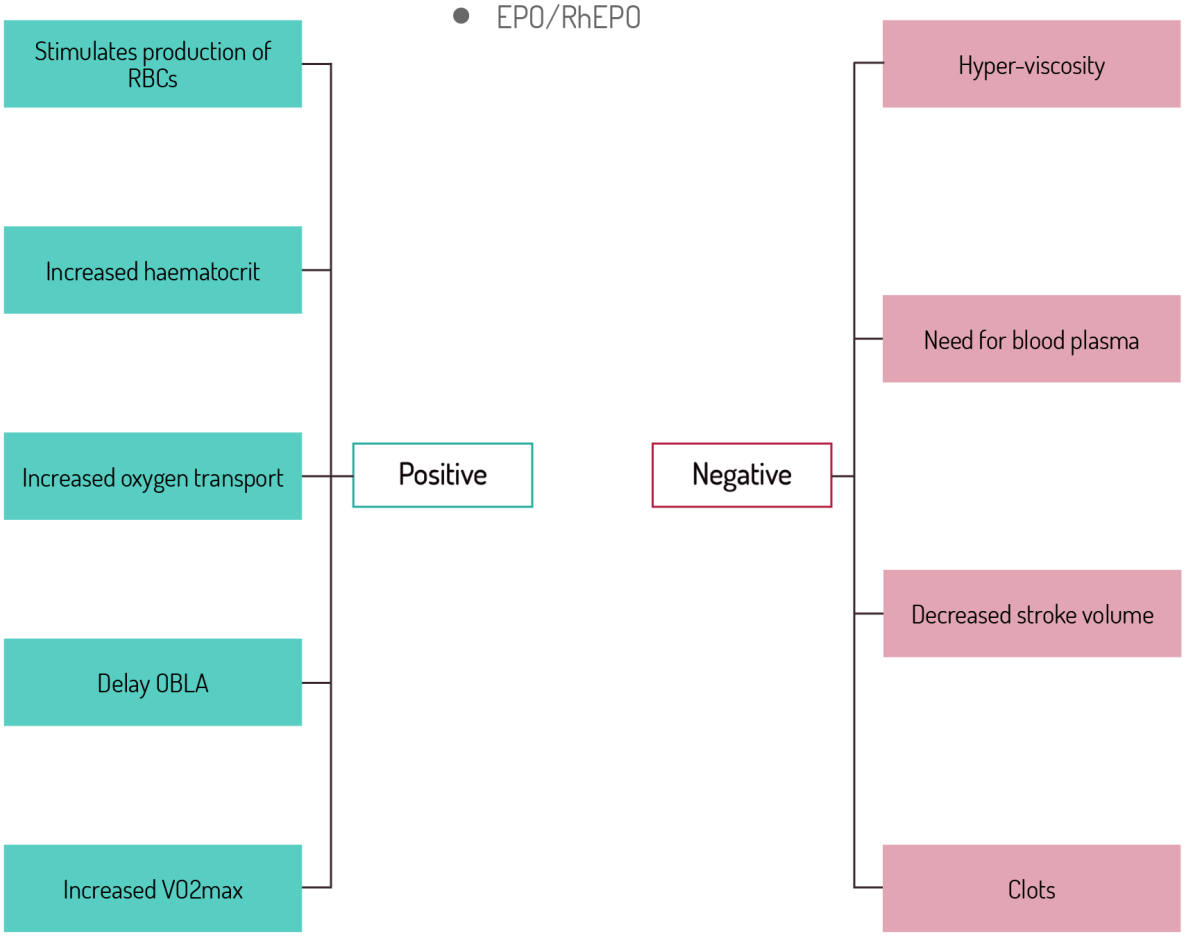
- Mood swings
- Aggression
- Acne
- Liver damage
- Hormonal balance

