Promoting physical activity in Pacific Island communities

Workshop manual

GET ACTIVE!

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By

Secretariat of the Pacific Community and Russell Consulting International

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Contents

Introduction

Pacific Islanders were traditionally fit and active. Their lifestyle included many activities like farming, walking, fishing and other manual tasks every day. Today many Pacific Islanders – particularly those in urban areas – lead almost sedentary lives. Cars, motorboats, buses and motorbikes reduce the need to walk; many people are employed in office jobs where they sit all day; and many spend their free time watching television. Additionally, prepared foods are readily available from stores, meaning that we no longer need to farm and fish to eat.

Evidence shows that physically inactive people have a greater risk of developing health problems such as high blood pressure, high blood lipids (such as cholesterol), insulin resistance, diabetes, heart disease, stroke, gout and obesity.

In addition to the decrease in physical activity levels, there have been other changes in our lifestyle. These include modifications in our diets and greater use of alcohol and tobacco. These changes also negatively affect our health, and unless lifestyles begin to improve, incidences of health problems like diabetes and heart disease will continue to grow.

Countries in this region are increasingly recognising the importance of physical activity to health, and efforts are being made at the community level to help people be more physically active. The educators and health professionals who have the responsibility of supporting and advising communities and individuals on increasing their activity levels often have only limited knowledge of how to do this. Resources and guidelines from outside the region are generally of limited value, with few that are relevant for Islanders.

In response to this need and to requests from nutritionists at a regional conference in 2003, the Healthy Pacific Lifestyle Section of the Secretariat of the Pacific Community (SPC) contracted Professor David Russell to develop course materials to support a one-week workshop for health educators and promoters. These materials were piloted in a sub-regional workshop held in 2004, and were subsequently used in two sub-regional workshops in 2005. Following these workshops and their evaluation, it was agreed to produce a manual that could be distributed around the region and could potentially support in-country training.

Additional resources

Supporting materials, including fact sheets and posters, are available from SPC on request, and some can be downloaded from our website (http://www.spc.int/hpl). It is recommended that any local guidelines, strategies or plans on physical activity also be used.

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Acknowledgements

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About this manual

This manual was initially developed to support the delivery of workshops held in 2004 and 2005. It has since evolved and it is hoped that this more comprehensive version can be used by as a refresher for the participants in the previous workshops.

For convenience and a reference, the programme for the workshop held from 28 November to 2 December 2005 is provided as Appendix 1.

It is hoped that the manual can also be used as the basis for delivering training within countries. The entire training programme takes a full week, but the individual sessions may be used independently, or the training can be spread over several weeks. Further information and advice can be obtained from SPC.

The purpose of the materials and training is not to produce athletes or aerobics instructors, but to help participants be more effective at promoting a more physically active lifestyle in their local communities.

In keeping with adult education principles and philosophy, the training programme is designed in an interactive and dynamic style. Its strategies include questioning techniques, demonstrations, role-plays, case studies and hands-on practice to involve participants directly and actively in the learning process. The following symbol is used to show when participants are expected to undertake a task or activity.

The details of each task are provided in the accompagnying workbook.

Suggestions for workshop delivery

A suitable setting for the workshop is very important. The setting should be supportive of physical activity. Basic equipment will be needed for some sessions.

Suggested group size

The ideal size for the workshop is no more than 10 participants (if there is only one facilitator). It is preferable for participants to share similar levels of knowledge, fitness, current activity and experience.

Running a healthy workshop

It is important that the workshop is conducted in a healthy environment. For example:

- the training room or environment should be smoke-free;
- no alcohol or kava should be provided or consumed during the day;
- healthy snacks or meals, with minimal added fat, sugar and salt (see below), should be served in appropriate portions;
- sugar-free drinks, fresh drinking coconuts or unsweetened fruit juices should be available; and
- clean drinking water should be readily available.

Suitable snacks include:

- any type of fresh fruit;
- chunks of carrot, cucumber, under-ripe papaya and/or tomato;
- sandwiches made with wholemeal bread (if possible), salad and a small amount of lean meat, fish or cheese – no mayonnaise and not too much margarine/butter;

- wholemeal bread or toast with peanut butter;
- cold pieces of taro (which can be topped with a piece of fish or meat or a slice of tomato); and
- cold pieces of cooked sweet potato or cooking banana.

Suggested aim and objectives for workshop

Aim

To enhance the knowledge, practical skills and attitudes of health promoters to enable them to promote physical activity more effectively and safely as an important strategy for the prevention of non-communicable diseases (NCDs).

Objectives

At the end of the workshop, the participants should have:

- improved knowledge and techniques for promoting physical activity for health in their countries; and
- enhanced practical skills in providing appropriate support to at-risk individuals/groups for physical activity programmes that are safe.

Physical activity practical components

It is recommended that every day include at least two sessions in which participants experience physical activity. These can be used to enhance the skills of participants in recommending more activity and also reinforce the learning experiences. The practical sessions should take 20–45 minutes, and all participants should take part (those who are less fit can work at a slower pace than those who are more fit). Some examples:

- walking circuits, e.g. around the workshop venue (the first circuit can be done slowly, the second one faster to increase the breathing rate)
- buddy walks – as above, but talking to someone (with questions provided) so that breathing is used as an indicator of exertion levels
- aerobics
- walking or running circuits in the workshop room using some basic materials, e.g. skipping rope, using full water bottles (for arm exercises)
- beach/pool for water-based activities, e.g. walking in water, bending and stretching activities
- volleyball
- basketball
- dancing (any type)

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Session 1: Introduction to physical activity and health

Aim of session:

To achieve a basic understanding of physical activity and its relationship with health

Outline:

1. What is physical activity?
2. What happens when we are more physically active?
3. Is physical activity good for us?
4. What are the health benefits of physical activity?
5. What are some of the costs of physical inactivity?
6. How much physical activity do we need for health?

Recommended time: 45–60 minutes

1. What is physical activity?

Simply put, physical activity is any movement made by the body. It includes the everyday things we do that involve moving around at home, at work and in our leisure time.

Physical activity can be described in several terms:

- Where we do it – *location*
- What we do – *type*
- How much time we spend on it – *duration*
- How often we do it – *frequency*
- How physically demanding it is – *intensity*

As we will see in Session 3, the health benefits of physical activity depend on the last three of these: frequency, duration and intensity.

An individual who is inactive is said to lead a sedentary life. Thus, we can describe people based on how active or sedentary they are.

2. What happens when we are more physically active?

Increasing physical activity levels can have the following effects:

- It uses up the bodies stores of fat, and can reduce weight.
- It increases muscle mass (note that if muscle is gained and fat is lost, weight loss may not occur immediately).
- It changes body shape – physical activity can burn fat and increase muscle mass, which can reduce waist measurement.

Calories in food > Calories used = Weight gain

Calories in food < Calories used = Weight loss

Calories in food = Calories used = Weight control

3. Is physical activity good for us?

With very few exceptions, everyone benefits from being physically active. For most people, being even moderately more active than they are at present will help make them healthier.

4. What are the health benefits of physical activity?

People who remain physically active are generally healthier. They:

- have a reduced risk of developing NCDs (and are better able to control NCDs if they already have them);
- can better control their weight;
- feel better and benefit from improved appearance and self-esteem;
- can manage their everyday activities without fatigue; and
- have increased mobility, which they maintain into old age.

Here are some specific effects of physical activity and how they work.

Effects of physical activity on selected NCDs and other conditions

Physical activity effects	Disease/condition affected
Improved blood lipid profile: ▪ ↑ HDL ('good' cholesterol) ▪ ↓ LDL ('bad' cholesterol) ▪ ↓ Total cholesterol ▪ ↓ Triglycerides ↓ Blood clotting ↓ Blood pressure	Reduces risk of cardiovascular disease
↓ Blood glucose ↑ Insulin sensitivity ↓ Central obesity	Reduces risk of developing type 2 diabetes
↓ Colon transit time (mechanism unclear)	Reduces risk of: ▪ colon cancer ▪ breast cancer
↑ Bone mineral density (BMD) in youth ↓ BMD loss with ageing Improves muscle strength and posture	Reduces risk of osteoporosis and broken bones, especially from falls
↑Energy needs of body	Helps control weight
Improves mental health	Reduces: ▪ anxiety ▪ depression

5. What are some of the costs of physical inactivity?

Economic analyses show that the physical inactivity of the population costs a country like New Zealand about NZD 200 million per year and the USA about USD 75 billion per year. Physically inactive people are more likely to develop health problems.

- Sick people cost money – health-care costs, days off work, early death of productive workers.
- A reduced disease burden has economic benefits.

6. How much physical activity do we need for health?

Research shows that being active on a daily basis is the best way to maintain and/or improve health. Most of these benefits can be gained from engaging in a total of 30 minutes of moderate activity each day. Weight loss, however, seems to require about 60 minutes a day (WHO 2003). These are the ideal levels, and it should be remembered that any slight increase in a person's physical activity level can benefit their health even if they do not reach these targets.

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Session 2: Basic concepts of physical activity

Aims of session:

- To achieve an understanding of the basic concepts of physical activity and physical fitness and the difference between health- and performance-related physical fitness
- To understand the practical implications of the use of the formal technical descriptions of these terms in the context of public health promotion

Outline:

1. What is physical activity?
2. What is exercise?
3. What is physical fitness?
4. Health- and performance-related fitness

Recommended time: *1 hour (+ 1 hour for tasks)*

1. What is physical activity?

Physical activity is defined as any movements produced by skeletal muscles that result in significant energy expenditure.

2. What is exercise?

When someone is physically active for the purpose of improving fitness and health, the activity is technically known as exercise.

Exercise is defined as planned, structured and repetitive bodily movement done to improve or maintain one or more components of physical fitness.

(The components of physical fitness are described below.)

The reason people 'exercise' varies – for example, they may exercise to improve their capacity to do work, control their weight, improve their body image or feel good, or for enjoyment.

Health promoters who work with inactive groups tend to use the term activity rather than exercise. This is because, to many people, especially inactive people, exercising is something they associate with slim people sweating in expensive aerobics clothing – a daunting prospect!

So, in this workshop, the practical component will emphasise informal, moderate-intensity physical activity designed to be achievable and non-threatening. This type of activity is best suited to the very large proportion of our communities that is inactive. As previously mentioned, this manual is not focused on training athletes.

3. What is physical fitness?

Physical fitness is defined as the capacity to perform physical activity. In other words, you are able to do a required activity without having to give up!

We can imagine that different things may make us need to 'give up', e.g. bags that we have to carry are too heavy, our breathing becomes laboured, we can't bend far enough to tie up our shoelaces.

These factors make up the components of physical fitness:

- *cardio-respiratory endurance* – the ability of the circulatory and respiratory systems to supply sufficient oxygen during sustained physical activity
- *skeletal muscular endurance* – the ability of skeletal muscle to continue to perform without fatigue
- *skeletal muscular strength* – the ability of skeletal muscle to exert force
- *skeletal muscular power* – the rate at which one can perform work
- *speed* – the ability to perform a movement within a short period of time
- *flexibility* – the range of motion of a joint
- *agility* – the ability to change the position of the body in space with speed and accuracy
- *balance* – the ability to maintain equilibrium while in motion or at rest
- *reaction time* – the delay in moving after the occurrence of a stimulus

Our personal physical fitness requirements depend on the normal demands of our lifestyle. Ideally, we should have sufficient fitness to meet these demands with some left over to meet common emergencies! For example, an office worker may have difficulty catching a runaway pig.

4. Health- and performance-related fitness

It is important to understand the difference between performance- and health-related fitness.

Performance-related fitness refers to the capacity of an individual to perform at their absolute maximum possible level – for example, to lift the absolute maximum weight or to run the fastest 100 metres they are capable of. In simple terms, it refers to maximum fitness for sporting activities.

