



USP184 - Exercise, fitness and lifestyle consultation and management

LO1 Understand health-related and skill-related fitness

Content and Assessment Criteria

- Know the terms physical activity, exercise, fitness and health
- Know the training recommendations for all components of physical fitness
- Know the individual and lifestyle factors that can affect fitness and health
- Know how the body responds and adapts to different types of exercise to enable them to prescribe appropriate exercise programmes





Activity

- What is health?



Health

- A state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity (World Health Organisation. 1948)



Components of health and total fitness

Physical

- Cardiovascular fitness
- Muscular fitness
- Flexibility
- Skills related



Health or total fitness

- **Mental**

The mind – being mindful of thinking patterns and being able to manage these in a balanced way

- **Emotional**

The emotions – awareness of emotions (fear, anger, joy, sadness, disgust), emotions are energy in motion. Emotions affect the body. For example, sad/crying



Health or total fitness

- **Nutritional**

Diet and eating – eating a balanced and healthy diet containing the essential nutrients in balance, to meet demands of daily living

- **Medical**

Wellness and wellbeing – no chronic health conditions or injuries

- **Social**

Connections with society – networks of support systems, healthy relationships

- **Spiritual**

Beliefs and attitudes – own philosophy – self, others and community and wider world, for example, nature





Task

- Outline as many physical, social and psychological factors as you can that may contribute to improving wellbeing



Factors affecting health fitness and wellbeing

- Genetics and heredity
- Individual factors – gender, age, ethnicity
- Lifestyle factors – activity levels, nutrition, smoking
- Health inequalities – socioeconomic status, education, ethnicity



Physical activity

Any movement of the body that increases energy expenditure above resting level is considered to be a physical activity.

Physical activities include:

- Activities of daily living (ADLs) – for example, vigorous housework, walking the dog, shopping, gardening
- Active leisure – for example, going to the gym, attending an exercise class, cycling, swimming or jogging
- Sport – for example, tennis, rugby, hockey, badminton or football



Physical fitness

A potential outcome from exercising regularly in a specific way.

- **Health related fitness**

Cardiovascular, muscular strength, muscular endurance, flexibility

- **Skill related (motor) fitness**

Balance, coordination, speed, power, reaction time, agility

Exercise is planned and structured activity, designed to bring about improvement in specific components of physical fitness.



Other definitions

- **Physical activity**

Any movement of the body that increases energy expenditure above resting levels, for example, gardening

- **Exercise**

Activities that are planned, structured and performed regularly with the specific intention of maintaining or improving one or more of the components of physical fitness, for example, weight training

- **Sport**

Activities that may be competitive or recreational, individual or team, played or competed in, for example, ice hockey, football, etc.





Learning check

- What is the difference between health and wellbeing?
- How would you define physical activity?
- List three factors that can affect health and wellbeing
- What is the difference between sport and exercise?



Cardiovascular fitness

The ability of the heart, blood vessels and lungs to take in, transport and utilise oxygen and remove waste products effectively.



Cardiovascular fitness training guidelines

[See ACSM guidelines]

Frequency	3 to 5 days a week
Intensity	Moderate – 40%-59% of heart rate reserve (HRR) Vigorous – 60%-89% of HRR Light to moderate – 30%-39% HRR can be beneficial for deconditioned clients
Time and type	Continuous or intermittent activity, rhythmic, large muscle movements, for example, walking, swimming, cycling <ul style="list-style-type: none">• Between 20-60 minutes<ul style="list-style-type: none">- 30-60 minutes of moderate intensity exercise per day- 20-60 minutes of vigorous intensity exercise per day- <20 minutes per day can be beneficial for previously sedentary individuals <p>A combination of moderate and vigorous intensity exercise daily to attain the recommended targeted volumes of exercise.</p> <p>NB: This recommended amount of exercise may be accumulated in one continuous exercise session or in bouts of ≥ 10 min over the course of a day</p>



Muscular fitness

- **Muscular strength**

The maximal force a muscle or group of muscles can generate during one single effort or contraction, for example, the heaviest resistance that could be lifted once

- **Muscular endurance**

The ability of a muscle or group of muscles to sustain a workload and contract repeatedly for an extended period of time, for example, the number of sit ups or press ups that can be performed



Muscular fitness training guidelines

[See ACSM guidelines]

Frequency	<p>2 to 3 days a week</p> <p>All major muscle groups</p> <p>48 hours rest between training sessions for specific muscles</p>
Intensity	<p>Resistance (% of repetition maximum)</p> <ul style="list-style-type: none">• Experienced: > 80% 1RM• Beginners: 60-70% 1RM• Sedentary or older adults: 40-50% 1RM <p>Repetitions</p> <ul style="list-style-type: none">• Muscular fitness for most adults: 8-12 reps• Beginners and older individuals: 10-15 reps• Muscular endurance: 15-25 reps <p>Sets</p> <ul style="list-style-type: none">• Most adults: 2-4 sets• Single sets for beginners or older adults• < 2 sets for endurance <p>Rest</p> <ul style="list-style-type: none">• 2-3 minutes between sets (NB this may differ depending on training goal)
Time and type	<ul style="list-style-type: none">• Resistance exercises – body weight, free weights etc.• No time specified for duration of one training session

Flexibility

The ability of the muscles to lengthen and enable the joints to move through their full potential range of motion.



Flexibility training guidelines

[See ACSM guidelines]

Frequency	At least 2 to 3 days a week Ideally every day
Intensity	Stretch to the point of mild tension or slight discomfort
Time and type	<p>Static stretching</p> <ul style="list-style-type: none">• Stretches held for 10-30 seconds• 30-60 seconds may be more beneficial for older adults• A total of 60 seconds per joint is recommended• Stretches can be repeated 2-4 times to achieve this total, for example 3 x 20 seconds <p>PNF stretching</p> <p>3-6 seconds of mild to moderate contraction (20-75% MVC) followed by 10-30 seconds assisted stretch</p>



Skill-related (motor) fitness

- **Balance**
Being able to control the body's position when moving or not moving
- **Coordination**
Being able to control the movement of the limbs in an efficient way
- **Power**
Strength x speed
- **Speed**
How fast a movement can be performed – the rate
- **Reaction time**
Time it takes to respond to a stimulus
- **Agility**
Being able to perform a series of successive movements in different directions





Activity

Identify which sports could benefit from improvements to the following skills related fitness.

- Balance
- Coordination
- Power
- Speed
- Reaction time
- Agility





Learning check

- Define the health-related components of fitness
- Define the skill-related components of fitness
- Explain the difference between muscular strength and muscular endurance
- What are the ACSM's guidelines for CV training?



