

Principles of Exercise, Fitness and Health



Unit 4:
Principles of exercise, fitness and health

Physical activity recommendations for health

- 150 minutes of moderate-intensity aerobic activity every week

Or

- 75 minutes of vigorous-intensity activities

Or

- An equivalent combination of both
- Plus
- At least two days a week of muscular strength and endurance training

Move more often, sit down less

Physical fitness

A potential outcome from taking part in regular physical activity and exercise.

- **Health-related fitness** – cardiorespiratory or cardiovascular endurance, muscular strength, muscular endurance, flexibility.
- **Skill-related fitness** – speed, reaction time, agility, balance, coordination, power.

How do we train cardiovascular fitness?

Frequency	Three to five days a week.
Intensity	Moderate to vigorous intensity. <ul style="list-style-type: none">· Moderate: 50-65% of MHR or 12-14 RPE.· Vigorous: 65-90% of MHR or 15-18 RPE.
Time	20-30 minutes or up 60 minutes of continuous or intermittent activity. <ul style="list-style-type: none">· Moderate intensity: 30 minutes, which can be accumulated· Vigorous intensity: 20 minutes sustained.
Considerations	Untrained or deconditioned individuals will need to work towards these recommendations

Muscular fitness

Frequency	Two-three days a week for each major muscle group on non-consecutive days. 48 hours rest between training sessions for specific muscle groups.
Intensity	Percentage of one repetition maximum (1RM): <ul style="list-style-type: none">· 40-50% of 1RM for older adults or sedentary adults.· 60-70% of 1RM for beginners.· > 80% of 1RM for experienced.
Time	Repetitions <ul style="list-style-type: none">· 8-12 repetitions.· 10-15 repetitions for beginners.· 15-20 repetitions for endurance. Sets <ul style="list-style-type: none">· Single sets effective for beginners or older adults.· 2-4 sets for adults.· < 2 sets is effective for endurance. Rest <ul style="list-style-type: none">· Intervals or 2-3 minutes between sets.

Types of resistance may include:

- Body weight exercises, e.g. press ups, yoga and Pilates exercises.
- Dumbbell exercises, e.g. shoulder press
- Resistance band exercises, e.g. biceps curl
- Fixed-resistance machine exercises, e.g. leg press
- Free-weight exercises, e.g. bench press, group resistance training
- Water-based resistance, e.g. using floatation devices
- Manual resistance, e.g. applied by a partner or an opposing limb.

Muscular strength and endurance

Small group task

1. Select a muscular endurance biased body weight exercise.

1. Indicate the reasons why it is predominately endurance.

1. Use the principles listed to make the exercise more strength biased

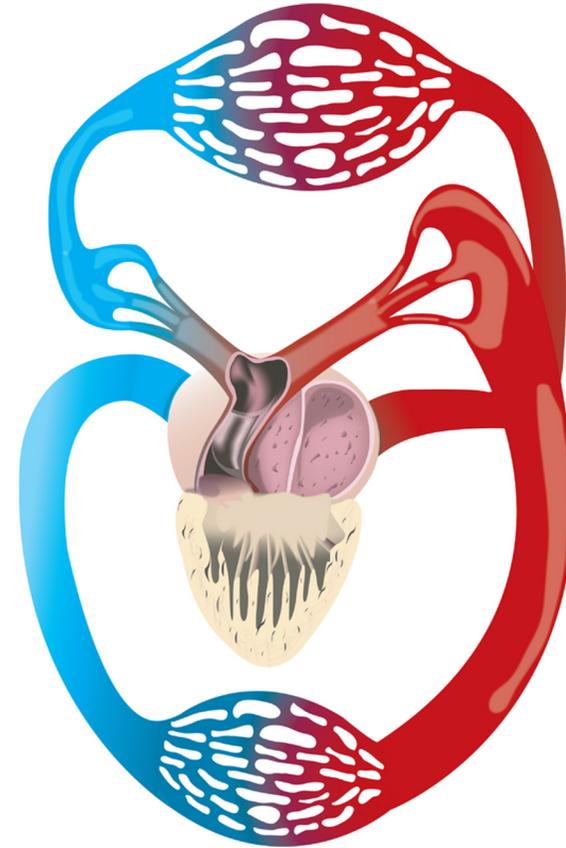
1. Explain the changes you have made

1. Discuss these with the rest of the group

- Rate
- Resistance
- Leverage
- Gravity
- Range of motion

Cardiovascular adaptations (long-term)

- Stronger heart (cardiac muscle).
- Increased stroke volume.
- Increased cardiac output.
- More capillaries in the muscles.
- Waste products removed more efficiently.
- More mitochondria.
- Weight management assisted.
- Risk of cardiovascular disease (CV) is reduced.
- Blood pressure normalised.