On the other hand, health-related fitness means being sufficiently active to derive health benefits – for example, to maintain a healthy body weight and to maintain optimal heart and lung function.

The following table identifies the fitness components relevant to these two types of fitness.

Health-related fitness	Performance-related fitness
Cardio-respiratory	Speed
Muscular endurance	Muscular power
Muscular strength	Agility
Flexibility	Balance
Coordination	Reaction time

Task 2.1 Physical activity terminology – *Refer to workshop workbook, Session 2*

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Session 3: Physical activity components

Aim of session:

To review different components of physical activity: aerobic, strength, flexibility

Outline:

1. Aerobic component
2. Strength component
3. Flexibility component
4. Improving endurance, strength, balance and flexibility

Recommended time: *1 hour (+ 1 hour for tasks)*

1. Aerobic component

The aerobic component is probably the most important health-related aspect of an activity programme.

Aerobic activities refer to those activities that require oxygen for metabolism. They are different from anaerobic activities, which produce energy for the muscles without the direct use of oxygen.

An example of an aerobic activity is raking the leaves – the oxygen demands of the activity are no greater than our capacity to supply it.

Performing aerobic activity increases our endurance – that is, it allows us to do activities for longer and with less effort.

An example of an anaerobic activity is a 100-metre sprint. A 12-second 100 m run requires 6 litres of oxygen. The amount of oxygen that can be delivered to the muscles is 1.2 litres. The energy provided to your muscles must be provided anaerobically (through the process of glycolysis). This oxygen debt of 4.8 litres is repaid after the race through your heavy breathing.

(We will not be dealing with anaerobic activities in this manual.)

2. Strength component

Activities that improve strength, even modestly, are beneficial throughout life.

Simply put, we all need sufficient strength to meet not only the everyday needs of our lifestyle, but also the inevitable 'emergencies' we face – whether carrying an overweight suitcase or lifting a small child.

Strength naturally declines with age. Hence, people who lack good strength levels when they are young will have difficulty with certain tasks as they age – for example, getting up from a chair unaided, opening a jar, or climbing the stairs. So it is important to practice strength-building activities throughout life.

Strength-building activities don't mean just lifting weights (in fact, unless you have specific expertise in weight training it is best to avoid this approach). There are plenty of alternatives. Try to include activities that ensure all parts of the body get a workout. For example, if you mainly walk, build up your arm strength by lifting objects or carrying things. If you mainly paddle, try to add in some walking or cycling to increase your lower body strength.

3. Flexibility component

Flexibility makes many everyday tasks easier, and can prevent injury when we are forced to bend or stretch in an unusual direction.

Flexibility training is a worthwhile addition to any activity programme.

Recommendation

Practical ways to increase flexibility are described in the workbook. It is not necessary to do flexibility training done daily, although it is ideal to do so. The US President's Council on Physical Fitness (PCPF) makes the recommendations in the following table.

	Recommendation for flexibility
Frequency	At least 3 times a week, preferably daily and after moderate or vigorous physical activity
Intensity	Slowly elongate muscle and hold with low levels of force
Duration	Up to 4–5 stretches held for 15–30 seconds

Adapted from PCPF Research Digest Series 3 No. 10, June 2000

Some points to remember:

- Include stretching during any cool-down phase – but only for those joints whose muscles have been thoroughly warmed.
- Avoid any joint stretching (to increase flexibility) before your muscles are warm, especially during warm-up for more vigorous activity.
- Gentle stretching of the muscles during warm-up is all right – but do not overstretch or bounce.

4. Improving endurance, strength, balance and flexibility[1]

Examples of activities designed to improve aerobic endurance, strength and flexibility are described in Appendix 8. For each activity, suggestions are made about frequency and duration, safety issues and how to increase your level.

Task 3.1 Endurance, strength, balance and flexibility activities – *Refer to workshop workbook, Session 3*

[1] Extracted from Exercise: A Guide from the National Institute on Aging and the National Aeronautics and Space Administration (USA). <http://weboflife.ksc.nasa.gov/exerciseandaging/cover.html>

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Session 4: Assessing physical activity levels

Aim of session:

To achieve a basic understanding of physical activity measurement, and the interpretation of physical activity data

Outline:

1. Why measure activity levels?

2. Implications of population data for individual health

Recommended time: *1 hour (+ 1 hour for tasks)*

1. Why measure physical activity levels?

There are a number of different reasons for assessing activity levels. Physical activity can be measured to:

- establish a person's physical activity level, guide changes in their activity level, and monitor their progress in increasing this level;
- establish the activity level of a group of people (a community group or a nation's population) and determine if their level of activity is sufficient to protect them against conditions caused by inactive lifestyles;
- help design a national physical activity strategy and programmes; and
- increase the activity levels of individuals to health-beneficial levels in a group programme.

Why physical activity is being measured should ideally determine *how* it is measured.

2. Implications of population data for individual health

Population data are collected on individuals. However, these data do not necessarily tell us about each individual's normal behaviour because that individual's behaviour is often measured on one day only. Thus it may not represent that individual's normal activity (as we all do different amounts of activity on different days). However, collecting data from many individuals should provide a clearer picture of normal physical activity patterns in that group.

Population data can allow us to identify, and then target, at-risk groups – those with low activity levels who are therefore more at risk of developing NCDs. The data can be used to assess where interventions to increase activity levels might be effective and to design and monitor programmes to increase activity levels. Often population data will also indicate specific sub-groups with lower activity levels, and so can help to target programmes more effectively.

In summary, group (including population) data are used to:

- set national health policy (including on environment-related issues such as walkways, public transport and recreation areas);
- monitor national public health programmes; and
- assess the physical activity levels of a group and monitor its progress.

Physical activity data are normally derived from questionnaire surveys. It is important to remember that individual or population-level data need to be carefully interpreted, as the method used for interpretation can dramatically affect the findings. For example:

- if you ask about leisure time activities, you will not get information about activity level at work;
- asking how often a person plays sport will not gather information about such activities as walking to work; and
- many people perceive exercise to be only organised aerobics sessions or classes, so asking them how often they *exercise* could lead to underestimates of activity level.

Task 4.1 Interpreting physical activity data from a national survey – *Refer to workshop workbook, Session 4*

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Session 5: Assessing physical activity intensity

Aim of session:

To experience different ways of assessing physical activity intensity

Outline:

1. Introduction
2. Physical activity assessment
    a. Intensity
        i. METs
        ii. Breathing test
        iii. Talk test
        iv. Target heart rate
        v. Rating of perceived exertion (RPE) – the Borg scale
    b. Frequency
    c. Duration

Recommended time: *2 hours (+ 2 hours for tasks)*

1. Introduction

The approach used in this manual is that the activity we do, where and when we do it, whether we record the amount of activity we do, and what we record are up to the individual.

There is no right way to assess activity for an individual or group. Some people just like to get on with it. Some will have a daily physical activity goal in their mind and put a tick in their diary if they have met that daily goal. Some people may have a longer-term goal and prefer to do a formal test of their physical fitness once a month. How or whether you monitor your physical activity progress is your individual choice. Just be active!

Remember, however, that keeping track of your progress to see if you are meeting your goals is generally worth the effort motivationally (see Sessions 8 and 9).

2. Physical activity assessment

Two simple ways to assess an individual's activity level are by questionnaire and by pedometer (see Appendix 2).

Be aware that a pedometer measures only the number of steps a person takes. There are, of course, other beneficial types of physical activity, such as cycling, canoeing, lifting and carrying, that will not be accurately assessed by a pedometer. Reliable pedometers are relatively expensive and thus few people buy them. They tend to be used only by those who are motivated to wear and use them correctly (see Appendix 2).

Questionnaires are commonly used – particularly where many people need to be assessed, such as in a national survey (as discussed above). Simple questionnaires are also used to estimate the activity level of individuals as a basis for giving activity advice (see Appendix 4 for an example).

To determine more precisely someone's level of activity and if it is sufficient for their needs, we need to assess the intensity, frequency and duration of their activity. Physical activity questionnaires normally include questions to determine these. The most important one for health is probably intensity, which is the main focus of this session.

a. Intensity

The energy demand of an activity determines its intensity. There are means of assessing this relatively precisely, such as direct or indirect calorimetry.[2] In this manual we are concerned only with an individual's response to an activity. We are all familiar with our own response to activities of different intensities. If a dog starts chasing us, we will run away as fast as we can – we will breathe hard and puff a lot! This is categorised as vigorous activity.

For most of us, walking briskly would be categorised as vigorous. However, walking at a pace that allows us to carry on a conversation with our walking partner would be categorised as a moderate activity – this is because our body's physiological response is increased, but not enough to make us breathe hard and puff a lot. Strolling across to the neighbours' for a chat would be categorised as a light activity.

[2] Direct calorimetry is a measure of metabolic rate. It is conducted in a closed chamber to determine the heat produced by the activity (usually on a cycle ergometer). Indirect calorimetry measures oxygen consumption by collecting and analysing expired air during an activity. The body generates heat in direct proportion to oxygen consumption (for each litre of oxygen consumed during exercise, the body generates 4.8 kilocalories of heat)

We can think of sitting quietly reading or chatting as an 'energy expenditure base line' against which we can measure the intensity of other activities.

We can assess the intensity of an activity in several ways.

We can estimate the intensity of an activity by referring to tables that show how much energy the activity usually requires. This system rates sitting quietly as using one unit of energy. This unit is referred to as a metabolic equivalent or MET.

If we want to know how hard we are working at an activity while we are doing it (the physical intensity of the activity), there are several different methods, all based entirely or partly on how fast our heart is beating during the activity. These methods include the talk test, target heart rate, and rating how hard we feel we are working (Borg scale).

i. METs

We can use standard scales and tables that indicate the energy demands of certain activities. The most common method is based on the MET or metabolic equivalent.

One MET is the energy demand of an individual at rest (lying or sitting quietly), and is calculated based on the amount of oxygen required for an activity compared to that required at rest.

MET values of light, moderate and vigorous activities

LIGHT (< 3 METs)	***MET value***	***MODERATE (3–4.9 METs)***	***MET value***	***VIGOROUS (5+ METs)***	***MET value***
Lying or sitting quietly	1.0	Gardening	3.0	Chopping wood	5.0
Desk work	1.5	Walking (4.5 km/hr)	3.3	Climbing hills (no load)	6.9
Driving a car	1.6	Cycling (leisurely)	3.5	Walking (8 km/hr)	8.0
Standing	2.0	Golf (walking)	4.4	Jogging (16 km/hr)	10.2
Walking (3 km/hr)	2.5	Swimming (slow)	4.5	Rope skipping	12.0
Housework	2.5	Walking (6.5 km/hr)	4.5		

MET values of selected occupations

Occupation	***MET value***
Receptionist	1.0–2.0
Professional (active)	1.5–3.4
Homemaker	1.5–4.0
Farm worker	3.5–7.5
Construction worker	4.0–8.5
Postman (mail delivery)	2.5–5.0

See workbook (Document 1) for more MET values.

You can use these MET values to approximate someone's energy expenditure. An example is given below, following methodology suggested by the Harvard School of Medicine.

If we know the estimated MET value of a particular activity, we can use a standard formula to calculate the energy expenditure of that activity in kilocalories (kcal) per minute.

kcals per minute = 0.0175 x METs x body weight (kg)

Let's work through an example.

The initial programme you suggest to a 75 kg woman involves walking at about 5 km/hr for 30 minutes 5 days a week.

Intensity: 3.5 METs
Duration: 30 minutes
Frequency: 5 sessions per week
Total duration: 2.5 hours (30 minutes x 5 sessions)
Body weight: 75 kg

Energy expenditure ***per hour***

= 0.0175 [METs (per minute) x body weight (kg) x 60 (minutes)]
= 0.0175 x 3.5 x 75 x 60
= 276 kcal

Energy expenditure ***per week*** = kcal/hour x total duration (hours)

= 276 kcal x 2.5 hours
= 690 kcal

With appropriate nutritional knowledge, this information can be used to construct a physical activity and dietary programme for weight control, including weight loss.