Notes

Ergogenic Aids

Pharmacological Aid: Erythropoietin

- EPO/RhEPO

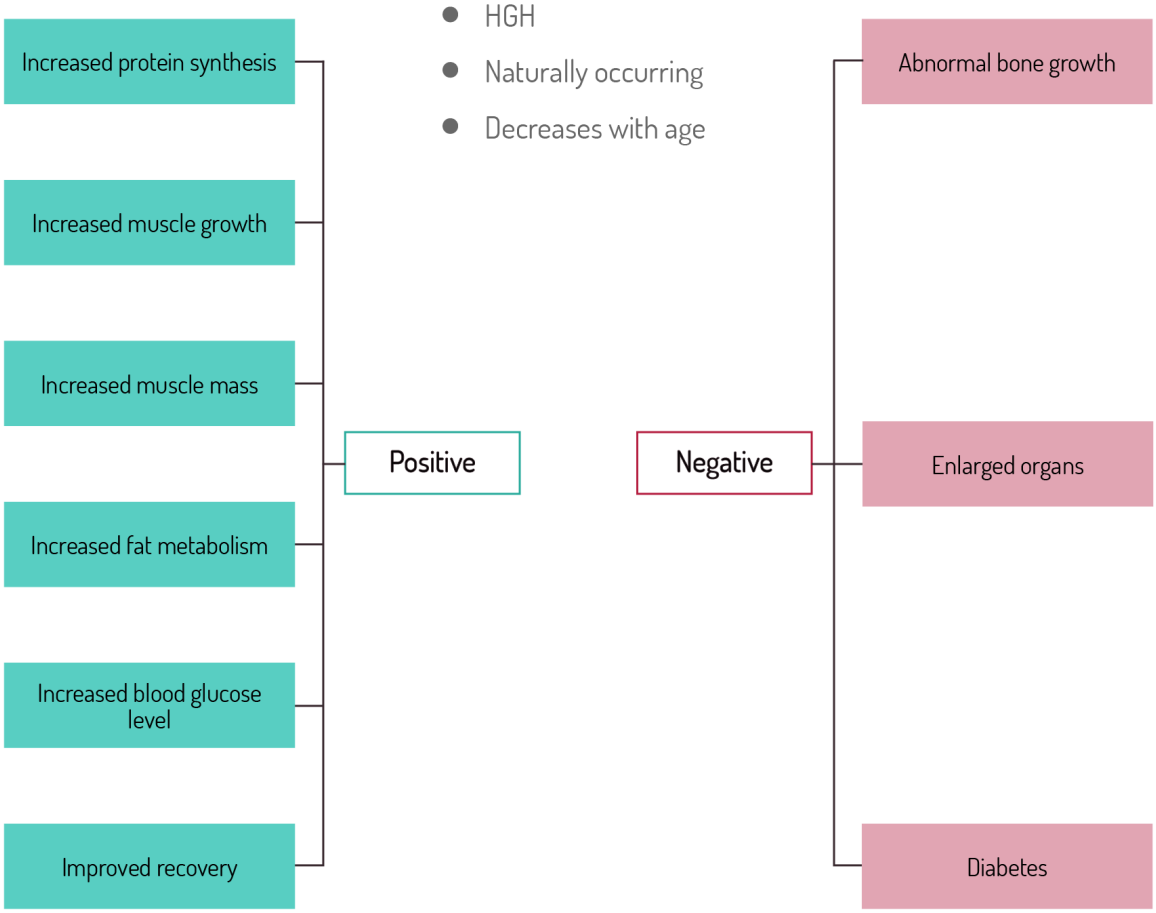


Notes

Ergogenic Aids

Pharmacological Aid: Human growth hormone

- HGH
- Naturally occurring
- Decreases with age



Notes

Ergogenic Aids

Physiological Aid: Blood doping

- Transfusion
- Remove 1-4 weeks before
- Separate RBCs
- Store in deep freeze
- Retransfuse in saline