Factors that affect health and fitness

- Individual factors
- Levels of activity/training experience
- Lifestyle factors
- Health inequalities

In pairs discuss how each of these factors influences a person's level of health and fitness.





Activity

How does the skeletal system respond to exercise?

- Consider:
 - Bone development
 - Posture
 - Joint range of movement



Immediate/**short term** effects

Skeletal:

- Increased blood circulated to bones and joints
- Increased synovial fluid in the joints (lubrication)
- Increased joint mobility
- Connective tissue compliance at joints
- Cartilage nourishment



Long term adaptations

Skeletal:

- Improved bone mineral density
- Improved development of peak bone mass in formative years (up to age 30)
- Maintenance of bone mass pre-menopause
- Reduces rate of bone loss post-menopause
- Reduced risk of osteoporosis
- Healthier hyaline cartilage
(which can assist with the management of osteoarthritis)



Long term adaptations

- Maintenance or improved joint mobility and range of motion
- Stronger ligaments and other joint connective tissues
- Reduced risk of joint injury
- Improved posture
- Reduced risk of falls and bone fractures in older adults with osteoporosis
- Reduced risk of low back pain

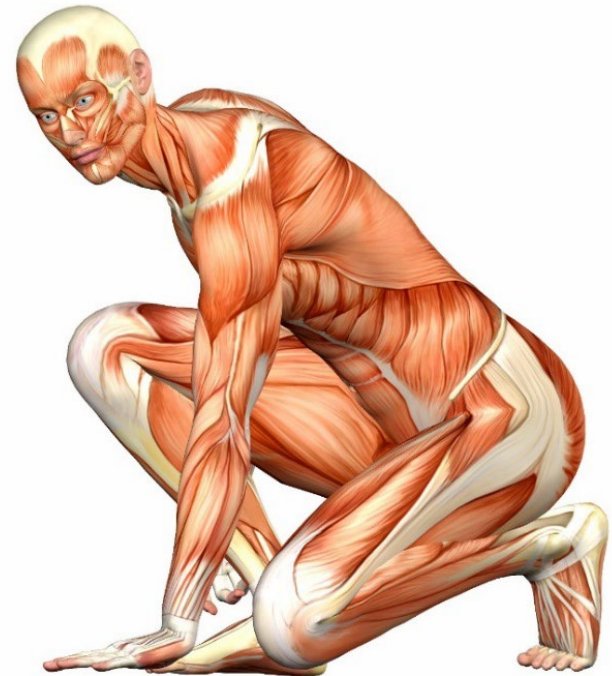




Activity

How does the muscular system respond to exercise?

- Consider:
 - Muscle fibre recruitment
 - Force production
 - Metabolism
 - Range of movement



Neuromuscular adaptations: **short term**

- Increased muscle fibre recruitment
- Muscle temperature increases
- Increased metabolic activity
- Increased demand for oxygen
- Increased dilation of capillaries within the muscle
- Increased pliability of muscle and connective tissue (greater extensibility)
- Neuromuscular pathways engaged



Neuromuscular adaptations: long term

- Hypertrophy of muscle fibres (increase in size – due to increased number of myosin and actin within muscle)
- Increased muscle strength and/or endurance depending on training history
- Increased muscle tone and metabolic activity
- Increased capillarisation of muscles following endurance training – greater potential for delivery of oxygen and nutrients and removal of waste products improves endurance
- Increased tolerance to lactic acid following anaerobic training



Neuromuscular adaptations: long term

- Increased size and number of mitochondria in type I and IIa muscle fibres to enable greater aerobic energy production following endurance training
- Increased myoglobin in type I and IIa muscle fibres following endurance training
- Improved posture – provided training approach is balanced
- Improved proprioception – spatial and body awareness
- Improved skill-related fitness (motor fitness)



Neuromuscular adaptations: long term

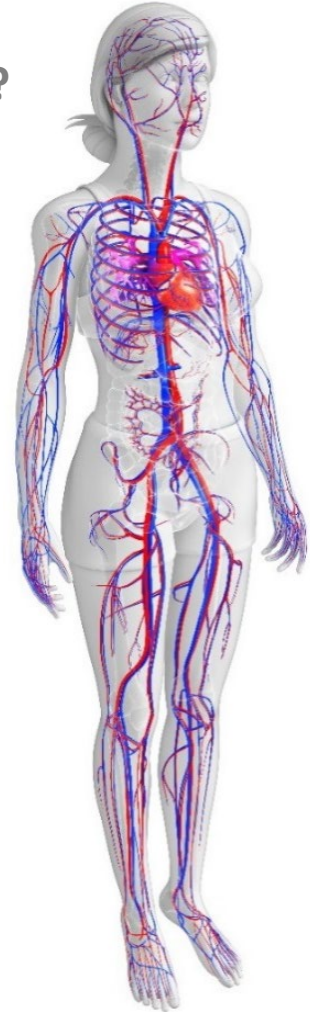
- Enhancements to neuromuscular activity and motor fitness
 - Resistance training adaptations (improved motor unit recruitment)
 - Motor skills training adaptations
 - growth of new nervous system connections
 - increased frequency of nerve impulses to motor units
 - improved synchronous motor unit recruitment
- Benefits of improved neuromuscular co-ordination
 - Improved movement efficiency and economy
 - Improved accuracy of movement patterns





Activity

What are the effects of exercise on the cardiovascular system?



Immediate/**short term** effects

Cardiovascular:

- Heart rate increases
- Increased circulation to working muscles
 - Stroke volume
 - Cardiac output
- Increase in systolic blood pressure
- Vasodilation of blood vessels
- Vascular shunt



Exercise and blood pressure

Short term:

- No change in diastolic pressure
- Progressive increase in systolic pressure (SBP) during CV training
- Rapid and greater increase in SBP during resistance training
- Reduced BP for up to 24 hours after physical activity

Long term:

- Reduction in resting blood pressure
- Improved regulation of blood pressure



Long term adaptations

- Stronger heart (increased mass of myocardium – cardiac muscle).
The left ventricle thickens (cardiac hypertrophy)
- Increased resting, submaximal and maximal stroke volume
- Increased maximal cardiac output
- Improved blood flow to working muscles – combination of increased capillary network and reduced peripheral resistance of blood vessels
- Decreased resting heart rate (heart rate at rest)



Long term adaptations

- Lower working heart rate at same intensity or effort
- Increased number of muscle capillaries
- Increased elasticity of blood vessels
- Improved cholesterol profile
- Increased potential for oxygen delivery to muscles
- Increased potential for removal of waste products from the muscles



Long term adaptations

- Reduced recovery times
- Reduction in resting blood pressure, improved regulation of blood pressure
- Improved ability to tolerate heat
- Improved aerobic fitness
- Reduced risk of cardiovascular diseases