Task 5.1 Metabolic units – *Refer to workshop workbook, Session 5*

ii. Breathing test

Another easy way of judging if an activity is vigorous is the breathing test. The breathing test measures how hard you are breathing. An activity is vigorous if it makes you 'breathe hard and puff a lot'. This test is used widely in physical activity questionnaires to determine if a person does any vigorous-intensity activities.

iii. Talk test

The talk test is also a very simple way of estimating the intensity of an activity. It considers the spare breath you have while doing something. Depending on how much 'spare breath' you have, your activity will be:

Light intensity: I can sing while I'm doing it! Like washing the dishes.

Moderate intensity I can carry out a conversation while I'm doing it (like walking the dog).

Vigorous intensity I can't talk or talking is very difficult while I'm doing it (like digging a wet taro patch).

Task 5.2 Breathing and talk tests – *Refer to workshop workbook, Session 5*

iv. Target heart rate

The more intense your activity, the more oxygen your muscles need and the harder your heart has to pump to supply oxygen-rich blood to those muscles.

You can monitor or assess the intensity of the activity you are doing by using heart rate (see Appendix 3 for instructions on measuring heart rate). To do this, you need to work out two things:

- estimated maximum heart rate (MHR); and
- target heart rates (THRs).

Your MHR is based on your age in years, and your THRs are based on your MHR.

MHR (beats per minute or bpm):

MHR = (220 – age in years)

Say you are 50 years old. Your estimated MHR is:

MHR = 220 – 50 bpm
= 170 bpm

Based on MHR, THRs are calculated for moderate-intensity and vigorous-intensity activity.

i) THR for **moderate-intensity** activity is 50–70 per cent of your estimated MHR:

$THR_{50–70\%}$ = 0.5 x 170 to 0.7 x 170

= 85–119 bpm

For moderate-intensity activity a 50-year-old's THR will be between 85 and 119 beats per minute.

ii) THR for **vigorous-intensity** activity is 70–85 per cent of your MHR:

$THR_{70–85\%}$ = 119–145 bpm

If you are 50 years old, activities that raise your heart rate to between 119 and 145 beats per minute are considered to be vigorous.

Task:

Calculate your estimated MHR and THR for moderate-intensity and vigorous-intensity activity.

a) MHR = 220 – age (years)

= 220 – _____

= _____ bpm

b) $THR_{(Moderate)}$ = 0.5 x MHR to 0.7 x MHR

= ____ to ____ bpm

c) $THR_{(Vigorous}$ = 0.7 MHR to 0.85 MHR

= ____ to ____ bpm

v. Rating of perceived exertion (RPE) – the Borg scale

Another way to estimate the intensity of our physical activity is to estimate how hard we are working.

When we are being physically active, our bodies are working harder than when we are at rest. We can feel the effects, such as our heart beating faster.

The Borg scale is a way of gauging our exertion level based on how we feel while we are doing the activity.[3]

Borg's scale goes from 6 – no exertion at all (such as sitting quietly reading) to 20 – maximal exertion (working as hard as you possibly can). The following is a guide to determine whether your activity is of light, moderate or vigorous intensity.

Rating	*Intensity*
7–11	Light
12–14	Moderate
15–19	Vigorous

Detailed instructions on using the Borg scale are provided in the workbook.

Task 5.3 Target heart rate and rate of perceived exertion – *Refer to workshop workbook, Session 5*

b. Frequency

Frequency is simply the number of times you do an activity each week. For example, you may make the effort to walk to work three times a week:

Frequency of walking = 3

c. Duration

Duration is simply the amount of time you spend doing an activity each time you do it. For example, if you take 25 minutes to walk to work, the duration of your activity is 25 minutes.

If you plan to increase your activity levels by walking with a friend a few times a week for about half an hour, chatting while you walk, then the intensity of your walking is moderate (because you can talk while you walk – from the talk test).

This activity would be described as:

- intensity – *moderate*
- frequency – *3 times a week*
- duration – *30 minutes*

Note:

While assessing activity levels is covered in some detail in Session 6, at the simplest level you can record the amount of time you spend being voluntarily active as a measure of your activity level. For example, 'I went for a 20-minute brisk walk'. Record this in your diary simply as 20 min.

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Session 6:
Assessing physical fitness components and body composition

Aim of session:

To become familiar with the assessment of physical fitness components and body composition

Outline:

1. Fitness components
    a. Aerobic fitness
    b. Strength
    c. Flexibility
2. Body composition

Recommended time: *1 hour (+ 2 hours for tasks)*

1. Fitness components

When we are physically active:

- our muscles are working;
- this uses up energy, which requires oxygen, so we breathe harder;
- to transport the oxygen to our muscles, our heart beats faster; and
- burning extra energy also releases heat, so our body tries to keep itself cool by sweating.

We all feel these effects. It is possible to use them to give an indication of how hard we are working in a task.

We have already considered relatively informal ways of assessing the intensity of our own activity (e.g. the talk test). Now we consider more formal methods of measuring the components of physical fitness.

Assessing someone's fitness level can be done using specific tests, for example:

- step test (to test aerobic fitness);
- modified push-ups (to test muscular strength and endurance); and
- sit and reach test (to test flexibility).

Details of these tests are given in the workbook.

These tests are useful for monitoring changes in fitness over time as someone maintains their participation in a physical activity programme, and can provide useful feedback to help maintain enthusiasm and commitment.

Note that in most cases these tests are used to assess the effectiveness of an activity programme for an individual by seeing if that individual's aerobic fitness, strength and flexibility improve over time. More formal approaches to measurement compare individuals with national norms (standards) using, for example, a standard for age and sex.

Such norms are not available for our populations, so we will use these tests to monitor changes in an individual's fitness over time. But remember: it is very important to do the tests in exactly the same way each time.

It is advisable to do these tests only after a suitable warm-up.

Here are some ways of assessing fitness.

a. Aerobic fitness

Step test

This test involves stepping up and down for a set period at a set rate and then measuring changes in heart rate as you recover.

As aerobic fitness improves you will see:

- a reduction in resting heart rate;
- a reduction in the post-stepping heart rate; and
- an increase in the rate of recovery towards a resting heart rate afterwards.

b. Strength

As we have seen, we need enough strength to manage day-to-day activities with a little to spare to meet the unexpected. Further, strength becomes more important as we get older. As we age, we need enough strength to do everyday things like get up out of a chair, climb steps, open a screw-top jar and lift our grandchildren for a hug. The following two tests assess abdominal and shoulder strength.

Curl-up

The curl-up test measures abdominal strength. Abdominal strength is important for several reasons, but perhaps the main one is that strong abdominal muscles maintain intra-abdominal pressure. Intra-abdominal pressure is a major factor in managing the stability of the lower back. This, in turn, is important in the prevention and control of lower back pain.

Note that many, if not most, adults will have difficulty completing even one curl-up. But this does not matter!

The description suggests that this test be attempted at several levels. Follow the instructions carefully so that success is achieved. That is, start at level 1 and work through to the highest level you can achieve without too much effort.

As your abdominal muscles become stronger, you will progress to a higher level and you will see a reduced waist circumference (and a flatter 'tummy').

Remember, in all these tests, you are comparing yourself with yourself. You are not comparing yourself to others in your group, or to some national or international norm (standard).

Modified push-up

Push-ups measure shoulder strength. While men can generally manage at least one push-up, women may have difficulty. For this reason we suggest the use of the modified push-up.

If you feel you can manage a full push-up, then do it. But be sure you always do it in exactly the same way.

c. Flexibility

As we saw in Session 3, flexibility allows us to twist, turn and stretch. As we get older, we lose flexibility, just as we lose strength. We can monitor our lower back and shoulder flexibility using very simple tests.

Remember to warm up before you attempt these tests.

Sit and reach *(lower back)*

This version of the sit and reach test does not require any equipment. Again, remember to perform it in exactly the same way each time. Read the instructions carefully – do not bounce, but reach slowly and continuously as far as you can.

Fingertip test *(shoulder)*

This a simple test that requires only a piece of cord (or, better still, a tape measure). Simply grasp the cord, palms down, arms straight and about 1.2 metres apart. Keeping your arms straight, raise your arms above your head and then try to lower your hands below your shoulders behind you.

Task 6.1 Assessing phisical fitness – *Refer to workshop workbook, Session 6*

2. Body composition

To assess body composition, there are several measures required:

- height
- weight
- waist and hip circumferences
-

From these simple measures you can assess important health-related body composition factors:

- body mass index (BMI)
- waist/hip ratio (WHR)
- waist circumference

There are other measures, such as skin folds, that assess more precisely the distribution of body fat. However, these require special equipment and expertise.

Details for the administration of these tests are provided in the workbook.[4]

Note:

When we talk about body size and weight distribution, we often think about smokers. One reason smokers give for not quitting is that they think they will put on weight if they stop. And in general, they are right – about 80 per cent of smokers who quit put on weight. They gain weight because quitters tend to overeat or because of the effects of nicotine withdrawal. Physical activity can reduce the desire to overeat. Further, evidence suggests that a quitter would have to weigh at least 40 kg over their recommended weight to match the risk of smoking for coronary heart disease.

Physical activity benefits the many people who are successful in their efforts to quit smoking. Indeed, being physically active can probably help smokers quit.

Task 6.2 Estimating body composition – *Refer to workshop workbook, Session 6*

[4] Full details of these procedures and their interpretation can be found in: Wilson, NC, Russell, DG & Wilson, BD. (2001). Profiling New Zealanders. LINZ Activity & Health Research Unit, University of Otago.

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Session 7: Safety considerations

Aim of session:

To understand the implications of safety issues in designing and implementing physical activity programmes

Outline:

1. Introduction
2. Reasons to take care
   a. Medical issues
   b. Specific medical issues
      i. Antibiotics
      ii. Colds
      iii. Pregnancy
      iv. Diabetics
3. Safety in physical activity programmes
   a. Warm-up
   b. Fluid intake
   c. Work to your own level
   d. Find a safe environment
   e. Cool-down

Recommended time: *1 hour*

1. Introduction

While there are many good reasons for people to be more physically active, there are some circumstances in which caution needs to be used. While these are not big problems, we should be aware of them – to protect both ourselves and the people we are advising.

Physical activity safety includes both medical and programme-related factors. It is necessary to understand these issues in order to be competent to design and implement safe and appropriate physical activity programmes for sedentary (inactive) people.

2. Reasons to take care

Before starting a physical activity programme or becoming more physically active, individuals should take reasonable precautions to protect themselves from any problems. Important factors to consider include existing medical conditions, and ensuring that the activity programme is safe and appropriate.

a. Medical issues

Before a person starts a programme, you should try to determine if there are any medical reasons why they should be cautious. In general, those who should seek medical advice before embarking on an activity programme are:

- males over 45 years of age, and females over 55 years (or who are post-menopausal);[5] and
- anyone with cardiovascular disease (heart problems), pulmonary disease (lung problems) or a metabolic disease (including diabetes).

Care also needs to be taken with smokers and with people who have any of these conditions:

- hypertension/high blood pressure (including those using antihypertensive medication);[6]
- high blood lipid levels (cholesterol, triglycerides);[7]
- impaired fasting glucose tolerance (IGT);
- obesity;[8] and
- family history of myocardial infarction (heart attack, etc.).

In the Pacific Islands, most of the adult population probably fits somewhere in this list!

[5] This applies also to prematurely menopausal women under 55 years who are not on oestrogen replacement therapy.
[6] The WHO guidelines (2003) specify 140 mm Hg as the systolic threshold for even 'low-risk patients'. For high-risk patients it is suggested that the threshold could be lower.
[7] Threshold: LDL >5.2mmol/l/l.
[8] Note that obesity for Pacific peoples is defined by a BMI of 32 kg/m2 or more.