Positive

- Increased RBCs
- Increased haematocrit
- Increased Hb
- Delay fatigue

Negative

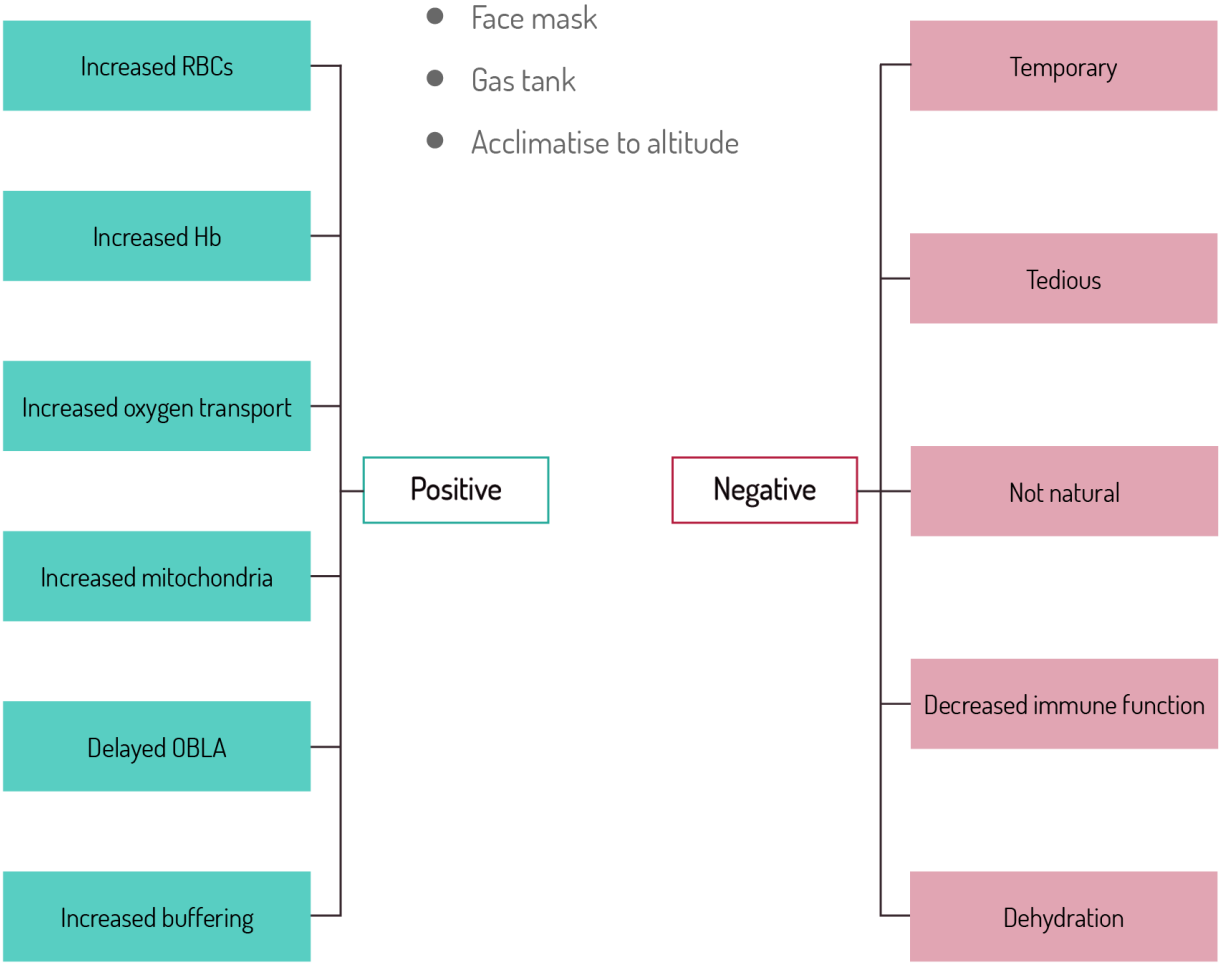
- Increased blood viscosity
- Potential for clots
- Infections
- Decreased cardiac output

Notes

Ergogenic Aids

Physiological Aid: Intermittent Hypoxic Training

- Face mask
- Gas tank
- Acclimatise to altitude



Notes

Ergogenic Aids
Physiological Aid: Cooling Aids

Cooling aid	Examples	Positives	Negatives
Pre-event	• Ice vest • Cold towel wraps	• Decreased CV drift • Decreased chance of overheating • Decreased dehydration • Decreased thermal strain	
Injury	• Ice packs • Cooling sprays • PRICE method	• Decreased inflammatory response • Decreased swelling	
Post-event	• Ice baths • Cryotherapy	• Decreased exercise-induced muscle damage • Prevents DOMS • Fewer injuries	• Ice burns • Masks injuries • Not for the elderly