Short term respiratory system responses



- Increased tidal volume
- Increased breathing rate and depth
- Increased gaseous exchange
- Increase in respiratory muscle action



Long term respiratory system adaptations

- Increased number of alveolar capillaries
- Increased minute ventilation
- Increased strength of respiratory muscles
- Increased vital capacity
- Increased tidal volume
- Reduced resting respiratory rate
- Improved potential for gaseous exchange



Summary of the Energy systems

- Adenosine triphosphate
- Re-synthesised via **THREE** energy system:
 - ATP-CP – anaerobic
 - Glycolysis – anaerobic
 - Oxygen – aerobic
- Different fuels
 - Phosphocreatine
 - Carbohydrate, fat and protein (nutrients)
- Different waste products



Energy systems	Creatine phosphate	Lactate	Aerobic
Time to engage	Very quick	Quick	Slower
Use of oxygen	Anaerobic	Anaerobic	Aerobic
Fuel	Phosphocreatine	Glycogen	Glycogen and fat
ATP production	Very limited ATP	Limited ATP	Unlimited ATP
By-products	Creatine	Lactate	Carbon dioxide and water – easily removed
Duration	Short Around 8-15 seconds	1-3 minutes intense activity	Long Beyond 3 minutes
Intensity	Very high (95-100% maximum)	High (60-95% maximum)	Low to moderate (up to 60% maximum)
Recovery	Fast 30 seconds to 5 minutes	Slower 20 minutes to 2 hours – dispersal of lactic acid	Slower Replenish fuel stores by eating
Muscle fibre type	Type IIb	Type IIa	Type I



Aerobic adaptations

- Increased efficiency of the heart and lungs
- Stronger heart muscle, increased stroke volume
- Lower resting heart rate and lower working heart rate for a given intensity
- Increased number of red blood cells and capillarisation in the muscles
- Increased size and number of mitochondria
- More efficient gaseous exchange in the lungs and at a muscular level
- Increased oxygen uptake
- Improved efficiency of oxygen use at a muscular level
- Improved removal of metabolic waste products



Anaerobic adaptations

- Increased stores of creatine phosphate
- Increased capacity to store muscle glycogen
- Increased muscle fibre diameter
- Greater force production capacity of muscle fibres
- Increased efficiency of lactic acid removal from the muscles
- Improved resistance to fatigue during high-stress, anaerobic exercise
- Improved recovery after high-intensity exercise





USP184 - Exercise, fitness and lifestyle consultation and management

LO2 Know the role of exercise and physical activity in the prevention and management of chronic health conditions

Content and Assessment Criteria

- Know the current guidelines and recommendations for physical activity to maintain health
- Know the benefits of physical activity on the prevention and management of chronic health conditions



Guidelines and recommendations for physical activity to maintain health

ACSM (2018) and Department of Health (2011) guidelines or revised/updated guidance

- **Adults (19-64)**

- 150 minutes of moderate-intensity aerobic activity every week, for example, 5 days for 30 minutes (time can be accumulated in bouts of 10 minutes or more)
- Or 75 minutes of vigorous-intensity activities (at least 20 minutes, 3 days a week)
- Or an equivalent combination of moderate and vigorous-intensity activities
- Plus 2 days a week muscular fitness training



- **Older adults (65+)**

- 150 minutes of moderate-intensity activity over a week, for example, 5 days a week 30 minutes per day (in bouts of 10 minutes or more)
- 20 mins of exercise per day may be beneficial for previously sedentary individuals
- Or for the already active older adults – 75 minutes of vigorous intensity activity
- 2 days a week – activities to improve muscle strength
- Some physical activity is better than none
- Older adults at risk of falls should include activities to improve co-ordination and balance on at least 2 days a week
- Minimise sedentary time



- **Children and young people (5-18)**

- 1 hour a day of moderate to vigorous activity – playground games, running and gymnastics
- 3 days a week – vigorous activities to strengthen muscles and bones – climbing and jumping
- Minimise inactive leisure time

- **Early years – under 5's**

- 3 hours of physical activity throughout the day
- For babies – crawling, floor play and moving the limbs
- For toddlers who are walking – playing ball games, climbing and riding a bike
- Minimise buggy time



Health benefits of regular physical activity

- Reduced early mortality, reduced morbidity from coronary heart disease, stroke, diabetes, certain cancers
- Improved mental health and psychological wellbeing, reduced risk of anxiety, stress and depression
- Improved weight management and body composition, reduced risk of obesity
- Improved posture, prevention of lower back pain, reduced risk of injury, improved joint stability
- Increased bone density, reduced risk of osteoporosis
- Improved quality of life, improved independence, reduced risk of falls (older adults)
- Improved ability to perform active daily living tasks, improved functional capacity



Effects of physical activity on disease and medical conditions

- **Coronary heart disease**

Reduced blood pressure, improved blood cholesterol profile, improved elasticity of blood vessels, capillarisation, improved blood flow distribution

- **Some cancers**

Increased physical activity is associated with reduced risk of colon cancer, other healthier lifestyle choices, and reduced stress and improved body composition that may protect from some other cancers

- **Type 2 diabetes**

Improved regulation of insulin, improved blood glucose regulation



Effects of physical activity on disease and medical conditions

- **Hypertension**
Reduced blood pressure, improved blood flow distribution, improved elasticity of blood vessels
- **Obesity**
Improved fat metabolism, increased calorie expenditure
- **Osteoporosis**
Increased bone formation, improved or maintenance of bone density, improved posture, reduced risk of injury
- **Mental health**
Improved mood, increased sense of wellbeing



Sources of information

- Department of Health
- NICE
- Change 4 life
- Diabetes UK
- MIND
- Mental Health Foundation
- Rethink
- British Heart Foundation
- Chief Medical Officer reports





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LO3 Know the exercise contra-indications and key safety guidelines for special populations

Content and Assessment Criteria

- Know the exercise contra-indications and safety guidelines for older adults (50+)
- Know the exercise contra-indications and safety guidelines for antenatal and postnatal clients
- Know the exercise contra-indications and safety guidelines for younger people (13-18)
- Know the exercise contra-indications and safety guidelines for disabled people



Exercise contra-indications and safety guidelines for **older adults (50+)**

Definition of older adults (ACSM. 2014/2018)

- Aged 65 and over
- Aged 50-64 with chronic health conditions or physical limitations

Contra-indications:

- Elevated resting blood pressure (see ACSM/NICE for current guidelines)
- Resting heart rate of 90bpm or higher
- Multiple CVD risk factors
- Combinations of symptoms of other chronic health conditions also contra-indicated
- Risk of falls, poor functional status