Although these people require some review by a medical professional, the majority would benefit from more physical activity and will probably be advised to increase their physical activity. They will, however, be warned to look out for danger signs such as dizziness and shortness of breath, and advised to increase their activity level very gradually. This is good practice anyway – you never know if someone has an undiagnosed health problem.

It is also good practice (unless people are being referred to you by their doctor) to undertake a quick assessment of people's health and their ability to be more physically active. There are questionnaires that can be useful here. For example, the Physical Activity Readiness Questionnaire (PAR-Q) is a widely accepted one. It asks a series of simple questions about the effects of the individual's current physical activity and about their medical history. If the PAR-Q identifies any potential problem, you should refer the person to a physician for medical advice before starting their programme (see Appendix 4).

b. Specific medical issues

*i. **Antibiotics***

If you are taking antibiotics, avoid vigorous-intensity activity. It is wise to ask the doctor who prescribed your medication whether you should limit your activity programme.

*ii. **Colds***

- Moderate-intensity activities should not be a problem, but take care if you are experiencing breathing difficulties.
- Vigorous-intensity activities can be resumed 3–4 days after the usual cold symptoms have eased.
- If symptoms include a *fever, extreme tiredness, swollen lymph glands* and *aching muscles,* allow 2–4 weeks *after* the symptoms have gone before recommencing *vigorous-intensity* activity. Other activities are fine.

*iii. **Pregnancy***

There is no reason not to be active during a normal pregnancy. Indeed, research suggests that pregnant women who remain active have more energy and fewer pregnancy problems. This means that a woman who is active during pregnancy is likely to require less medical intervention than her sedentary counterparts. Activity helps to strengthen muscles, making pregnancy and labour more comfortable. However, there are some sensible precautions that should be taken to protect both mother and baby:

- Avoid any significant increase in body temperature during pregnancy (i.e. avoid heat stress).
- Wear loose comfortable clothing.
- During the second and third trimesters, there is significant weight gain. This can affect balance and coordination, so avoid rough ground. Activities like aqua-aerobics are good.
- Be careful with prone and supine (lying on side or front) activities that could injure the abdomen.

iv. Diabetics

The complications of diabetes include reduced nerve feelings and poorer blood circulation. This means that diabetics are at more risk of injuring themselves without realising it, and of developing problems from injury. Everyone, but diabetics in particular, should practice good foot hygiene and make sure that their footwear is appropriate and comfortable. Carefully and regularly check your feet and treat any broken skin. Diabetics should seek medical attention if there is any sign of infection.

3. Safety in physical activity programmes

Apart from the concerns about making a client's pre-existing health conditions worse, a major concern is to make sure that people don't injure themselves during an activity, e.g. pull a muscle or get dehydrated. If someone is stiff or in pain the day after doing an activity, they were doing something wrong!

There are a few sensible precautions that can be taken before starting an activity session.

a. Warm-up

- For most *light-* and *moderate-intensity* activities, the first few minutes of the activities themselves are the warm-up.
- For *vigorous-intensity* activities, a warm-up is advisable – generally a light/moderate activity that uses the same parts of the body, e.g. walking before jogging.

- Apart from very gentle stretching during warm-up, to prevent injury do not stretch until the muscles that you are stretching are warm – particularly if you are stretching to increase joint flexibility.
- Avoid over-stretching, especially bouncing.

b. Fluid intake

- Dehydration is a very real issue in the tropics, so it is important to drink enough fluid prior to starting any activity. It is also important to stay hydrated while you are active by drinking regularly during the activity. Thirst is not a good sign of dehydration as it develops late – try to drink water frequently even if you are not thirsty.
- Unless you are undertaking vigorous exercise for long periods (such as training for a marathon) you do not need to use commercial sports drinks. Water is quite adequate.

c. Work to your own level

- Forget *no pain, no gain*. It is wrong and foolish! Work within your own limits and gradually increase your level of activity.
- Don't be afraid to slow down or stop if you are feeling stressed, especially during vigorous-intensity activities. A short break and a drink of water are often all the rest you need.
- If you suffer an injury, e.g. a torn muscle, or if you have breathing problems, don't 'push through the pain'. Stop and rest until you can continue comfortably, or get help.

d. Find a safe environment

- The location should be appropriate to the activity. For example, those starting out should select a reasonably level surface for walking; for floor-based activities select a comfortable surface.
- If possible, avoid busy roads so you don't breathe in too much vehicle exhaust.
- Walk on the road facing the traffic, but beware of blind corners where vehicles may hug the inside curve.
- In urban areas in particular, women may feel uncomfortable walking or running alone. Go with a friend. You are also more likely to maintain your programme if you have company.
- Find a place where dogs are not a problem (or carry a big stick).

e. Cool-down

Cooling down, particularly after vigorous-intensity activities, is important for your body as well as your mind. It brings your heart rate back towards normal, repays any oxygen debt and, as the name implies, allows your body's core temperature to fall – which helps you overcome the exercise-induced sweating that is so uncomfortable in the tropics. As with the warm-up, use the moderate- and then light-intensity equivalent of your exercise activity as a cool-down option.

You should also use the cool-down period to stretch the warmed muscles. This is a good time to work on hip, shoulder and spine flexibility. But do it gently and don't over-stretch. Do not stretch your lower back by trying to touch your toes – this can be DANGEROUS!

Remember:
Physical activity is an important part of a healthy lifestyle, and nearly everyone can benefit from an increase in their current activity level. To keep people safe, we must consider their capability for safe activity and advise them accordingly. Don't push people too hard, for example by trying to make them carry on for another few minutes when they stop for a rest. Instead, encourage them to rest if they feel uncomfortable. If someone does take a break, give them positive feedback (e.g. 'Great – rest until you are ready to carry on. Go at your own pace'). If you go to an aerobics class and the teacher is pushing everyone to carry on, even when they are too tired, maybe it's a good idea to find another class!

Remember, sedentary (inactive) people who want to start an exercise programme should seek medical advice before starting.

3. What are some of the determinants of physical activity?

Some of the factors that research has shown to have a definite effect on participation in physical activity are shown in the table below.

Determinant category	*Effect on participation*
Mental factors	
(psychological, cognitive, emotional)	
Perceived barriers	–
Enjoyment	+
Expect benefits	+
Intention to participate	+
Perceived health	+
Self-efficacy	+
Self-motivation	+
Behavioural factors	
Adult activity history	+
Past exercise programme	+
Social and cultural factors	
Physician's influence	+
Support from friends	+
Support from partner/family	+
Environmental factors	
Climate/season	–
Physical activity characteristics	
Perceived effort	–

Not surprisingly, people who have a history of being physically active in their adult lives tend to continue being active. So do people who participate in a physical activity or exercise programme; this could partly be because of the support that others in a group can offer.

Note that the support of friends and family in someone's efforts to be active are important in determining whether that person is likely to be more active. The influence of advice from the doctor is also important.

Weather has a big influence. It can be too cold to go outside when it is snowing – but in our region it is heat that can be a barrier, so it may help to avoid doing activities in the hotter times of the day.

Participants in one of these workshops discussed what they felt would be the barriers to people in their countries, as well as how they felt these barriers could be overcome. The barriers can be classed as personal (such as motivation), environmental (e.g. weather) and cultural (e.g. church leadership role models). These are shown in Appendix 6. The workshop participants also came up with suggestions for strategies to overcome each of these barriers. This is a good exercise to go through with someone who is trying to be more active but having difficulties doing so.

Task 8.1 Barriers to physical activity – *Refer to workshop workbook, Session 8*

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Session 9: Motivation

Aims of session:

- To appreciate some factors that affect persistence in physical activity behaviours
- To become familiar with some basic motivational techniques

Outline:

1. What is motivation?
2. How can we improve motivation to be more physically active?
    a. Planning
    b. Setting activity goals
    c. Techniques to promote compliance
3. What is commitment?
    a. Factors contributing to commitment
4. Getting inactive people active

Recommended time: 2 hours

1. What is motivation?

Motivation is what encourages or makes a person behave in a certain manner. Our goal is to somehow get people who are physically inactive (or not active enough) to change their behaviour and become more active!

This clearly links into the previous session on barriers – most barriers can be turned around to assist with motivation.

Motivation is what makes us persist in a behaviour, such as church attendance, a physical activity programme or a close relationship. In this topic we consider some of the factors that affect this persistence in a particular behaviour: physical activity.

Rewards (positive reinforcers) are generally better motivators than punishment (negative reinforcers). Rewards for being active can be such things as the social benefits of being active with other people (e.g. family or workmates), or the positive physical and emotional feelings you get when you are active. We should recognise the positive things and try to eliminate or reduce the negative things.

So, when promoting physical activity, maximise the positive reinforcers and eliminate or minimise the negative reinforcers.

2. How can we improve motivation to be more physically active?

a. Planning

What happens before your activity session will often determine whether you actually do it. This is referred to as the antecedents of the activity programme.

- Plan a specific time and place for your activity programme – don't leave it to chance.
- Keep your exercise gear in a handy place – for example, keep your running shoes in your car or at your desk.
- Post written reminders where you will see them – a note on your fridge or stuck to your computer.
- Arrange to meet with others to do your activity.
- Identify a convenient and congenial place to be active – a park, the beach and a friendly gym are examples.

b. Setting activity goals

Generally, beginning modestly is most likely to lead to success. For example, an inactive person who sets a target of an hour's run each day is far less likely to succeed than if they set a target of 30 minutes' accumulated walking each day. Experience shows that the goals that are most likely to be met are, in order of likelihood:

- to be moderately active (most likely)
- to increase leisure time physical activity
- to do unsupervised activity
- to be active in a community setting
- to do resistance training
- to undertake a specific aerobic programme (least likely)

c. Techniques to promote compliance

There are a number of factors and techniques that research has shown can positively influence adherence to a physical activity programme.

- Self-monitoring
    - Diary activity – this can be as simple as a tick for meeting the day's activity goal or as in-depth as an activity diary that records the number of steps from a pedometer or the intensity and duration of the elements of an activity programme.
- Goal setting
    - Set specific measurable achievable realistic and timely (SMART) goals.
    - Use self-monitoring to keep track of progress towards a goal.
        - Self-reinforcement
            - Reward yourself for meeting your goals – especially the small steps.
        - Change self-talk
            - Talk to yourself (inner dialogue) to increase positive thoughts about being active and help reduce negative thoughts ('I can do it', etc.).
        - Relapse prevention
            - Plan to avoid situations that can lead to giving up, e.g. take your gear with you when you travel.
        - Social support
            - Have family and friends join you or at least encourage you.

Task 9.1 Why people are active (or inactive) – *Refer to workshop workbook, Session 9*

3. What is commitment?

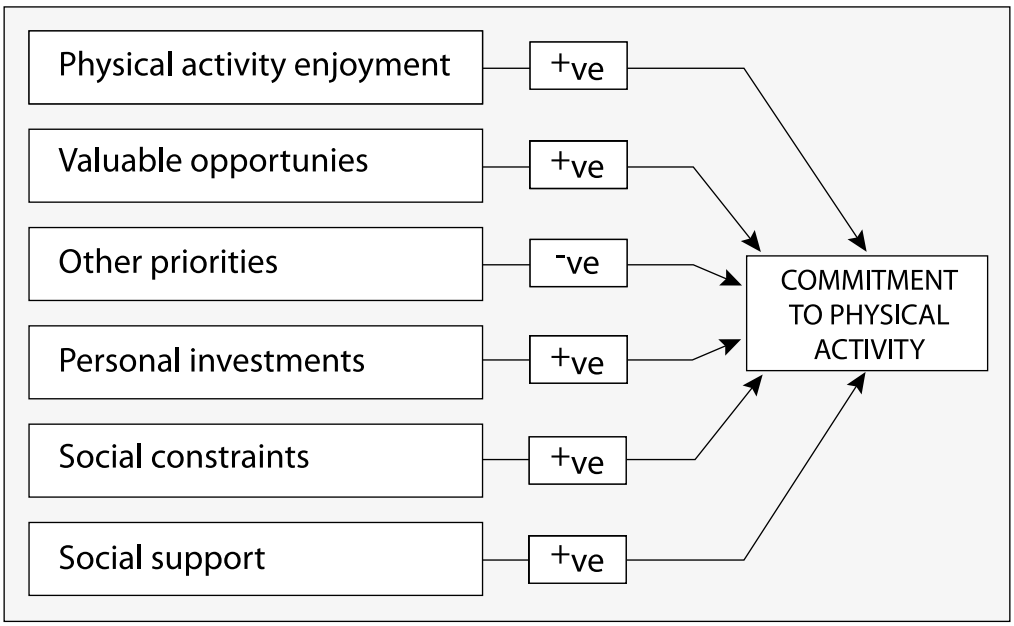
People remain committed to something because being involved is more important to them than quitting.