Notes

Amount of food

Composition of meals

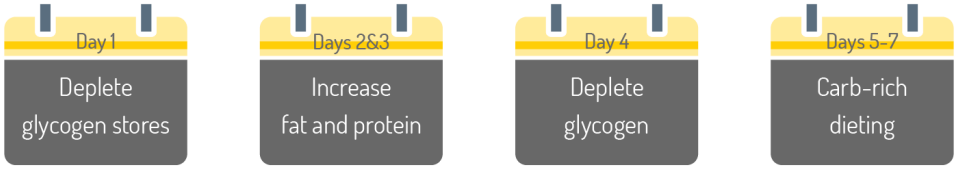
Timing of meals

Hydration

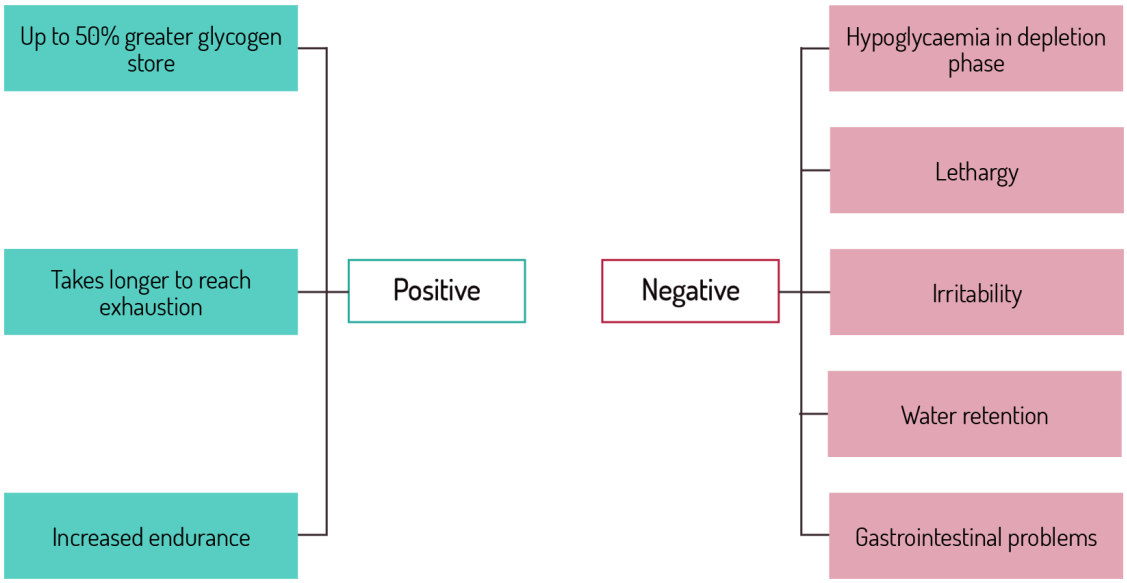
Ergogenic Aids

Nutritional Aid: Glycogen loading

7-day process



Combine with the tapering of training.