Exercise contra-indications and safety guidelines for older adults (50+)

Safe exercise guidelines:

- Pre-exercise health screening, refer to other professionals if required
- Undertake longer and more gradual mobility and warm-up, undertake a gradually tapered cool down
- Exercise intensity must be at a challenging but health-related level
- Use RPE scale to monitor intensity
- Emphasise correct exercise technique
- Increase duration of transitions
- Simplify exercise when required
- Learn new exercises at the most basic level
- Avoid extreme spinal flexion



Exercise contra-indications and safety guidelines for **ante and postnatal clients**

Contra-indications:

- Relative
 - Severe anaemia
 - Unevaluated maternal cardiac arrhythmia
 - Chronic bronchitis
 - Poorly controlled type I diabetes
 - Extreme morbid obesity
 - Extremely underweight (body mass index <12)
 - History of extremely sedentary lifestyle
 - Intra-uterine growth restriction in current pregnancy
 - Poorly controlled hypertension/pre-eclampsia
 - Orthopaedic limitations
 - Poorly controlled seizure disorder
 - Poorly controlled thyroid disease
 - Heavy smoker



Exercise contra-indications and safety guidelines for **ante and postnatal clients**

Contra-indications:

- Absolute
 - Haemodynamically significant heart disease
 - Restrictive lung disease
 - Incompetent cervix/cerclage
 - Multiple gestation at risk for premature labour
 - Persistent second or third trimester bleeding
 - Placenta praevia after 26 weeks gestation
 - Premature labour during the current pregnancy
 - Ruptured membranes
 - Pregnancy induced hypertension
 - Warning signs to terminate exercise when pregnant



Exercise contra-indications and safety guidelines for **ante and postnatal clients**

Contra-indications:

- Absolute
 - Vaginal bleeding
 - Dyspnoea before exertion
 - Dizziness
 - Headache
 - Chest pain
 - Muscle weakness
 - Calf pain or swelling (need to rule out thrombophlebitis)
 - Preterm labour
 - Decreased foetal movement
 - Amniotic fluid leakage



Exercise contra-indications and safety guidelines for **ante and postnatal clients**

Safety considerations:

- Do not exceed 45 minutes duration
- Maintain adequate hydration and calorie intake
- Avoid exercising in hot and humid conditions
- Use the RPE scale to monitor intensity not heart rate
- Avoid supine exercise after 16 weeks of pregnancy
- Avoid prone exercise
- Avoid prolonged motionless standing
- Avoid heavy isometric exercise



Exercise contra-indications and safety guidelines for **ante and postnatal clients**

Safety considerations:

- Avoid leg adduction and abduction against resistance
- Avoid loaded forward flexion
- Avoid rapid changes of direction
- Avoid uncontrolled twisting or ballistic movements
- Avoid risk of falling or trauma
- Avoid high intensity or impact exercise
- Avoid crunching and twisting abdominal exercises
- Follow exercise guidelines for trimesters of pregnancy



Exercise contra-indications and safety guidelines for **young people (13-18)**

Contra-indications:

- Check for general exercise contra-indications where appropriate
- Stage of growth and development, musculoskeletal injuries (growth plates)

Safety guidelines:

- Wear appropriate clothing and footwear
- Undertake a gradual warm up and cool down
- Avoid heavy resistance exercises
- Use RPE to monitor exercise intensity
- Resistance training should use lighter weights and higher reps
- Emphasise correct exercise technique
- Avoid ballistic stretching
- Ensure adequate hydration and calorie intake



Exercise contra-indications and safety guidelines for **disabled people**

Physical and medical conditions with disabling symptoms include:

- Sensory – deafness, partially hearing, blind, partially sighted
- Cognitive – Down's syndrome
- Medical – cancer, fibromyalgia, stroke, obesity, arthritic conditions, HIV/Aids
- Mental – severe depression, post-traumatic stress disorder
- Physical – limb amputation, cerebral palsy



Exercise contra-indications and safety guidelines for **disabled people**

Contra-indications:

- Impaired physical condition and function
- Impaired motor skills
- Impaired neurological or cognitive function
- Impaired sensory function
- Musculoskeletal imbalances
- Postural deviations



Exercise contra-indications and safety guidelines for **disabled people**

Safety guidelines:

- Medical screening and referral prior to participation
- Refer to other professionals if required
- Consideration to equality and inclusion legislation
- Undertake exercise in a safe and supportive environment
- Make reasonable adjustments to enable access
- Adapt exercise for the specific disability
- Provide specialist assistance if required
- Incorporate functional and life related movement
- Use specialist equipment if required





USP184 - Exercise, fitness and lifestyle consultation and management

LO4 Know the importance of healthy eating

Content and Assessment Criteria

- Know the dietary role and sources of the key nutrients
- Know the importance of adequate hydration
- Know the energy balance equation in relation to weight management
- Know the health risks associated with poor nutrition and unhealthy eating
- Know the professional role boundaries when providing nutritional advice



The main nutrients

Macronutrients:

- Carbohydrates, including fibre
- Proteins
- Fats

Micronutrients:

- Vitamins
- Minerals



Carbohydrates – 4 kcal per gram

The main fuel for energy.

- **Simple carbohydrates – sugar**

- Monosaccharides, disaccharides
- Found in cakes, sweets and fruit



- **Complex carbohydrates – starch**

- Polysaccharides, soluble and insoluble fibre
- Found in pasta, rice, bread, vegetables and potatoes



Fibre – 4 kcal per gram

- Complex carbohydrate
- Adds bulk, roughage to the diet
- Assists movement of food through digestive system
- Assists removal of waste
- Found in vegetables, fruits and whole grains



Protein – 4 kcal per gram

- Main role is growth and repair
- Structured from amino acids



Protein – 4 kcal per gram

Animal protein

- Contains all amino acids
- Found in red and white meat, fish and dairy products, for example, cheese, eggs

Vegetable protein

- Different sources contain different amino acids
- Found in beans, nuts, grains and pulses, for example, lentils



Fats – 9 kcal per gram

Main role:

- Provides insulation and warmth
- Protects the internal organs
- Stores vitamins A,D,E, and K
- Provides fuel for energy



Type of fat in the diet

– 9 kcal per gram

- Saturated
- Polyunsaturated
- Omega 3
- Omega 6
- Monounsaturated
- Trans fats



Type of fat in the diet

– 9 kcal per gram

Saturated

- Meat, dairy products, eggs and coconut oil
- Raise large LDL but not small LDL



Polyunsaturated

- Oily fish and plant oils
- Omega 3 – oily fish, walnuts, walnut oil, pumpkin seeds
- Omega 6 – soya oil, sunflower oil, sesame oil, peanut oil



