

Assessing Health & Functional Fitness

Lecture 3 – Introduction to Fitness Assessment and Contraindications



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Conducting Fitness Assessments

Today's Gobbletoon By Dan Gibson



Fitness Assessment

- Why do we want to assess?
- How do we assess?
- What does the information mean?
- How can the information be used?

Benefits of Exercise

- Reduce the risk of premature death
- Reduce the risk of developing and/or dying from heart disease
- Reduce high blood pressure or the risk of developing high blood pressure
- Reduce high cholesterol or the risk of developing high cholesterol
- Reduce the risk of developing colon cancer and breast cancer
- Reduce the risk of developing diabetes
- Reduce or maintain body weight or body fat
- Build and maintain healthy muscles, bones, and joints
- Reduce depression and anxiety
- Improve psychological well-being
- Enhanced work, recreation, and sport performance
- Etc, etc.

Contra-indications to exercise

Most people will benefit from some level of exercise but some people will need special attention or referral from a medical professional;

Cardiovascular disease

Injuries

Stroke

Epilepsy / fainting

Diabetes

Pregnancy

Asthma / pulmonary disease

Hypertension

Rheumatoid arthritis

Osteoporosis

Obesity

Mental health

Cancer

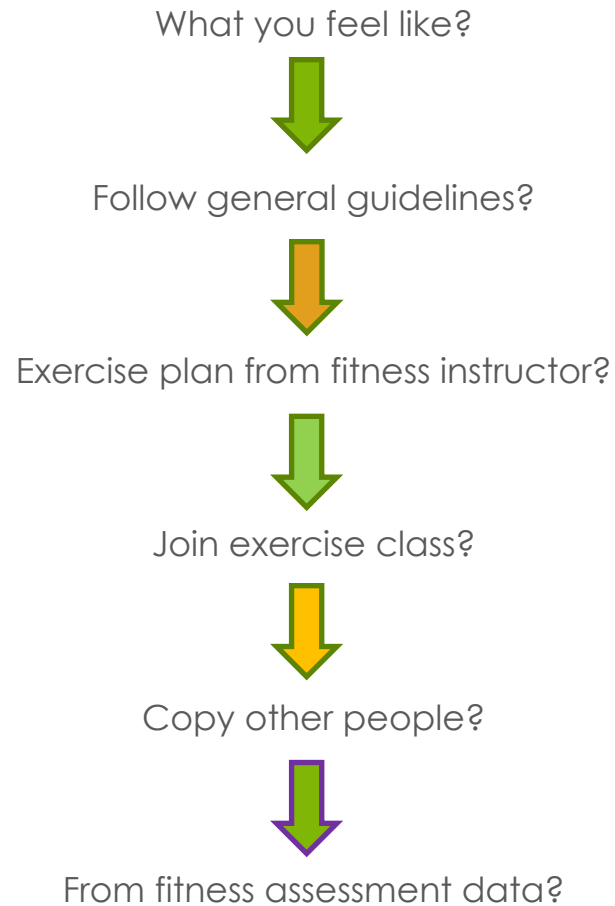
Fitness Tests

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Fitness Assessments

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Exercise Prescription



Fitness Assessment

Gives an objective set of information from which to base a training programme.

Why Conduct An Assessment

- Establish current physical capacities
- Monitor changes in capacity
- Determine areas for training
- Determine issues that may affect training
- Motivation in training
- Establish 'norm' or reference values

A Diagnostic Tool

The data is used to prescribe exercise but;

- You are not qualified to diagnose any medical condition.
- You can indicate a predisposition to a condition.
- You should refer a client to a medical professional for diagnosis if you suspect any condition that may be aggravated by exercise.

How do we Assess?

□ Pre-assessment information

- Lifestyle?
- Medical?

□ Selection of assessments

- Needs or activity analysis

□ Protocols

- Validity
- Reliability
- Reproducibility
- Accuracy
- Sensitivity
- Techniques

□ Other factors

- Equipment
- Environment
- Health and Safety Issues

What does the information mean?