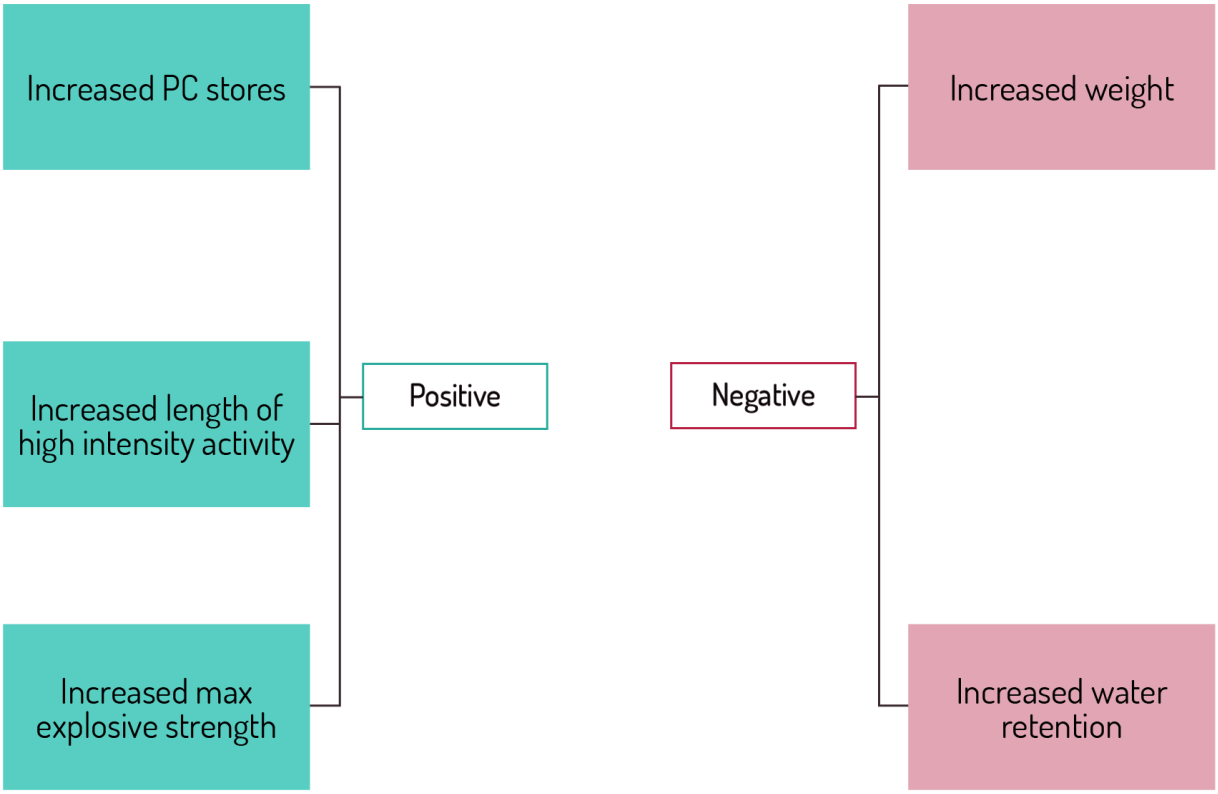


Notes

Ergogenic Aids

Nutritional Aid: Creatine

- From meat/fish
- Amino acids
- Creatine monohydrate

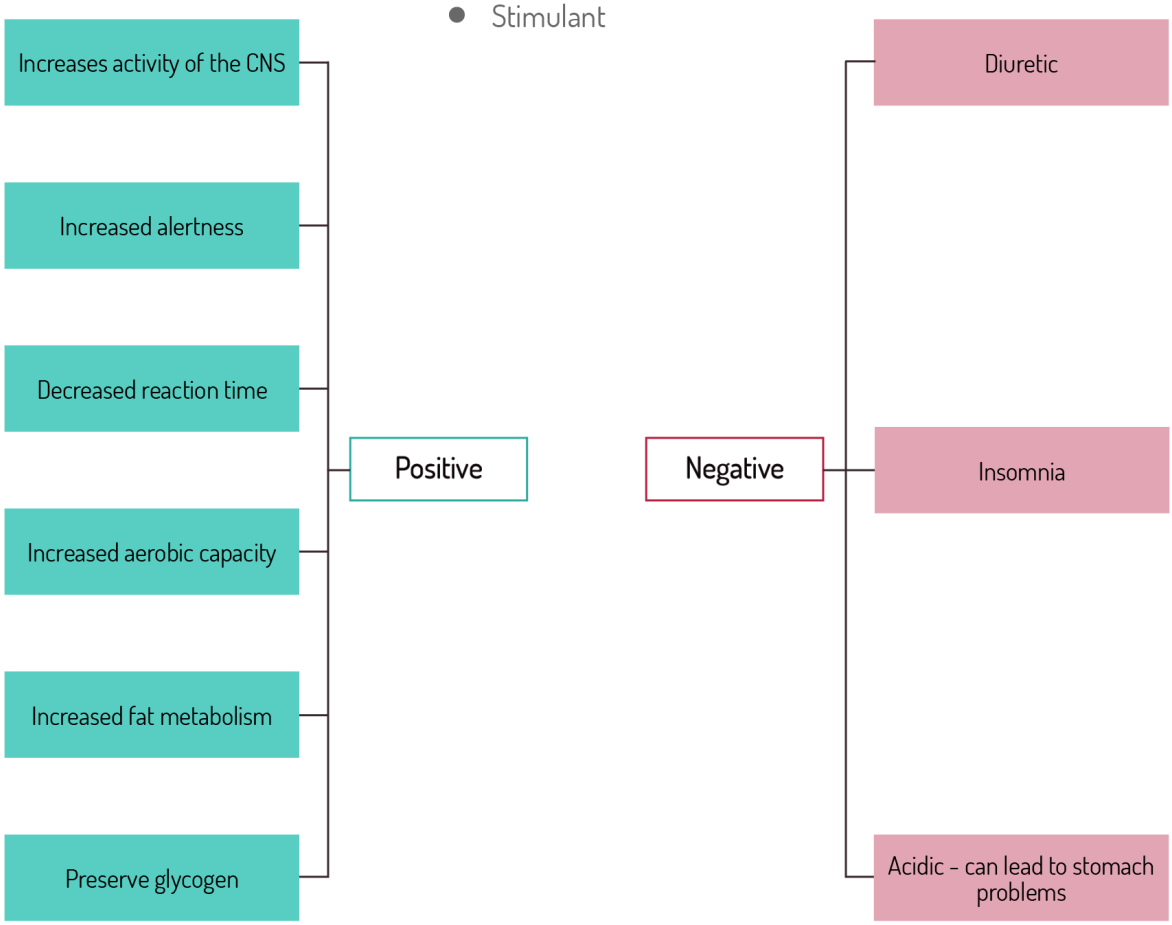


Notes

Ergogenic Aids

Nutritional Aid: Caffeine