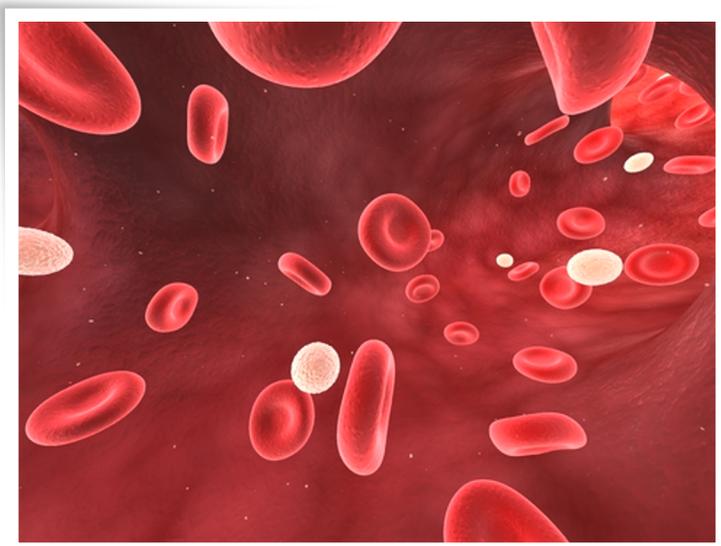
Blood pressure

Short term (immediate):

- An increase in blood pressure in line with exertion

Long term:

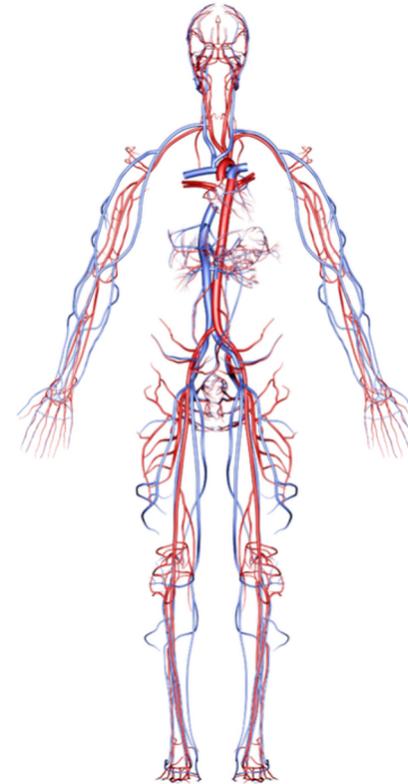
- Aerobic exercise can bring about an average decrease in pressure of 10mmHg



NB: Weight training, circuits or strength work has not been shown to reduce blood pressure in isolation

Blood pooling

- During exercise there is an increased blood flow
- If activity stops suddenly the heart will continue pumping at an elevated rate
- Without skeletal muscular contraction, blood will begin to pool in the limbs, e.g. legs
- Symptoms may include nausea, dizziness and fainting



Tips:

- Cool down thoroughly to lower heart rate
- Keep legs moving during cardiovascular exercise to improve venous return

Skeletal adaptations

Short term:

- Increase in synovial fluid to lubricate joints
- Increase blood circulated (bones have blood supply)

Long term (weight-bearing exercise):

- Stronger ligaments
- Increased bone density
- Reduced bone loss associated with age



Muscular adaptations

Short term:

- Vasodilation
- Diversion of blood to the working muscles
- A temporary 'pump' or increase in muscle size due to circulation

Long term:

- Improved motor fitness and greater efficiency of movement
- Enhancement of neuromuscular connections and motor unit recruitment
- Change in muscular properties, e.g. hypertrophy
- Improved flexibility
- Improved posture



Principles and variables

Pair task

Use the manual to describe the terms listed.

Discuss the physiological implications of these principles

- Specificity
- Progressive overload
- Reversibility
- Adaptability
- Individuality
- Recovery
- Frequency
- Intensity
- Time
- Type

UK Healthy eating advice that underpins a healthy diet

The main guidelines:

- Base all meals around starchy foods (rice, pasta etc.)
- Eat lots of fruit and vegetables (at least 5 per day)
- Eat more fish (2 portions a week, 1 portion should be oily fish)
- Cut down on saturated fat and sugar (including processed food)
- Eat less salt, no more than 6g a day
- Get active and maintain a healthy weight
- Drink plenty of water (6-8 glasses per day)
- Don't skip breakfast
- Use the Eatwell plate when planning and cooking all meals
- Check food labels (traffic light system)
- Eat only as much food as you need (energy)

Source: Public Health England, Welsh Government, Scottish Government and the Food Standards Agency of Northern Ireland (2013)

UK National Food Guide

'The eatwell plate' provides a visual aid for meal planning

It provides similar basic guidelines as those found within the US pyramid

Pair task

What may be the pros and cons of using 'The eatwell plate' as your food guide?

The eatwell plate

Use the eatwell plate to help you get the balance right. It shows how much of what you eat should come from each food group.