Commitment is defined as the desire and determination to remain physically active.

a. Factors contributing to commitment

The figure below shows the fachtors influencing commitment. Notice that some things strengthen (+ve) commitment and some lessen or weaken (-ve) it.

Keeping active – the commitment model



Session 8: Barriers to physical activity

Why aren't people more active?

Aim of session:

To understand the characteristics of physically inactive people and to identify and understand the likely reasons why people are inactive

Outline:

3. Introduction
4. Who are the active ones?
5. What are some of the determinants of physical activity?

Recommended time: 45 minutes

1. Introduction

There are many reasons and (excuses!) why people are inactive or not active enough for their health. If you want to help people become more physically active, it is important to understand these reasons. It will assist in developing interventions and advice that help people become and stay physically active.

There are also many reasons why people consider that being physically active is important. Some of the reasons why people are already active or say they should be more active are to feel good, to have fun, to keep healthy, and to do things with friends or family – but enjoyment is the most important (see Topic 9).

Some of the things that people say would help them to be more physically active are having more time, having someone to do it with, and having more energy and more willpower.

2. Who are the active ones?

Data from Western societies show that men are more active than women, younger people are more active than older ones, those with more education are more active than those with less, and people with high incomes are more active than those with low incomes. Information on Pacific people is not readily available. However, the 1996 New Zealand national health survey showed that 42 per cent of Pacific Islands people living in that country were classed as inactive, compared with 22 per cent relatively active and 36 per cent highly active. This was unlike the Western data, which indicated that males and females were both likely to be at least 'relatively active'.

Each of these factors and their effect on our commitment to our physical activity programme are now described.

Physical activity enjoyment: This refers to the feelings of pleasure, liking or loving being active that you get from your physical activity programme. The more enjoyment you get, the stronger your commitment.

Valuable opportunities: Valuable opportunities are the things you would miss if you became inactive – for example, the company of the people you are active with and the good feelings you get after you have completed your activity session, including those you get from feeling more healthy (or being slimmer!).

Other priorities in your life: These are the other commitments you have that get in the way of staying/being more active. They could be your job or your family commitments or your church. The more pressing these other priorities are, the more your commitment to be physically active can be lessened. Highly committed people work around their other priorities so that they can keep active.

Personal investments: This refers to what you have put into becoming and staying physically active. Think of all the time and effort you put into becoming active and how hard you worked, at least in the beginning, to keep active. And you may have invested money as well, for new shoes or perhaps a gym membership. The fact that you would lose these investments tends to keep you committed.

Social constraints: Social constraints reflect the feeling that you need to keep physically active because other people expect you to. It could be your partner being worried about your weight or the possibility of diabetes that encouraged you to become active. Research suggests that the very highly committed are not affected by other people's expectations – only their own.

Social support: Social support refers to the encouragement and support you get from other people to keep being active. Committed people have been shown to have people who support them in their activity programmes. In many cases, this support strengthens commitment. However, while the very highly committed are grateful for the support and value it highly, they don't necessarily keep in a programme because of it. Nevertheless, for most people it is considered to be a factor in strengthening commitment.

During discussions in the 2004 workshop, participants felt that enjoyment was the most important factor.

Task 9.2 Commitment to be physically active – *Refer to workshop workbook, Session 9*

4. Getting inactive people active

There is no magic route to getting people to become more active. However, having a deeper understanding of barriers, motivators and commitment can help in supporting individuals to change.

A tool that is being increasingly used in health promotion (not just for physical activity) is Prochaska-DiClemente's stages of change model. This is based around an understanding of where someone is in terms of a process of change.

People go through five stages in their journey to becoming and remaining physically active. The first is the blissfully unaware (unaware of any need to get moving) and the 'final' stage is where we are maintaining an active lifestyle.

Not ready for change **– pre-contemplation stage**

Physically inactive people who are unaware of the benefits of becoming more active are in what is called the pre-contemplation stage. Many community-based programmes focus on trying to increase awareness among these unaware people of the importance of being physically active. Once a person starts to think about the possibility that they could become more active, they enter the next stage.

***Thinking about change* – contemplation stage**

They are now aware of the need to be more active, and are thinking about it. People at this stage need to be encouraged to do more than think about it – they should be encouraged to take the first step, to begin to plan to be more active. They should be encouraged to think about the pros and cons, and how they can plan to be more active.

***Preparing for action* – preparation stage**

At this stage, they are aware, ready and making plans for how to become more active. Once the decision is made to proceed, the person now works out how, where and when to be active, and who to be active with.

***Getting started* – action stage**

Now the person begins to increase their activity level – probably following their plan.

***Maintaining a good thing* – maintenance stage**

This is the stage where the person is becoming used to their activity, and hopefully forming a habit. This stage requires effort to persist with the increased level of physical activity: in other words, to maintain the commitment. Monitoring the factors that contribute to commitment will help. Note that the commitment interview can be helpful here.

It is important to remember that many people will enter a 'relapse' phase where they stop following their health-promoting behaviour for a variety of reasons. These people can be helped to restart.

The value of this model is in understanding where an individual is in the cycle and then giving specific support to them based on their stage. It can also be used at the population level to target campaigns to population sub-groups at specific stages.

Appendix 7 is an easy-to-follow version of this model from the US Centers for Disease Control and Prevention (CDC)

Session 10: Principles of physical activity programme design

Aims of session:

- To increase the skills and knowledge of the participants in designing physical activity programmes for individuals and groups
- To be familiar with the concepts of frequency, duration and intensity of physical activity and be able to take these into account in the design of a physical activity programme
- To understand the methods of estimating the energy demands of different levels of physical activity
- To be capable of incorporating all these principles into the design of a physical activity programme

Outline:

1. Key points to remember
2. Planning strategy
3. Developing an individual physical activity programme
4. Developing a group physical activity programme

Recommended time: 1 hour (+ 2 hours for tasks)

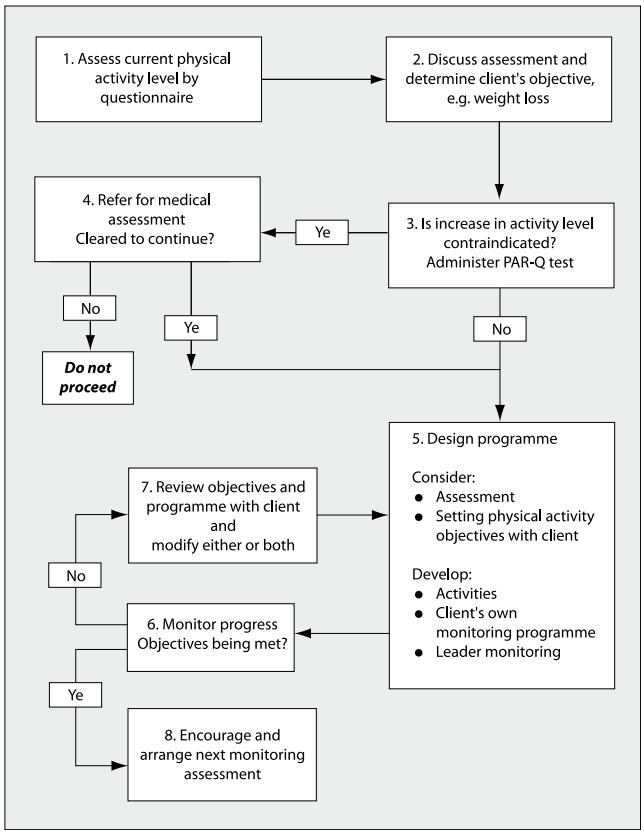
1. Key points to remember

- Programmes can be as formal or as informal as the participant(s) want.
- Advice should be tailored individually.
- A group programme is simply the common elements of individual participants' programmes.
- Most importantly, make the programme enjoyable.

The key things that will vary in a programme are: ***intensity, duration*** and ***frequency*** (refer back to Session 5 for more information).

2. Planning strategy

The flow chart below provides a procedure for advising clients on starting and monitoring an activity programme. It is designed to help with fairly informal assessment and advice, but can accommodate more formal elements. Of course, there are other ways of doing this and you may well have used them, or you may develop a method of your own as you become more familiar with the process.



1. Assess current physical activity level by questionnaire

The purpose is to get a general and reasonably precise idea of your client's current level of physical activity. Do this by using a simple questionnaire, for example the Green Prescription Questionnaire (Appendix 5).

2. Discuss assessment and determine client's objective(s)

Ask your client what they want to get out of increasing their physical activity level – for example, weight control. Discuss the activities your client enjoys and whether, and how, they could contribute to meeting their objective(s). At this stage you are not designing a programme for them, just getting relevant background information to help you if they do proceed.

3. Administer PAR-Q test

For both your and your client's protection, administer the PAR-Q test (Appendix 4). If there is any contraindicating factor, do not proceed – refer them to a physician for advice before proceeding. If there is no contraindication, proceed to step 5 (refer to Session 7: Safety considerations).

4. Refer for medical assessment

If the physician's advice is to continue, proceed to step 5.

5. Design programme

In designing the programme, consider the current physical activity level and the type of activities your client enjoys, e.g. walking, gardening, swimming. Discuss again the client's health-related physical activity objectives and only then prescribe activities that will meet the client's objectives. Make sure the goals are SMART (specific measurable achievable realistic and timely).

Arrange a monitoring process so that the client can monitor their own progress towards their goal. This should be in terms of both fulfilling the programme requirements (e.g. 45 minutes' brisk walking five days a week) and whether the specific health-related objective is being met (e.g. a reduction in waist measurement). Arrange an assessment schedule with your client so that you can review their progress towards their objectives.

6. Monitor progress

Meet with the client and conduct an assessment of their progress towards their goals to determine if the objectives are being met.

7. Review objectives and programme with client and modify either objectives or programme, or both

Motivationally, it is important that the objectives that are set are realistic. This implies that the client has the capacity to do what is required to meet the objectives. If objectives are not being met, go back and either redesign the programme or modify the objectives.

8. Encourage participant and arrange next assessment

If the participant is reaching their objective(s), give them encouragement and arrange for the next session, including the next monitoring session. If objectives have been met, new ones can be set – e.g. further increasing activity level or more weight loss.

3. Developing an individual physical activity programme

Now we consider the practical steps involved in designing an individual physical activity programme. We need to consider all the information we have covered in the previous nine topics.

These steps are:

- Assess the individual's physical activity over the last week.
- Determine if this activity uses the health-related physical activity components discussed in Session 3.
- Discuss the physical activities the individual enjoys and negotiate an activity programme that meets their health-related needs and their own physical activity interests, and can fit into their daily schedule.

Remember, this is a process of negotiation that sets sensible and achievable goals.

1) First, assess your own activity over the last week – see the Personal Physical Activity table in your workbook. This table asks for information on:
   - what activities you have done (type);
   - how hard you worked during each activity (intensity);
   - how often you did the activity (frequency); and
   - how long you did the activity for (duration).