- Stimulant

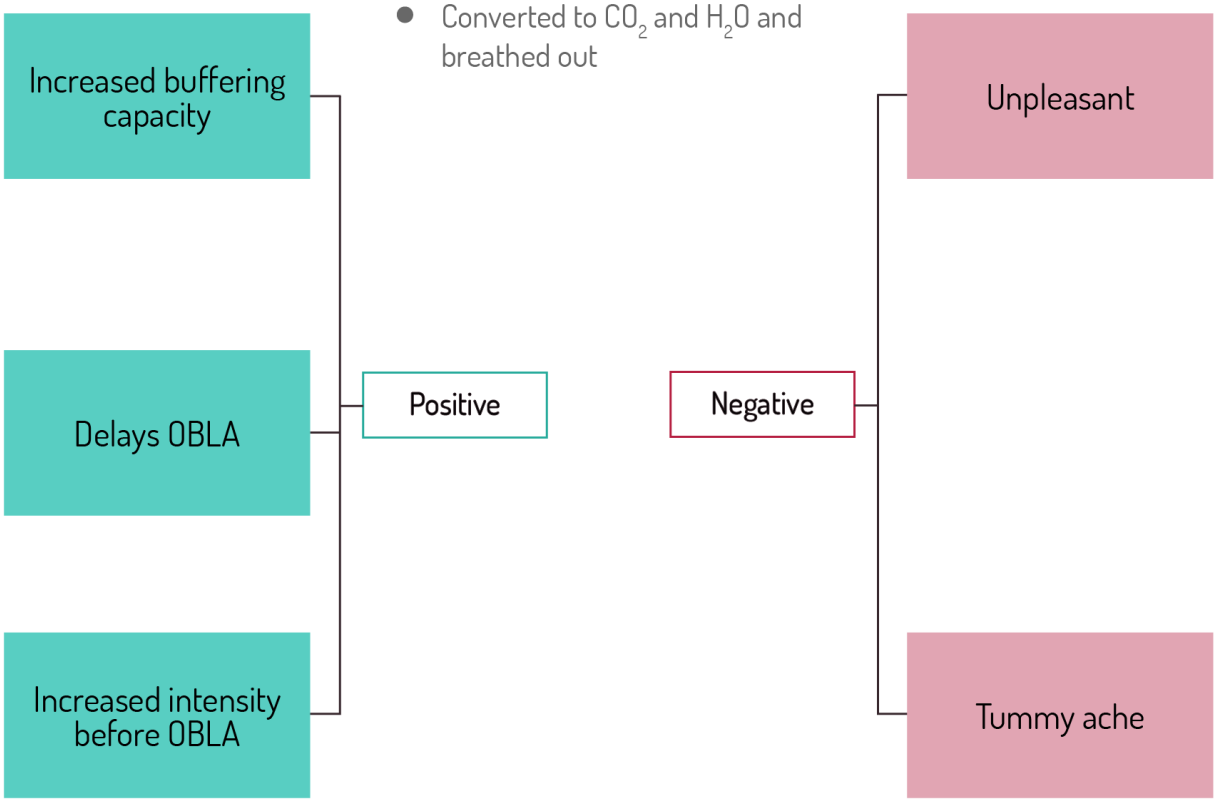


Notes

Ergogenic Aids

Nutritional Aid: Bicarbonate

- $HCO3^-$
- Binds with hydrogen ion
- Binds with hydrogen
- Converted to CO_2 and H_2O and breathed out