Type of fat in the diet

– 9 kcal per gram

Monounsaturated

- Meat, avocado, seeds, peanut butter and olive oil
- Lower harmful LDL

Trans fatty acids

- Some 'take-aways', cakes, biscuits, pastries and margarines



Type of fat in the diet

– 9 kcal per gram

Trans fats

- Harmful
- Most are formed artificially during hydrogenation
- Hydrogenation changes chemical structure
- Increase LDL cholesterol and lower HDL cholesterol
- Avoid foods with hydrogenated oils on labels
- Trans fats are used by manufacturers because they are cheap to produce and have a long shelf life
- Not a legal requirement to declare the number of trans fatty acids



Vitamins and minerals

Different vitamins and minerals have different roles, including:

- Growth and repair
- Healthy skin, hair, teeth, vision
- Cell function and immune system
- Enzyme action
- Repair and functioning

Sources:

- Abundant in fruit and vegetables
- Variety and colour in diet is key



Vitamins

- Energy metabolism
- Protein
- Synthesis
- Glycogen synthesis
- Blood clotting
- Red blood cell formation
- Aid growth
- Maintenance of teeth and bones
- Aid vision



Minerals

- Bone growth
- Teeth growth
- Energy production
- Enzyme function
- Nerve and muscle function
- Water balance
- Blood clotting
- Oxygen transport in red blood cells





Activity

Home study task – find out the main role of each of the main vitamins and minerals.

Vitamins

- Fat soluble vitamins A-D-E-K
- Water soluble vitamins B-C
- Antioxidants vitamins C and E

Minerals

- Calcium
- Iron
- Potassium
- Magnesium
- Sodium



Water

A large percentage of the body is made up of water, for example, blood.

Water is essential for:

- Life
- Mental functioning
- Physical functioning
- Performance
- Efficiency of all body systems
- Maintaining homeostasis



Sweating – perspiration

- A vital body function
- Cools the body
- Maintains safe core temperature – 35-38 degrees C
- Prevents overheating
- During sport and exercise fluid loss can be high, depending on intensity
- Fluid loss can be around 500ml in 30 minutes
- Fluid loss increases when exercising for longer durations and in humid conditions



Factors affecting hydration

Hydration levels will be influenced by:

- Activity levels – intensity and duration
- Humidity
- Temperature of the environment
- Body temperature



Effects of dehydration

- Can affect strength and power training – reduce lifting potential
- Reduce performance in endurance events
- Reduce running speed
- Perceived exertion can be higher due to higher heart rate and core temperature. If dehydration is prolonged – serious health consequence
- Some research shows increase in cortisol (catabolic hormone) and reduced testosterone (anabolic hormone) effecting muscle adaption
(*Anita Bean. Food for fitness*)



Optimal hydration

- Water is the best source
- Start workout, event or competition feeling hydrated
- Drink regularly – little and often, rather than loading up
- Recommended intake 2 litres for woman and 2.5 litres for men, per day – **around 6-8 glasses**
- Other fluids can have a dehydrating effect
- ACSM recommend 5-7ml of fluid per kg of body weight 4 hours before exercising

Source: Anita Bean. *Food for fitness*.



During exercise

For higher intensity training:

- **Training less than 1 hour**

Water should be enough

- **Training over an hour**

Drinks containing squash or cordial may be better than plain water

- **Training more than 2 hours**

Drinks containing sodium and sugar may help to improve endurance



Energy balance equation

Energy intake – all foods and drinks taken into the body that contain calories, including tea, coffee and alcohol.

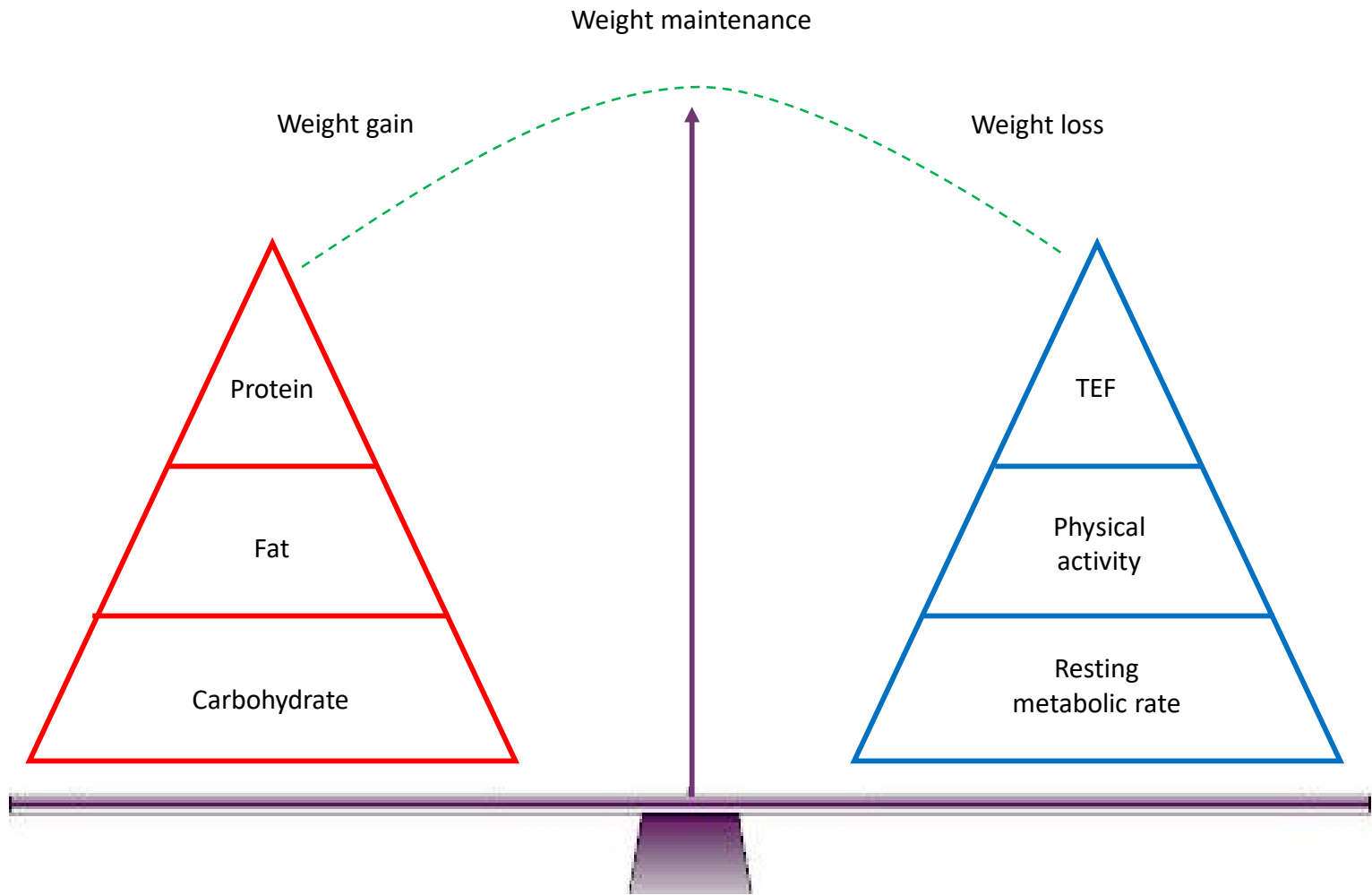
- Alcohol – 7 calories per gram
- Fat – 9 calories per gram
- Protein – 4 calories per gram
- Carbohydrate – 4 calories per gram