- Comparison to norms
 - Actual data
 - Mathematical manipulations
- Comparison to previous data
 - Actual data
 - Mathematical manipulations

How is the information used?

- Design training programmes
- Monitor and Adjust training programmes
- Limit training and exercise
- Referral to other exercise or medical professionals.
- Job and team selection
- Others?

Fitness Tests/ Assessments

- Blood Pressure
- FEV(1), FVC, PF
- Height & Weight
- Astrand Sub-maximal VO2
- Durnin and Wormersley 4-site skinfold test
- Modified Sit and Reach
- Handgrip & Leg/Back Dynamometer
- Maximal Vertical Jump

Contra-indications to exercise

“ Those who think they have no time for bodily exercise will sooner or later have to find time for illness.”

Edward Stanley

However it may be that for people with certain medical and or lifestyle conditions exercise may be contra-indicated i.e. potentially cause problems or aggravate an illness

Exercise and Disease

For 'healthy normal' people exercise prescription is fairly straight forward. However many people in our society are suffering from illness or disease.

Diagnostic Tools

Pre-diagnosed conditions

- ▣ Medical questionnaire
- ▣ Lifestyle questionnaire

Un-diagnosed conditions

- ▣ Assessment of blood pressure
- ▣ Assessment of lung capacities
- ▣ Assessment of body composition

Other Factors

- ▣ Lifestyle questionnaire
- ▣ Discussion

- You are not qualified to diagnose any medical condition!
- You can indicate a predisposition to a condition
- You should refer a client to a medical professional for diagnosis if you suspect any condition that may be aggravated by exercise.

Pre-diagnosed conditions

Medical

- ▣ Cardiovascular disease
- ▣ Hypertension
- ▣ Injuries
- ▣ Rheumatoid arthritis
- ▣ Stroke
- ▣ Osteoporosis
- ▣ Epilepsy / fainting / blackouts
- ▣ Obesity
- ▣ Diabetes
- ▣ Asthma / pulmonary disease
- ▣ Mental health

Pre-diagnosed conditions

Lifestyle

- Smoking
- Alcohol
- Stress
- Inactivity
- Dietary

Pre-diagnosed conditions other?

- Age
- Pregnancy
- Gender

Cardiovascular Disease

Contraindications

1. Unstable angina
2. Resting SBP >200mmHg or DBP >110mmHg
3. Acute systemic illness or fever
4. Resting heart rate >120b/min
5. Recent embolism
6. Uncontrolled diabetes
7. Severe orthopaedic problems
8. Metabolic problems

Cardiovascular disease

- To diminish the cardiovascular stress at any given level of activity and thereby reduce the likelihood of further cardiovascular incidence
- Type
 - isotonic forms using large muscle groups e.g. Walking, swimming or cycling if overweight, light weight
- Duration and frequency
 - start 20 mins x 3/wk
 - progress 40-60 mins x 5/wk
- Intensity
 - start 45% progress to up to 90% VO_2 max over a period of time, as comfortable / confident.
 - VO_2 max / + 20bts/min above resting HR.

Hypertension

- Contraindications – as for CHD
- Exercise increases the resting vasodilation tone of arterial blood vessels.
- Mediates other factors such as diabetes and obesity associated with hypertension.
- Exercise – Moderate intensity for 30-45 mins every day. i.e. walking.

Avoid high intensity isometric activities.

Injuries

- ❑ Consult with primary treatment advisor i.e. Sports therapist/ Physio/ Other health professional
- ❑ Contraindications are those related to the healing mechanism and associated timeline.
- ❑ Work muscles not affected by injury.
- ❑ Progress rehabilitation as injury heals – slowly!
- ❑ Provide additional advice to speed up healing i.e. Hot / cold therapy.
- ❑ Provide psychological support.