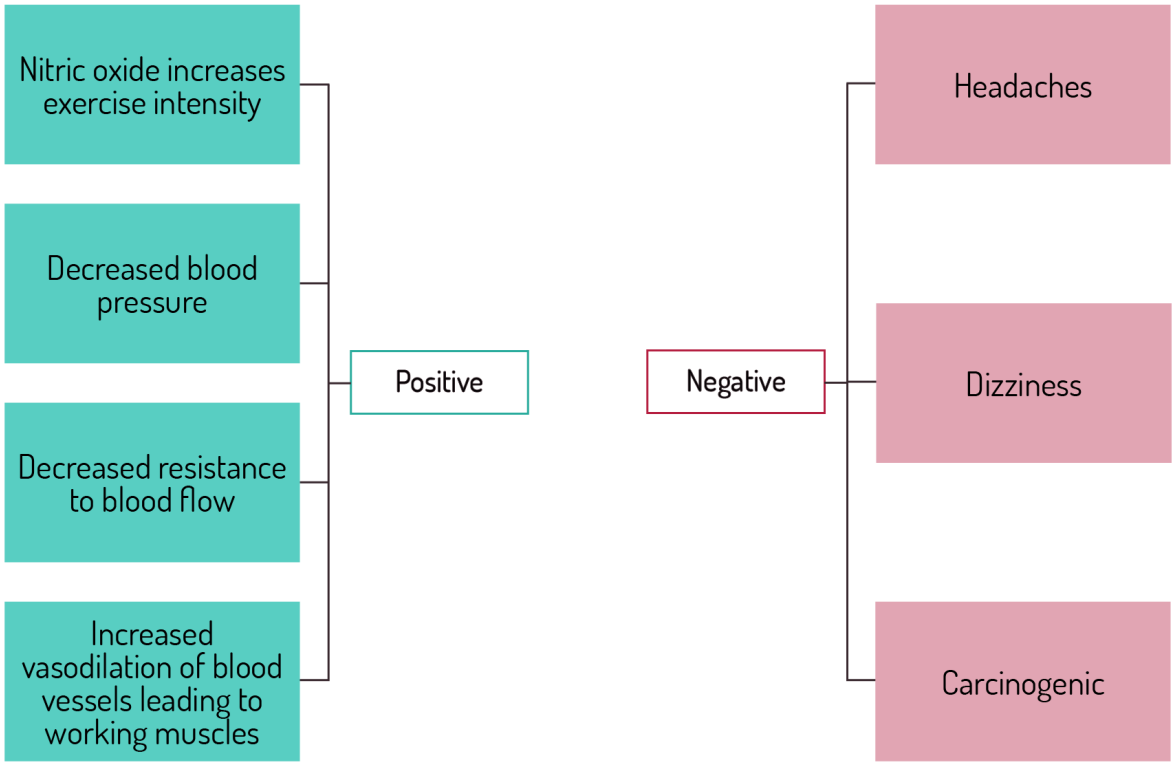


Notes

Ergogenic Aids

Nutritional Aid: Nitrate

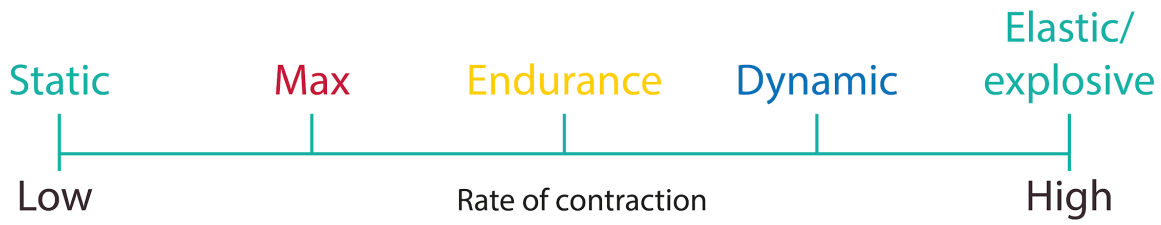
- Inorganic compounds
- Root vegetables
- Stored as nitrites



Notes

Strength training

Types of strength



Notes

Factors affecting strength

Methods of Evaluating Strength 1	
Grip strength dynamometer test	Hold in dominant hand
	Start with your hand up
	Bring down to side/Squeeze the handle/Lower arm
	No swinging your hand
	Repeat three times
	Record the maximum force reading
1 Repetition Maximum (1RM)	Select the body part/Select the muscle group/Test specific muscle
	Weight lifting technique for that body part
	Select a realistic weight
	Lift weight once
	Rest for 5 minutes
	Repeat with heavier weight
	Repeat the process until a weight is selected that cannot be lifted successfully for one rep
	Last weight you lifted successfully
	Usually measured in kilogram

Notes

Method of Evaluating Strength 2	
Press-up and Sit-up Test	Strength Endurance
	Correct sit-up/press-up technique
	Time for 1 minute
	Participant can take breaks within the 60 seconds but clock continues
	Count the number of sit-ups/Count the number of press-ups

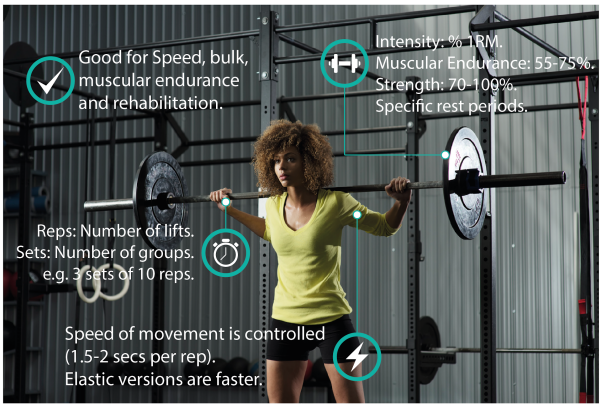
Notes

Notes

Method of Evaluating Strength 3	
Vertical Jump Test	Elastic strength
	Reach up and make a mark/Slide ruler up
	Jump up and touch the board/mark chalk on the wall
	Measure the distance between two marks/measure how high

Training to develop strength

Resistance Training



- Good for rehabilitation
- Endless variations
- Impacts performance
- Muscle isolation

- Poor technique has major side-effects
- Weight machines control movement

Plyometric Training

- Increases power
- Central to many sports
- Very effective

- Can be contraindicating
- Not suitable for unfit people
- Not suitable for young people