Energy output – all the sources for energy expenditure and use of calories, including:

- Resting metabolic rate (RMR)
- Activities of daily living (ADLs)
- Exercise and sport



Energy balance



Energy balance equation



To maintain weight energy intake and energy output need to be balanced



To lose weight, energy input needs to be less than energy output



To gain weight energy input would need to exceed energy output



Effects of poor nutrition on health

- Adverse blood cholesterol levels
- Increased body fat/obesity
- Chronic diseases associated with poor nutrition, for example, obesity, type 2 diabetes, heart disease, stroke, osteoporosis, cancer, atherosclerosis, hypertension, arthritis, mental health problems (depression, anxiety)
- Acute conditions associated with nutritional deficiencies, for example, anaemia, dehydration, hypoglycaemia



Professionals and professional bodies

Professionals

- Dietician
- Nutritionist
- G.P. (signposting and referral)

Professional bodies

- British Dietetic Association
- Association for Nutrition
- Food Standards Agency
- Department of Health



Role boundaries

Scope of practice

- Provide information using published guidance from credible sources
- Not providing information based on personal opinion or experience
- Not providing information that constitutes nutrition therapy or treatment of a nutrient deficiency
- Not providing information to clients with medical conditions who require individual dietary advice
- Not providing advice or recommendations for dietary supplements



Role boundaries

When to refer to GP or healthcare professionals:

- Health care professionals – registered dietician, registered nutritionist

Reasons for referral

- Chronic health conditions, for example, severe obesity, diabetes, allergies, coeliac, heart disease
- Malnutrition including vitamin and mineral deficiencies
- Underweight
- Eating disorders
- Requests for specific meal plans or advice on dietary supplements



Accessing reliable information

- Public Health England
- National Food Guide
- Food Standards Agency (FSA)
- Eatwell guide
- Government Department of Health (DoH)





USP184 - Exercise, fitness and lifestyle consultation and management

LO5 Know how to consult with clients to support and motivate lifestyle behaviour change and exercise adherence
LO6 Be able to consult with clients to support and motivate lifestyle behaviour change and exercise adherence

Content and Assessment Criteria

- Know how to consult with clients and develop effective working relationships
- Know the scope of practice and role boundaries in relation to providing health and wellbeing advice
- Know how different lifestyle behaviours affect health and wellbeing
- Know the different stages of change and motivational strategies to support clients
- Be able to consult with clients to support and motivate lifestyle behaviour change and exercise adherence



The consultation area

How to prepare the consultation area:

- Private and no distractions
- Clean and tidy
- Comfortable setting
- Remove any obstacles and barriers
- All paperwork and resources ready



Structure and communication

How to use communication skills and structure the consultation:

- Begin consultation and initiate conversation
- Greet client
- Introduce self
- Clarify role and boundaries
- Encourage client to speak openly (using open-ended questions), use follow-up questions (probing) where appropriate



Structure and communication

Maintain conversation and rapport and reflect empathy:

- Using active listening
- Affirming statements
- Reflective statements
- Appropriate non-verbal communications, for example, body position, posture, gestures, facial expressions
- Summaries to help progress the conversation



Structure and communication

Facilitate goal-setting:

- Determine client readiness to set goals in relation to a specific lifestyle behaviour, for example, use of questionnaires and rating scales, assess balance of change and sustain talk, confidence scales
- Explain the process of goal setting, action planning and reviews
- Assist the client with SMART goal setting (process and outcome goals)
- Help clients to identify any personal barriers to making lifestyle changes and their personal suggestions and strategies for managing these barriers



Structure and communication

Close the consultation:

- Discuss the benefits of making changes and reviewing progress against agreed targets
- Provide affirmations, encouragement to the client
- Negotiate action plan
- Ensure the client is satisfied with the agreed action plan
- Discuss communication and support strategies between sessions, including social support available to the client
- Book next meeting/appointment



Communication skills

In pairs discuss the following and how they can affect the consultation process:

- Code of ethics
- Customer needs
- Effective working relationships
- Effective communication skills
 - Verbal
 - Non-verbal
 - Styles



Verbal questions – consultation

- Conversational approach
- Builds rapport – can get to know client
- Can probe and ask for more information
- Can observe body language
- Need effective conversation and questioning skills
- Need to listen
- Need to record information
- Need to maintain confidentiality
- Need private area for consultations



Professional boundaries

- Respect clients
- Be empathic and non-judgmental when discussing diet and eating behaviours
- Work within your scope of practice
- Understand the role of other professionals (see other professionals slide for examples)



Informed consent

- Essential requirement prior to any assessments or advice and programming
- Signed and dated record
- Legal record, should be checked by legal professionals
- **To give consent, clients need to be fully informed!**



Informed consent

- The purpose of the assessment or guidance
- An outline of what will happen and reasons
- The benefits and any potential risks
- What the instructor has done or will do to ensure safety, for example, PAR-Q
- Any discomforts the client may experience, for example, feel hot and sweaty during exercise
- The client responsibilities, for example, what they need to tell you
- Explanation that participation is voluntary
- Confidentiality and privacy statement
- The opportunity for the client to ask questions
- A record of all questions asked and answers
- Client and instructor signature and date



Other professionals

- Signpost to GP
- GP will refer to other services:
 - Exercise referral
 - Dietitian
 - Physiotherapist
 - Smoking cessation
 - Alcohol service
 - Health checks, practice nurse



Factors affecting health and wellbeing

- Physical activity/inactivity
- Smoking
- Alcohol use/misuse
- Eating habits
- Sleep patterns



Physical **inactivity**

Being inactive can lead to the development of many chronic health conditions, including:

- Cardiovascular disease
(stroke, angina, coronary heart disease, high blood pressure)
- Obesity and diabetes
- Stress, anxiety and depression
- Osteoporosis
- Low back pain
- Some cancers