Rheumatoid Arthritis

- Aggravation of soft tissues leading to stiffness and deterioration of these tissues (1-2% of the population)
- Exercise does not seem to aggravate the condition and there are significant benefits, though generally avoid impact activities.
- Exercise reduced pain by increasing circulating endorphins.
- Stretching exercise 2-3 time/day
- Exercise prevents loss of other physical function
- During flares concentrate on static forms of exercise in affected joints
- Intensity depends on the level of training start 15 mins x 3/wk progress as client's fitness improves,
- Cycling and swimming advised for aerobic forms of exercise

Stroke

- Be advised by medical consultation!
- See also cardiovascular disease.
- Exercise (aerobic) reduces potential of stroke reoccurrence by;
 - Reduction of plasma fibrinogen
 - Increases dilatory tone in blood vessels
 - Reduces blood factors associated with stroke such as
 - Adherence of monocytes
 - Aggregation of platelets

Stroke

- For Motor control (early stage)

activities to replicate real actions seem to be as if not more effective than specific training i.e. walking on treadmill (supported if necessary).

- Strength training

Muscular tone improves with specific exercise aiding motor control. Intensity and weights as appropriate

- Aerobic training

Prevents deconditioning and associated conditions

Benefits of exercise and stroke is equivocal and care must be taken when advising in a non-clinical environment. Seek explicit medical advice.

Osteoporosis

Deterioration of bone tissue with increased susceptibility to fracture

- Weight bearing physical activity is essential
- Muscular training activities may also be beneficial
- Exercise for developing bone seems more responsive
- Excessive endurance training may induce hormonal changes that adversely affect bone density.
- Although helpful, exercise may not be sufficient to off-set bone degeneration, hormone replacement and nutritional supplementation may be required e.g. calcium.
- Activities which promote improvements in strength, flexibility and coordination may reduce the likelihood of falling and thus are optimal for older people.

Most beneficial type, intensity and duration of exercise still to be identified

Epilepsy / fainting / blackouts

- Seek medical advice
- Any form of activity is suitable
- Avoid exhaustive exercise
- Avoid exercise in hot climates
- Ensure proper hydration
- Avoid exercising on treadmill

Obesity

- Best to use a combination of diet and exercise.
- Aerobic exercise to increase calorific use
- Start at intensity and duration capable of by client and increase as appropriate
- Avoid impact activities; cycling, walking and swimming best.
- Strength training as for normal person

Diabetes

Type I diabetes

- Comprehensive medical screening and confirmation from specialist.
- If so then any form of exercise can be tolerated.
- Benefits as associated with normal population
- Improvements in blood glucose to insulin sensitivity.
- Increase accumulation of ketones
- Risks to those exercising
 - Hypoglycaemia
 - Hyperglycaemia
 - Aggravation of CHD inc. sudden death
 - Worsening of long term complications of diabetes
- Monitor effects of exercise especially concerning hypoglycaemia.

Diabetes

- Type II diabetes
- Medical evaluation required prior to exercise.
- Exercise increases insulin sensitivity and may result in reduced need for medication. This effect lasts 5-7 days.
- Minimum of 30 mins 5wk at moderate –high intensity.
- Warm-up vital 5-10 mins at low –mod intensity.
- Monitor response to exercise and have food available if required.

Asthma

- ▣ Seek medical advice
- ▣ Make sure medication is available at all times
- ▣ Improvements to training similar to normal people unless condition is chronic (no discussed here – avoid this group).

Training increases function of;

Ventilator muscles – strength and endurance

Peak flow

VO₂ efficiency

Maximal sustained ventilation

Mental Health

General exercise can have the following effects on mental health

- Anxiety improved
- Depression reduced
- Mood state improved
- Neurobehaviour improved
- Self-efficacy improved
- Quality of life perception improved
- Cognition improved
- Neuroticism reduced
- Reduced stress emotions

Mental Health

- ❑ Placebo effect? – probably partially
- ❑ Aerobic exercise probably better than meditation, psychotherapy and weight training.
- ❑ Duration, intensity and type dependent on individual
- ❑ Generally $>70\%$ VO_2max .
- ❑ Those receiving medication require close medical supervision

Conclusions

- Generally those with specific conditions can be provided with an exercise programme – but not all.
- You must make sure that the risks are minimised and consult with medical specialist prior to prescribing a programme.
- There are significant health benefits for those with medical conditions associated with regular exercise and these people must be provided for.