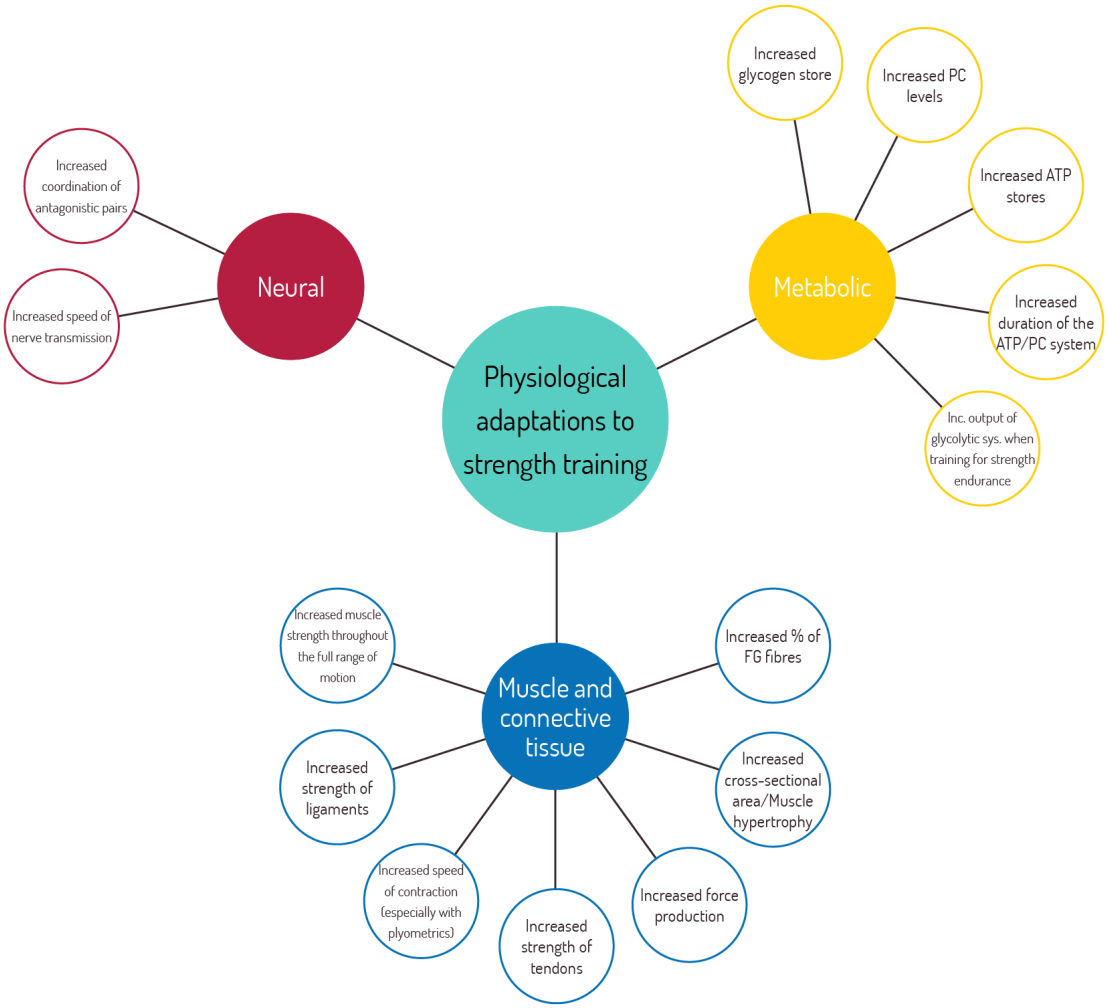
Notes

Interval Training

- Versatile
- Simple
- Effective
- Suitable for different athletes

- Increased intensity so requires motiviation
- Can be monotonous

Notes


Physiological adaptations to strength training
Neural
Increased coordination of antagonistic pairs
Increased speed of nerve transmission
Metabolic
Increased glycogen store
Increased PC levels
Increased ATP stores
Increased duration of the ATP/PC system
Inc. output of glycolytic sys. when training for strength endurance
Muscle and connective tissue
Increased muscle strength throughout the full range of motion
Increased % of FG fibres
Increased strength of ligaments
Increased cross-sectional area/Muscle hypertrophy
Increased speed of contraction (especially with plyometrics)
Increased strength of tendons
Increased force production

Notes

Flexibility training

Types of flexibility

Factors affecting flexibility

Methods of Evaluating Flexibility 1	
Sit and Reach test	Remove shoes
	Sit on floor with legs straight out
	Soles of feet on the box
	Reach forward with one hand on top of the other
	Stretch as far as possible
	Hold for two seconds
	No jerking movements
	Distance reached is measured in cm

Notes

Method of stretching	Description
Static passive	Move the joint into its stretched position using a partner or apparatus
Static active	Performer moves the joint into its stretched position without any external force
Isometric	Isometrically contracting the muscle whilst holding a stretch position
PNF	Static... Contract... Relax... Repeat...
Ballistic	Swinging or bouncing motion than tends to be explosive
Dynamic	Controlled form of ballistic stretching

Notes

Physiological adaptations

Notes

Rehabilitation from injury

Treatment of injuries					
Simple fractures	Stress fractures	Dislocation	Sprain	Torn cartilage	Exercise-induced muscle damage
• Call for medical attention • Isolate injured body part • Immobilise • Apply ice if pain allows • Provide pain relief/anti-inflammatories if appropriate	• Notice signs • Seek x-ray and confirmation • Apply ice • Complete rest • Non-weight bearing activity	• Call for medical attention • Immobilise • Do not attempt to relocate • Apply ice if pain allows • Provide pain relief/anti-inflammatories if appropriate	• Immobilise • Painkillers or anti-inflammatories • Apply PRICE • Strap/brace the joint • Return to movement gradually beginning with non-dynamic activity • Only return to dynamic movement after full recovery	• Reduce movement at the joint • Painkillers or anti-inflammatories • Apply PRICE • Strap/brace the joint • Seek medical advice/scan • Surgery to repair the tissue • No blood supply so will not heal itself • Monitor over time to identify signs of arthritis	• Stop activity • Painkillers or anti-inflammatories • Apply PRICE • Seek medical advice/scan • Apply hot-cold treatment once healing has begun • Massage • Physiotherapy • Return to movement gradually • Strengthen injured muscle over time

Notes

Different treatments

Notes