Physical activity

- Reduce the risk of developing coronary heart disease (CHD), stroke, diabetes and some cancers
- Reduce stress and anxiety
- Reduce the risk of depression
- Reduce the risk of osteoporosis
- Reduce the risk of falls in older adults
- Improve quality of life and general wellbeing
- Assist weight loss and weight management
- Reduce the risk of obesity

(Department of Health, 2011)



Smoking

Long term effects include:

- Lung cancer
- Chronic Obstructive Pulmonary Disease (COPD)
- Dementia and Alzheimer's disease
- Coronary Heart Disease (CHD)
- Stroke
- Osteoporosis
- Peripheral Artery Disease (PAD)
- Mouth and throat cancers
- During pregnancy – risk of miscarriage, low birth weight baby and experiencing complications during labour



Alcohol use/misuse

Responsible guidelines:

- 14 units a week maximum for men and women
- At least 2 alcohol free days per week
- Not exceeding maximum units
- Avoid binge drinking, for example, all units in one go



Risks of harmful drinking

- Cardiovascular disease (coronary heart disease and stroke)
- Cirrhosis of the liver
- Cancer – mouth, throat, liver, breast
- Weight gain
- Depression and anxiety
- Alcohol dependence or addiction
- Pancreatitis
- Osteoporosis
- Stomach ulcers



The importance of healthy eating

- Maintain health
- Protection from chronic health conditions
- Improve performance
- Growth and repair of tissues – healthy development
- Weight management
- Mental well being
- General well being
- Boost immunity



The risks of poor nutrition

- Cardiovascular disease – stroke, hypertension, high cholesterol, coronary heart disease
- Obesity
- Some cancers
- Diabetes
- Asthma
- Eczema
- Constipation
- Gout



Sleeping patterns

Sleeping

Essential for survival and health, maintenance of brain function, recovery and restoration of all body systems, supports mental and physical health.

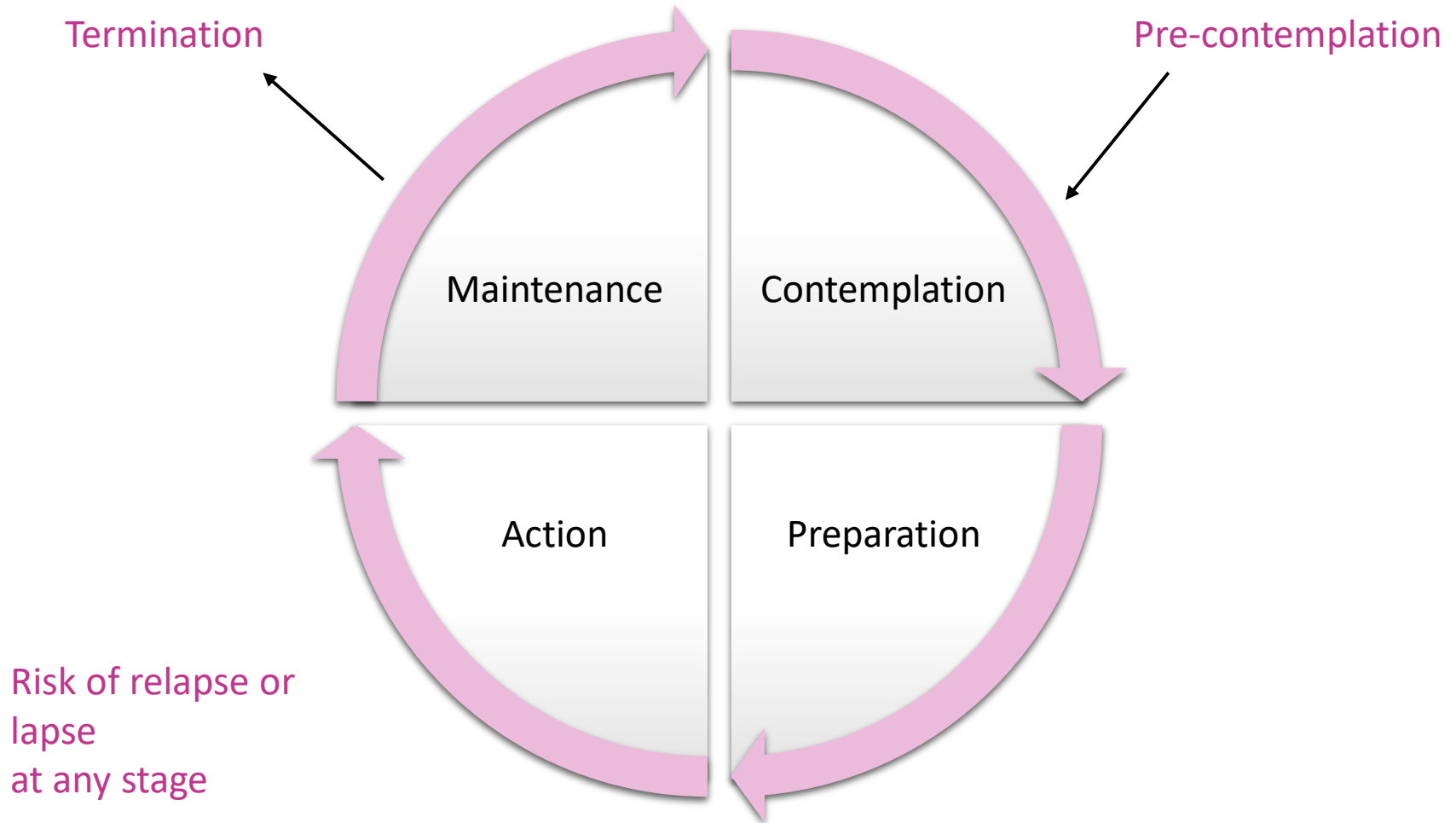


Activity

-
- What factors can affect sleep or contribute to poor sleep?