Main nutrients

- Carbohydrates (and fibre)
- Proteins
- Fats
- Vitamins
- Minerals
- Water

Healthy eating

Pair task

Each pair to take a specific nutrient.

What is the dietary role of the main nutrients?

List some dietary sources of the main nutrients?

- Carbohydrates (and fibre)
- Proteins
- Fats
- Vitamins
- Minerals
- Water

Energy balance

The concept of energy balance is related to weight management

It states that food (energy in) must be equal to energy utilised by the body to maintain weight

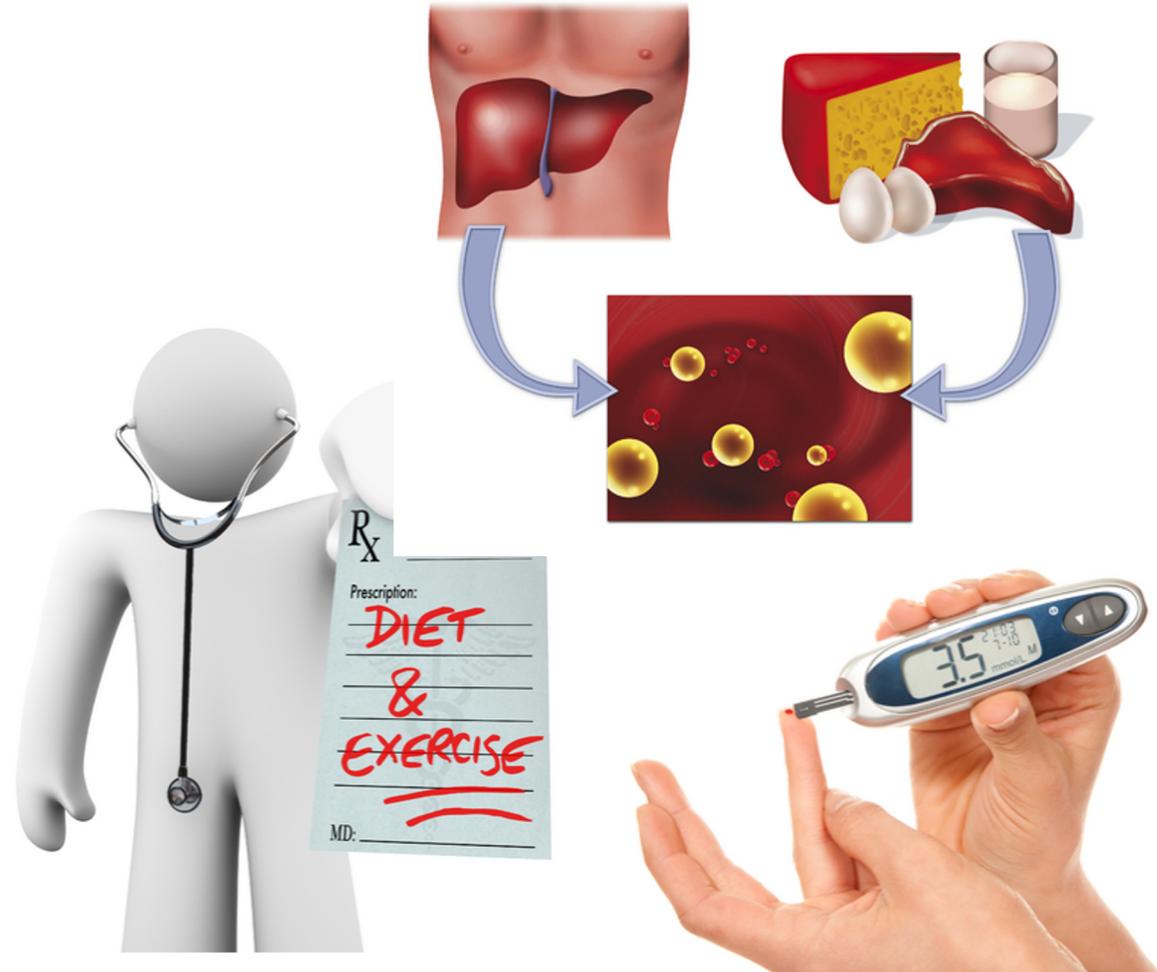
This can be manipulated to favour weight loss or gain



Poor nutrition

The following list of common health complications have all been shown to be associated with a poor diet

- Obesity
- Heart disease
- Stroke
- Some cancers
- Metabolic syndrome
- Diabetes
- Hypertension
- High cholesterol
- Asthma
- Some types of arthritis
- Menstrual irregularities
- Infertility
- Eczema



Professional role boundaries

Provide general healthy eating guidance (eatwell plate) to healthy individuals.

Signpost clients with specific requirements (weight loss, medical conditions etc.) to a qualified dietician or nutritional therapist (via GP)

Forge links with professionals within the local area

Must NOT:

- Advertise as a nutritional specialist
- Write diets
- Recommend supplements