2) Assess and discuss each activity on your client's list.
   - Do these activities cover the range of health-related physical components? (Session 2)
   - Is the client surprised at the amount of physical activity they are already doing?

3) Discuss your client's physical activity over the last week to identify the activities they enjoyed.

Now you have the information to negotiate a activity programme that meets your client's health-related fitness components. Your objective here is to help them develop an activity programme that:

- will increase their activity level to meet the minimum required for health; and
- is tailored to their own physical activity interests and can fit into their daily schedule.

When you have completed Task 10.1, each workshop participant will have a personal physical activity programme that they can try to follow for the remainder of the workshop, and after the workshop.

Task 10.1 Designing an individual programme – *Refer to workshop workbook, Session 10*

4. Developing a group physical activity programme

A physical activity group is a just collection of individuals who can be active together. But be aware that each individual may have his or her own activity goals and preferred activities. When you plan a group programme, negotiate a programme that will take account of these individual differences; there can be individual differences even when working towards a common goal.

Basic planning for an individual is:

- assessment of their readiness for activity and their current activity level;
- setting of agreed goals; and
- monitoring the programme and guiding reinforcement.

Basic planning for a group is:

- individual assessment;
- identifying common elements;
- agreeing on common goals;
- developing group objectives (SMART goals);
- developing an activity programme;
- developing a monitoring programme; and
- consideration of individual and group reinforcement for meeting goals.

Task 10.2 Designing a group physical activity programme – *Refer to workshop workbook, Session 10*

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Session 11: Physical activity guidelines

Aims of session:

- To be aware of differing physical activity guidelines over time and internationally
- To become familiar with the 'Pacific Physical Activity Guidelines for Adults'
- To discuss the importance of policy and strategies for the promotion of physical activity

Outline:

1. History
2. What are some current guidelines?
3. The need to develop guidelines
4. Strategy versus guidelines
5. producing guidelines for Pacific Island countries and territories

Recommended time: 90 minutes

1. History

Over the years there has been increasing interest in physical activity guidelines, and also many changes in what they contain, as evidence and data have grown about exactly how much and what type of activity are needed for optimal health. The major change from 1979 to the present time has been from cardiovascular fitness to general health-related fitness. Indeed, the approach may be described as moving from performance-related to health-related fitness

Here are some examples from the US:

1979	US Department of Health, Education and Welfare – moderate to hard exercise for 15–30 minutes three times a week
1988	Nutritionists get involved. US Surgeon-General's Nutrition & Health report – control weight with a healthy diet and at least 20 minutes of exercise at least three times a week
1996	Clinicians get involved. US National Heart, Lung & Blood Institute – moderate/hard activity on all or most days of the week for at least 30 minutes (cardiovascular disease prevention and rehabilitation)
	US Preventive Services Task Force – 30 minutes of moderate activity on most days of the week 'for prevention in clinical practice'
	US Surgeon-General's Physical Activity & Health report published

2. What are some current guidelines?

Australia	• Think of movement as an opportunity, not an inconvenience. • Be active every day in as many ways as possible. • Put together at least 30 minutes of light- to moderate-intensity activity on most days. • Where possible, enjoy some regular vigorous activity.
New Zealand	• Minimum: At least 30 minutes of moderate-intensity activity on most, but preferably all, days of the week. • Additional health benefits can be gained if you: *Include* at least 20 minutes of vigorous-intensity activity on at least three days of the week. • Enhance strength and flexibility: *Include* some resistance training and flexibility exercises.
World Health Organization	• For an average sedentary adult, engaging in at least 30 minutes of physical activity every day, or on most days of the week, will be sufficient to obtain health benefits. • Moreover, these 30 minutes can be accumulated throughout the day in small bouts of exercise or activity. • Increasing the time, intensity or frequency of physical activity will result in greater health benefits. • A recent report on obesity suggests that 60 minutes is needed each day for sedentary people to prevent weight gain.
Pacific Islands[9]	• Be active every day in as many ways as you can. • Do at least 30 minutes of moderate-intensity activity on five or more days each week. • Additional regular vigorous-intensity activity provides health and fitness benefits.

3. The need to develop guidelines

The WHO Global Strategy on Diet, Physical Activity and Health (May 2004) urged all member states to define:

a. national goals and objectives;
b. a realistic timetable for their achievement;
c. national dietary and physical activity guidelines;
d. measurable process and output indicators that will permit accurate monitoring and evaluation of action taken and a rapid response to identified needs; and
e. measures to preserve and promote traditional foods and physical activity.

Guidelines can help to make it clear to all health staff and the general community what their targets should be. It also helps us to define who is and isn't doing enough physical activity.

4. Strategy versus guidelines

There is often confusion regarding the terms 'strategy' and 'guidelines'. In this document we use the terms 'strategy', 'policy' and 'national plan' to refer to a document that details what steps a country will take to increase physical activity levels. This might include increasing gas/petrol costs for cars, subsidising bicycles, educational campaigns or building new sports facilities.

'Guidelines' are recommendations for how much physical activity individuals should do. They are based on research on how much and what type of activity are needed to improve health. The message is then tailored to suit the local culture and issues.

5. Producing guidelines for Pacific Island countries and territories

Obviously there are variations in the guidelines adopted by different countries. These are based on:

- differing interpretations of the research on the levels of activity needed for maximal health benefits;
- assessment of what messages will work best for the local population; and
- an understanding of the population's current activity levels.

For example, some countries may advise people to walk instead of driving to work and to walk up stairs instead of using lifts/elevators. However, for many islands these may not be issues if there are no lifts/elevators or, as on many islands, few roads.

It may also be useful to include suggestions such as walking or swimming, based on activities that are easily done locally.

Use the Pacific Physical Activity Guidelines for Adults as a start for amount, type and frequency of activity; local authorities can then develop suitable, appropriate and understandable guidelines for their own population.

Task 11.1 Guidelines and strategy for your country – *Refer to workshop workbook, Session 11*

[9] World Health Organization. (2008). Pacific physical activity guidelines for adults: Framework for accelerating the communication of physical activity guidelines. This publication is available from SPC's Health Pacific Lifestyle Section, SPC, New Caledonia.

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Session 12: Healthy eating and physical activity

Aim of session:

To familiarise participants with healthy eating guidelines, and how a healthy diet combined with physical activity can aid weight control

Outline:

1 What food groups do you need to eat?
2 How much food do you need to eat each day?
3 Dietary advice for weight loss

Recommended time: 90 minutes

1. What food groups do you need to eat?

Healthy eating guidelines for Pacific adults:

- Eat a variety of foods from the three food groups. Local foods are best and choose healthier options from each food group.
- Eat plenty of fruit – it's great as a snack.
- Include a generous serving of vegetables in two meals a day.
- Eat fewer foods that are high in fat, sugar or salt.
- Drink plenty of clean water.

Food groups	Examples	Nutrients provided	Advice
Energy foods	Starchy vegetables taro, cassava, cooked green bananas, yam Rice, bread, pasta, noodles	Carbohydrates Dietary fibre Vitamins	These foods should make up 50 per cent of total daily food intake. Local foods are the best choices. Processed foods are high in salt, sugar and fat so eat them less often. Cook food with less fat, salt and sugar.
Protective foods	Fruits and vegetables (including fresh, frozen, dried) and fresh coconut juice are best choices Fruits tinned in juice, tinned vegetables with less salt	Dietary fibre Vitamins and minerals	These foods should make up 35 per cent of total daily food intake. Locally grown produce is the best choice. Tinned foods are often high in salt and sugar so choose fruits tinned in juice and tinned vegetables with less salt.
Body building foods	Fresh fish and seafood, lean meat, eggs, poultry, nuts, seeds and dried beans Tinned fish Processed meat – corned beef, sausages	Protein Fats Minerals	These foods should make up 15 per cent of total daily food intake. Local fresh produce is best. Choose fish tinned in brine with less salt. Processed foods are high in salt and fat so try not to eat these foods every day. Cook food with less fat and salt.

Drinks	Water Coconut juice Fruit juice Fizzy drinks	Water	Drink at least 1.5 L of water each day. Water is best. Sugary drinks contain mostly calories and very few nutrients. The human body is 65 per cent water, so it's important to keep your body hydrated.

The key to using the three food groups is remembering the following points:

- Variety – eat a variety of foods from each group each day.
- Moderation – too much of any one food is unhealthy.
- Local – the best foods are local.
- Amount – eat the right amount of each of the three food groups (see above)

Energy balance

Energy is provided by the food we eat. Food also provides all the essential nutrients for good health. Energy is supplied by the macronutrients (carbohydrates, protein, and fat) in foods.

- 1g fat = 9 kcal
- 1g carbohydrate = 3.5 kcal
- 1g protein = 3.5 kcal

A diet high in fat provides a lot of energy. Fat can add a lot of extra energy to foods, for example:

- slice of bread with no butter – 250 kJ/62 kcal, 0.5 g fat
- slice of bread with a thin spread of butter – 374 kJ/94 kcal, 4.5 g fat
- slice of bread with thick spread of butter – 429 kJ/107 kcal, 9.5 g fat

(Refer to hidden fat posters.)

Energy balance is achieved when the energy provided by the food eaten is enough to meet the energy required by the body to maintain normal body functions and physical activity.

- E (in) > E out => weight gain
- E in = E out => steady weight
- E in < E out => weight loss

You can adjust the amount of energy from the food you eat by:

- reducing the total amount of food eaten each day; and
- eating less high fat, high sugar and high salt food.

Appropriate intake of energy and many kinds of micronutrients (vitamins and minerals) helps maintain good health.

Resources required

Several posters are available from SPC: 'Healthy eating in the Pacific', 'Pacific guide to healthy eating', 'Eat less of these foods for good health' and 'The path to a healthier Pacific'. The fact sheets on healthy eating and healthy lifestyles may also be helpful.

2. How much food do you need to eat each day?

The amount of energy your body needs each day is dependent on your weight, gender, age, level of physical activity and health status. To work out how much you need to eat, you must calculate your daily energy requirements to maintain a healthy weight. These are based on prediction equations, so the figures provide only estimated daily energy requirements for individuals and should be used only as a guide.

a. Calculate your healthy weight (using the BMI equation)

- normal BMI range = 18–25 (BMI of 22 is mid-range, < 25 kg/m^2)
- height $(m)^2$ X 22 = healthy/ideal weight

b. Calculate basal metabolic rate (BMR, kcal/day)

This is the energy your body needs for all normal life functions such as breathing when you are resting or sleeping. BMR varies from person to person depending on age, gender and level of physical activity.

- BMR = standard BMR X healthy weight (calculated above)

Standard BMR by gender and age:

Age group	Men	Women
30–49	22.3	21.7
50–69	21.5	20.7

c. Adjust for physical activity level

Most people who work in an office have very low physical activity levels each day, unless they are engaged in regular physical activity.

- Estimated energy requirements (kcal/day) = BMR (kcal/day) X physical activity level

Standard physical activity factors:

Activity level	Factor
Low	1.5
Medium	1.75
High	2.0

d. Calculate your estimated energy requirements for the day

Estimated daily energy = BMR X physical activity level (kcal/day)

Example:

Calculating the estimated energy requirements for a healthy 45-year-old female currently weighing 85 kg, 1.64 m tall and not engaging in regular daily physical activity.

1. Healthy weight (kg) = (1.64 x 1.64) x 22
   = 59 kg (person is currently obese according to her weight, so she needs to loose weight)
2. BMR (kcal/day) = healthy weight x 21.7
   = 59 x 21.7 (woman, age 45)
   = 1280 kcal/day
3. Adjust for physical activity level
   = BMR x 1.5 (low level as she is not engaging in regular daily physical activity)
   = 1280 x 1.5
   = 1920 kcal/day

To find out whether your energy intake is balanced (i.e. you are eating the right amount of food to meet your body's daily energy requirements, it is good practice to keep a food diary of everything you eat and drink and the amounts for a period of three days. A nutritionist will help you work out the energy content of your diet from your records.