Trans theoretical model

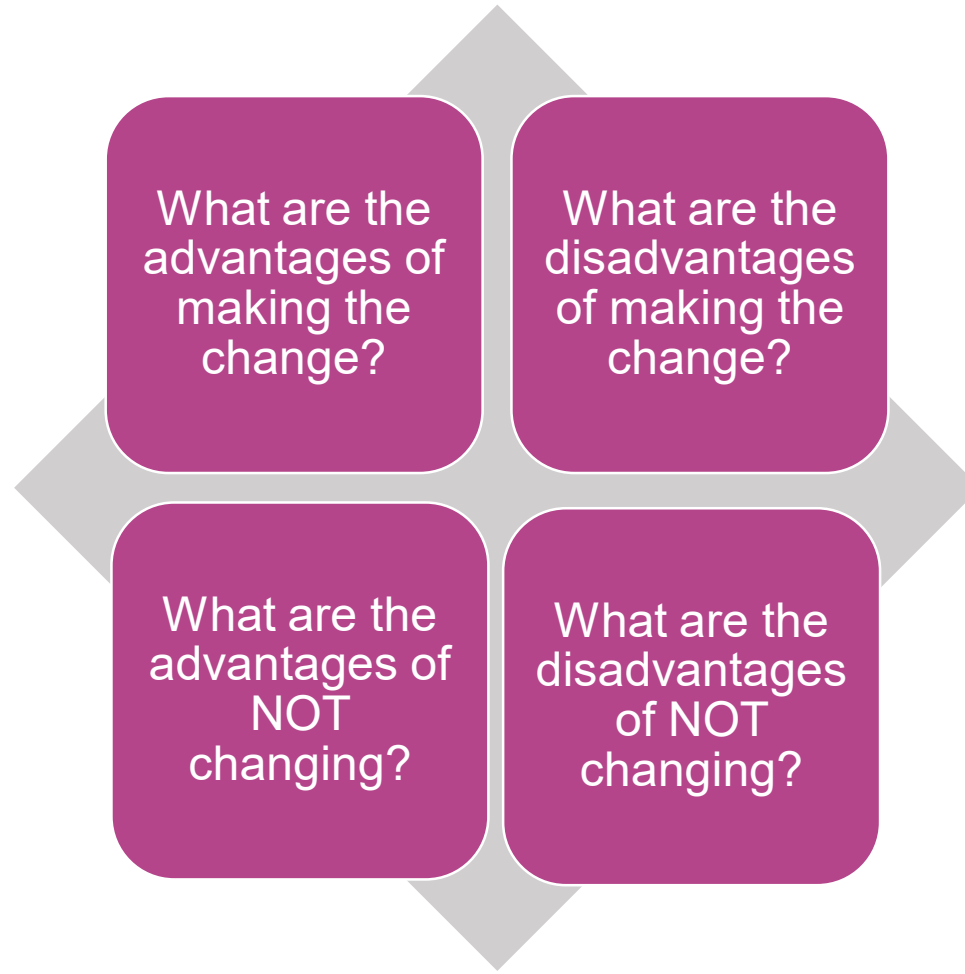


Behaviour change approaches

- **Pre-contemplation** – not considering change
- **Contemplation** – thinking about making a change – next six months
- **Preparation** – already preparing to make changes
- **Action** – changes started and sustained for up to six months
- **Maintenance** – changes made and sustained for beyond six months
- **Lapse** – a minor lapse back to old behaviour, can happen anytime
- **Relapse** – return to old behaviour, can happen anytime
- **Termination** – permanent change



Decisional balance



Factors influencing change

- **Personal motivation:**
 - How much someone wants something
- **Self-efficacy:**
 - How the person perceives the task – difficult or easy
- **The support resources available:**
 - **Inner resources**
Emotional intelligence, positive mental attitude, physical fitness
 - **External resources**
Support of friends, family or financial resources



Intrinsic and extrinsic motivators for change

Intrinsic

- Self-esteem
- Confidence
- Personality traits
- Lack of motivation

Extrinsic

- Family
- Work



Strategies to support clients and build motivation

- Inclusion and engagement with decision making
- Active listening, for example, explore barriers and motivation

Many different behaviour change approaches and strategies, including:

- Motivational interviewing – change and sustain talk
- Person centred helping – core conditions
- Trans theoretical model – stages and processes
 - Decisional balance
 - Psychological readiness
 - SMART goal setting



Motivational interviewing

The key principles:

- Person centered foundations
- People have all the resources they need inside
- The helping relationship helps them to find their resources
- Conversations are facilitated so that people talk themselves into change
- Ambivalence is natural. It is a helpful part of the change process, it is a step towards making a change
- Individuals are most likely to be persuaded and motivated by themselves and what they say to themselves (their inner self-talk)

Source: Rollnick and Miller (2013)



Motivational interviewing

The core skills:

O — Open questions

A — Affirming statements

R — Reflective listening

S — Summarising



Strategies to overcome barriers

- Use **motivational interviewing** to build motivation
- Listen to explore barriers and motivations
 - **Barriers** – reasons for not doing something (**sustain talk**)
 - **Motivations** – reasons for doing something (**change talk**)
- Ask them to summarise the benefits of making a change
- Ask them for their ideas on overcoming barriers
- Summarise and praise all ideas they suggest
- Ask how they would feel if they managed to overcome a barrier
- Ask them what they perceive to be the benefits of overcoming a barrier?
- Let them make their own decision
- Avoid telling them how they can do it



Supporting clients

- Rapport, relationship, respect
- Non-judgment
- Positive – be hopeful for client's success, believe in potential
- Support and motivation for example, trainer and build support systems (family and friends)
- Build autonomy – client involved in choices and decisions
- Client centred approach:
 - **Empathy** – see things from client's perspective
 - **Positive regard** – accept, respect and value, without judgment
 - **Congruence** – genuineness, behave in accordance with values



Strategies to build motivation

- Rewards – praise and encouragement
- Incentives
- Social support
- SMART goal setting
- Positive affirmations and self-talk
- Relapse prevention strategies



What factors contribute to adopting lifestyle behaviours

- Role models
- Rebellion
- Peer pressure
- Socioeconomic factors
- Personal reasons



What positively and negatively affect adherence to behaviour change?

Positive:

- Motivational
- Enjoyment
- Social support
- Autonomy of tasks
- Mastery of tasks
- Sense of belonging
- Tangible health benefits



What positively and negatively affects adherence to behaviour change?

Negative:

- Addiction
- Cravings
- Withdrawal symptoms
- Lack of support
- Presence of sabotaging relationships
- Sociopsychological issues



SMART goals

S – Specific, for example, use an active verb

M – Measurable, for example, frequency or volume

A – Achievable, for example, is it realistically within the client's potential?

R – Relevant, for example, matches client objectives?

T – Time-bound, for example, date of achievement stated



Goals

Short-term	One day to one month
Medium-term	One month to six months
Long-term	Six months to several years



Reviewing Goals

- Regular reviews
- Consult client
- Monitor progress
- Revise to meet needs
- Goal completed early
- Goal not completed
- Lapse or relapse





Activity

Consultation skills task – In groups of three take turns to complete a full consultation with a group member. One person should carry out the consultation, one person should be the client and the third person observes the whole process and provides feedback. Take it in turns and rotate for each role.

Consider:

- Documentation that should be used
- Creating a positive, motivating and empowering environment
- Collecting and assessing all the required information
- Setting appropriate goals and ongoing support