3. Dietary advice for weight loss

You need to look at what you are eating and drinking, and then try to reduce the amount of energy (calories) you are taking in. That doesn't mean just eating less – it means looking at the types of foods you eat as well. Remember that your diet must still be healthy and balanced.

- Eat more fresh fruit and vegetables (which are low in energy and healthy).
- Drink plenty of water.
- Eat fewer fatty and sugary foods (which are high in energy).

a. Weight loss

Aim for 0.5–1 kg (1–2 pounds) of weight loss per week. Losing weight too fast can cause problems. Missing meals and fast weight-loss programmes have been shown to be short-term (i.e. people do not maintain the weight loss).

The best plan to lose weight or to stay a healthy weight is to eat a healthy diet and at the same time do regular physical activity.

b. Portion sizes

The amount of food you eat needs to balance the amount of energy your body needs to maintain good health as discussed above.

You can adjust the amount of energy from the food you eat by adjusting the amount or portions of food you eat from the three food groups each day. Keeping a record will help you keep track of the amounts of foods you eat and drink each day.

It's important to be realistic – if you are used to eating two plates of food per meal, try just one plate.

c. Eating less energy/fewer calories

This does not have to involve just eating less food – it is the type of food eaten that is important.

- Fat contains twice as many calories, or twice as much energy, by weight, as any other food.
- Sugar is often found in foods with little nutritional value except for energy.
- Alcoholic drinks contain a lot of calories/energy.

By eating less fat and sugar, and more fruit and vegetables, you can eat a similar amount (volume/weight) while taking in less energy/fewer calories. This approach is easier to maintain than just eating less food overall. You can eat foods that are high in fats and sugars; the important aspect is size and frequency. You need to eat these foods less often and in smaller amounts – include them as a treat, rather than a daily staple.

Here are some comparisons between different meals/snacks for your information.

Food item	Fat (g)	Energy (kj)
Slice of white toast (27 g)	0.8	329
Slice of white toast with butter/margarine (5 g)	5.0	481
1 boiled egg	5.5	315
1 fried egg (fried with oil)	10.7	535
Taro (boiled) (1 x 100 g portion)	0.6	407
Taro (100 g) with coconut milk (2 spoons)	7.9	725
Fresh tuna – grilled/barbecued (100 g)	11.7	861
Canned fish in oil (drained) (100 g)	13.7	922
Slice of fresh papaya (100 g)	0.1	207
1 doughnut (45 g)	9.9	823

Over a day, if this person:

- chose a boiled egg instead of a fried egg;
- ate their toast without butter;
- ate taro boiled without coconut milk;
- ate fresh tuna instead of canned tuna; and
- said no to the doughnut and had a piece of papaya instead,

THEN … they would eat 28.5 g less fat and 1367 kJ less energy, BUT the same amount of food!

d. Drinks

It's important to drink plenty of fluids when being physically active, as previously mentioned. Being slightly dehydrated can actually make it harder to be physically active as you feel tired more quickly. Water is the best option for staying hydrated.

While fruit juices, coconut juice and milk are full of nutrients, they also contain lots of calories, so be careful of drinking too much of them if you are watching your weight. Sugary drinks like sodas and cola are not good choices for staying hydrated. Special sports drinks are also unnecessary unless you are training for at least 4–5 hours a day at a high intensity. For the rest of us, water will do fine.

Appendices

Note: The following documents required for the tasks are included in the workbook.

Document 1	METS values for selected activities
Document 2	Target heart rate table
Document 3	Rate of perceived exertion scale
Document 4	Individual activity programmes

Appendix 1: Workshop timetable – 28 Nov–2 Dec 2005

Time	Monday	Tuesday	Wednesday	Thursday	Friday
8:30–10:00	Registration (8:30–8:45) Opening (8:45–9:00) 1. Introduction (9:00–10:00) • Physical activity and health • Interpreting population measures • Implications for individual health	5. Country presentations Typical home country physical activities (see also Session 7) Group presentations and discussion 6. Physical activity measurement II (Session 5 continued) Practical	11. Physical activity guidelines (see Session 22) (8:30–9:00) 12. Barriers to physical activity (9:00–9:45) 13. Safety considerations (9:45–10:15) Group discussion and presentations	17. Designing group physical activity programmes 18. Group strategies group task • Design a group physical activity programme Presentation and practical	22. Group task presentations • Group physical activity programme B Practical
10:00–10:30	Refreshment and discussion break	Refreshment and discussion break	Refreshment and discussion break	Refreshment and discussion break	Refreshment and discussion break
10:30–12:00	2. Physical activity • Basic concepts • Performance and health-related fitness • Dimensions of physical activity • Frequency, duration and intensity Presentation & discussion	7. Country presentations Typical home country physical activities (Session 5 cont.) Group presentations and discussion 8. Introduction to motivation (see also Session 20) (11:15–12:00) Presentation	14. Individual physical activity programmes (10:30–12:15) Practical	19. Group strategies group task (Session 18 cont.) Practical	23. Consideration of national guidelines Group discussion and presentation
12:00–1:30	Activity session and lunch	Activity session and lunch (12:00–1:00)	Activity session and lunch	Activity session and lunch	Activity session and lunch
1:30–2:30	3. Healthy eating and weight control Presentation	9. Principles of individual physical activity programmes (see also Sessions 14 and 15) Presentation and discussion	15. Individual physical activity programmes (Session 14 cont.) (1:30–2:15) Practical	20. Motivation (Session 8 cont.) • Individual motivational strategies Presentation and group discussion	24. Revision a Worksho
2:30–2:45	Refreshments	10. Aquatics/aquarobics Practical	Free	Refreshments	Re
2:45–4:00	4. Physical activity measurement (see also Session 5) Practical	Session 10 runs until 4:30	16. Free	21. Group task presentations group physical activity programme A (Session 18 cont.) Practical	25. Post-workshop implementation • Expectations for certificate of completion • Workshop evaluation, etc.
4:00–5:00	Personal activity, e.g. tennis, walking			Personal or group activity	

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Appendix 2: Pedometers

A pedometer is a device with a mechanism that detects movement. There are a wide variety of pedometers on the market, at greatly different prices. The most common design features a small metal arm that moves up and down as you walk or jog. Each time you take a step, the metal arm moves, an electronic or manual counter is triggered and your step is counted and displayed. Some new, more expensive units on the market use a more complex technology to measure distance and speed.

Pedometers can be a great tool to:

- help people realise how little they move – e.g. the average American walks about 3000 steps a day; and
- act as an incentive to add a few more steps each day until the goal of 10,000 is reached.

Choosing a pedometer

It is important when selecting a pedometer to choose one that will be accurate and reliable. Pedometers can be off by as much as 40 per cent, which is quite significant. In studies, the best brands have been found to be about 95 per cent accurate. The worst ones could miss or overestimate by thousands of steps a day.

Unfortunately, the longer you use a pedometer the less accurate it generally becomes. As the mechanism deteriorates, the machine will register fewer and fewer steps! Cheaper models based on a hair-spring mechanism will generally last 6–12 months. Higher-quality devices with either coil-spring or piezo-electric devices have a longer useful life.

What does it count?

Steps: The basic mechanism in all pedometers counts number of steps. Certain things can be extrapolated from this number if the user inputs items like stride length and weight. These calculations are only as accurate as the step count, the input measurements and the formulas used by the pedometer.

Distance: Pedometers calculate distance by multiplying the number of steps by your average stride length. Generally, the faster you walk, the longer your stride becomes, so walking faster than normal will cause underestimations of the total distance walked and slower walking will cause overestimation.

Caloric expenditure: Most pedometers that report caloric consumption require only the weight of the user and, like a treadmill, the read-outs are estimations that use standard formulas with average values for the calories expended by the movement performed and estimates of your metabolic rate. Pedometers by nature cannot know whether an individual is going uphill or downhill or carrying a backpack or other load that affects the person's caloric output. Hence, their accuracy is limited. Generally, the caloric expenditure feature is a poor motivator, and besides, it has a large margin of error depending on the activity performed.

Making sure you use your pedometer correctly

- Wearing it correctly: Pedometers need to be placed on your waistband (e.g. on your belt) and should always be vertical, as close as possible to the midline of your body so that they can accurately record the steps from both feet.

- Be aware that riding in cars and boats, particularly if roads/seas are rough, can add extra 'steps' – a 20-minute car drive may add 2000 steps. So just to be sure, remove the pedometer from your waistband and place it on a level surface; this will stop it registering any bumps as steps.

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Appendix 3: Measuring your heart rate

At any time during activity you can take your pulse to check that you are exercising at a moderate level of intensity. You should take your pulse for 30 seconds and multiply it by 2 to get your heart rate in bpm (beats per minute).

Taking your pulse

To take your pulse while exercising, first stop the exercise you are doing, then stand or sit quietly while you find your pulse and count the number of beats over 30 seconds. To get your beats per minute (bpm), just multiply this number by 2.

For example: Heart rate for 30 seconds = 50

Beats per minute (bpm) = 100

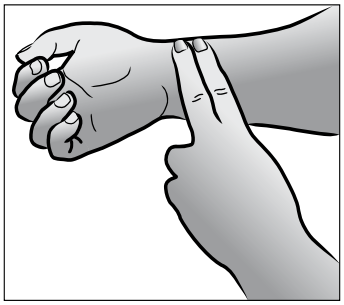
You can take your pulse in several places, but the most common are:

- your *radial artery* (in your wrist); and
- your *carotid artery* (in your neck).

Radial artery

To take your pulse at your wrist:

- Hold one hand palm up and place the index and middle fingers of your other hand on your wrist just below the base of your thumb. Press gently on the artery. There you will feel your pulse. You may have to move your fingers around a little to feel your pulse when you first try.
- Start counting on the minute (e.g. 00 seconds on a digital watch). The first beat after that time counts as 'one'. Count your pulse for 30 seconds and multiply the number of beats by 2 to give you your heart rate in bpm.



Carotid artery

Here is how to take your pulse in your neck:

- Place your forefinger and middle finger on the same side of your neck as your hand, about halfway between the edge of your neck and your larynx (Adam's apple). Press gently. Your fingers should be pointing towards the side, not towards your larynx.
- Once you have found your pulse, follow the counting instructions for your radial artery.

Note: It is not recommended to take your pulse for less than 30 seconds.

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Appendix 4: A test of readiness for physical activity (Modified PAR-Q)

Physical activity is important to health. With some exceptions, becoming more active will reduce your risk of such conditions as coronary heart disease, breast and colon cancer, and osteoporosis, and will help prevent or reduce obesity. But under certain conditions, increasing your activity level can increase the risk of injury. This short questionnaire is your first step towards adopting a more active lifestyle.

Please read each question carefully, and honestly answer by circling Yes or No.

Yes	No	Has a doctor ever told you that you have a heart condition?
Yes	No	When you are active, do you have any chest pain?
Yes	No	Do you have any chest pain when you are resting?
Yes	No	Have you had any chest pain in the last four weeks?
Yes	No	Do you ever pass out or lose your balance because you feel dizzy?
Yes	No	Do you have any joint or other bone problem that you feel would be made worse if you were more physically active?
Yes	No	Are you on medication for your blood pressure or for your heart?
Yes	No	Are you pregnant?
Yes	No	Do you have diabetes?
Yes	No	Are you 60 years or older and do you consider yourself to be physically inactive?
Yes	No	Is there any reason you can think of why you should not be more physically active?

Did you answer 'Yes' to any question? If you did, then please take this questionnaire to the doctor ***before*** you start, and ask the doctor for advice.

If you answered 'No' to all the questions ***honestly***, you can begin to be more active any time, but do it ***gradually***. If anything changes, stop your programme and take the doctor's advice about continuing.

Name: _____	Age: _____ Phone number:_____
_____ Signature	If you have no phone, how can we contact you? _____ _____

This test was given to you by: _____

on *(date)*____/_____/____

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Appendix 5: The green prescription

The Green Prescription was developed by New Zealand's Hillary Commission for Recreation and Sport (now SPARC) to assist general practitioners in assessing and advising patients on physical activity needs and goals.

Initial consultation data

1. Are you currently doing any regular physical activity to improve or maintain your health? (circle one) Yes / No

Enter your answers to question 2 in the table below

2. (a) I want you to think about all the physical activity you have done in the last two weeks around the house, such as gardening and mowing the lawn (not including housework).

   (b) What about activities in your leisure time? What about walking? Sport? And other recreational activities?

   *Vigorous activities are defined as activities that make you breathe hard and puff a lot

Activity	***How often?*** *(Specify per day, week etc.)*	***How long each time?***	***Vigorous?***	***Total hours***
Around the house **Gardening**				
Cleaning				
Recreational activities **Walking**				
Sport (specify)				

3. Does this represent a normal or typical amount of physical activity for you?

   (circle) (a) Yes (b) No, I would normally do more (c) No, I would normally do less

4. Date of birth (___/___/_____) 5. Sex (circle) M / F

   Consultation date (day/month/year) _____/_____/_____

Medical conditions relating to physical inactivity (more than one may apply – please circle)

a)	None	b)	Overweight/obesity
c)	Hypertension on Rx	d)	Total cholesterol >6.5mmol/L
e)	Coronary heart disease	f)	NIDDM
g)	Other (state) ……..		

Physical activity advice given

Walking for …… minutes …….. times a week

Or

…… for ……minutes …… times a week

Appendix 6: Barriers to physical activity in the Pacific

Barrier category	Barrier	Solution
Personal	No time	Use time available
	Shame/embarrassment	Buddy walk for company Sunset/sunrise walks
	Instructor issues	Change instructor Change programme
	Young family	Plan time for activity Family active together
	Health status	Design activity to accommodate Take medical advice
	Motivation issues	Do it with a buddy Do it to music Use a pedometer
	Money	Do inexpensive activities
	Social/domestic issues	Change partner's attitude
	Safety	Buddy/group activities Carry a stick, stones or an umbrella
	Too busy	Flexible time use
	Technology	Low-tech activities Car-free days
	Equipment/gear/clothing	Use what you have
	Unrealistic expectations	Set realistic goals
	Negative attitude	Education (related to 'expectations')
Environmental	Dogs	Protect yourself: buddy, whistle
	Roads	Footpaths/walking trails
	Facilities (shower at work)	Work to have installed Non-equipment activities
	Too hot/too wet	Vary activity/be flexible/use common sense
	Robbers	Buddy/select environment
	Traffic congestion	Change route/time
Cultural	Religious restrictions	Activities consistent with beliefs
	Dress code	Comfortable/affordable/appropriate
	Commitment	See Topic 9 – Motivation
	Beliefs about pregnancy, etc.	Education and awareness
	Competitiveness	Encourage non-competitive activities
	Gender	Separate programmes/appropriate activities/modify traditional activities
	BIG is beautiful	Education
	Lack of leaders as role models	Involve them

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Appendix 7: CDC version of stages of change model

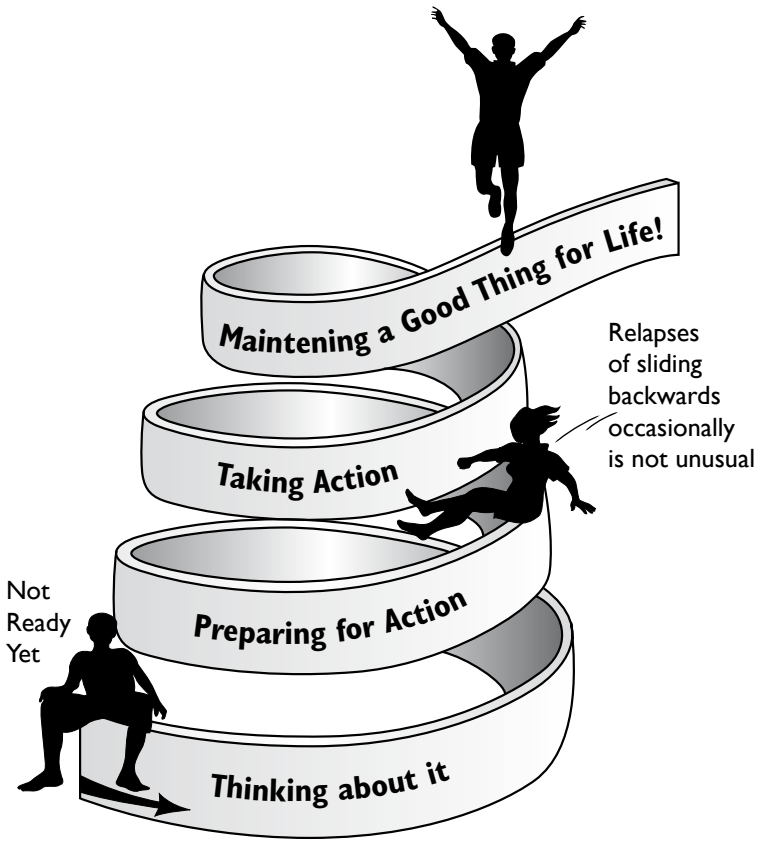
GETTING STARTED

The victory is not always to the swift, but to those who keep moving.

So, you already know that regular physical activity can do great things for your health and well-being. And when you pair that with good nutrition, your body is sure to thank you! But isn't getting started the hardest part? Like any change in your life, knowing where you are and where you're going is important.

Have you ever noticed that what works for some people when they make a change in their life may not work for you? Most people move through a series of five stages of readiness as they change behaviours. What helps someone in one stage may not work for someone in another stage. Look at the graphic below to see where you fall in the stages of change.

Stages of change in adding physical activity into your life – where are you?



These stages represent a spiral path to adopting regular physical activity into your life. Each stage involves a period of time to acquaint yourself with new behaviours.

Effort and commitment are needed in all stages. You will move through each stage as you are ready to change. The interesting part of this model is that it recognises that you may not always move forward in a straight line. There will be times when you lapse, going back to an earlier stage. Then the time will come when you are ready to advance. This is expected and part of the process of adopting new behaviours. You will progress when you are ready.

STAGE 1: NOT READY FOR CHANGE

As the title suggests, you're not ready for change right now. You're not even thinking about adding physical activity into your daily routine. If you were thinking about it, you'd be planning to do something different than what you're doing today – little or nothing. You may have tried physical activity in the past, and not succeeded in adding it into your life. This is a good time to consider the pros, and the cons, of becoming more active.

Pros – wanting to do this

Check off the benefits (pros) that you want to experience. Maybe you want to:

- ☐ Maintain a healthy weight.
- ☐ Feel better in body, mind and spirit.
- ☐ Shed extra pounds and abdominal fat.
- ☐ Live longer by reducing the risk of heart disease and diabetes.
- ☐ Look your best.
- ☐ Feel less tired and have more energy to get things done.
- ☐ Set a good example for your family.
- ☐ Sleep more soundly.
- ☐ Improve bone density, reducing the risk of osteoporosis and fractures as you get older.
- ☐ Reduce feelings of tension, stress, anxiety and/or depression.
- ☐ Become stronger.
- ☐ Discover enjoyable new activities.
- ☐ Feel better about your body.
- ☐ Have fun.

What other reasons do you have for wanting to be more active?

Cons – what's stopping you?

Check off the following barriers (cons) that are holding you back. Maybe you:

- ☐ Don't know how to find time in the day for physical activity.
- ☐ Are busy and stressed, and you don't want to take on another challenge.
- ☐ Want to spend your free time with your family and fear that a physical activity routine will interfere.
- ☐ Find physical activity boring.
- ☐ Think that you need to spend money on special equipment or health clubs to become more active.
- ☐ Have some lingering doubts about becoming more active.
- ☐ Don't like to sweat and you don't want to shower afterward.
- ☐ Don't know how to exercise.
- ☐ Are concerned about how you look while exercising or wearing exercise clothes.
- ☐ Don't want to check with a doctor to begin an activity programme.
- ☐ Have aches and pains that keep you from physical activity.
- ☐ Feel you are too old to start or learn how.
- ☐ Don't know anyone else who can join you.
- ☐ Had a bad experience with sports or exercise in the past.

What other barriers are holding you back?

Now that you've identified your pros and cons, where do you stand? *Which benefits are you most excited about? Which barriers do you feel strongest about?* Often when you see what items are most important, you will begin to shift your views about physical activity and decide that finding easy ways to add physical activity into your life is exactly what you want to do.

Do you see those barriers as something you want to explore, or are you satisfied in remaining inactive? If you have no desire to learn more about physical activity or you get upset when people mention it to you, you're not ready to consider easy ways to have more energy throughout the day. However, if you are open to learning more, you will find that working with the barriers you identified will help release you from your defences.

STAGE 2: THINKING ABOUT CHANGE

So, you are thinking about becoming physically active within the next six months! Imagining yourself involved in physical activity is the first step in adopting a healthier lifestyle. You assessed the benefits of engaging in physical activity, and you determined your barriers to success. Congratulations! You have taken some important steps, and now it is time to continue down the road to becoming more physically active.

Perhaps you're waiting for the magic moment to make some changes. Why not start now? Do you remember a time when you were physically active and felt great? Physical activity does not have to follow the old and incorrect maxim of 'no pain, no gain'. Physical activity can be fun! Can you imagine taking a 15-minute walk on a beautiful day? Playing touch football with your kids in the backyard? You can do it! Remember, physical activity makes more energy than it takes, and taking just one of the following steps is all you need to get started.

Find the time

Figure out when you could possibly fit physical activity into your already busy schedule. You will find opportunities at home, at work and elsewhere (e.g. walking up and down the stairs for 15 minutes during your lunch break). What is important is discovering that you do have time in your schedule. All it takes is that first step. Remember, accumulating 30 minutes of moderate-intensity physical activity (such as brisk walking) 5 or more days of the week is recommended.

Remember your physical activity successes and interests

Think about physical activities that you have enjoyed or that sound interesting. Were there times in your life when you played a sport on a regular basis? Are you interested in taking a physical activity class such as aerobic kickboxing, tennis or fly-fishing? Consider activities that you can do alone (e.g. walking) or with a friend (e.g. tennis), and include indoor and outdoor activities. Some possibilities are: walking, yoga, low-impact aerobics, gardening/yard work, frisbee, volleyball, swimming, basketball, dancing, skating, biking, tennis, hiking, stair climbing, softball and jogging. Keep a list by your phone at work or home and jot down new ideas as they come to mind.

Develop a support network

Not yet convinced that you can become more physically active? That's where the people you know can help you out. Discuss your concerns with peers, family, friends or co-workers who are physically active. Find out how they got started and what keeps them motivated. They might have some great 'tips for success' about how to incorporate moderate-intensity physical activity into your daily routine. Turn to them for ideas, motivation and support. Work together to get started and keep going. Name two people with whom you will talk and from whom you will seek support. Set dates within the month for your discussion with them.

Recall your current level of activity

Nobody knows you better than you do. In this case, knowing your current level of activity will help you decide where there is room for change. Consider the following questions to help you recall your current level of activity.

- How often do you participate in physical activity of at least moderate intensity?
- How active is your job?

- How active are you during lunch or breaks at work?
- What do you tend to do before or after work?
- What kind of activities do you do on a typical weekend or day off work?
- How often do you do active indoor chores such as scrubbing the bathtub, cleaning out the garage, painting, washing windows, working on the house, or carrying out heavy bags of trash or recyclable goods?
- How often do you do active outdoor chores such as mowing the grass, washing and waxing the car, gardening, heavy yard work, caring for large animals or doing home repair?

Be honest with yourself. Choose one of the following areas in which you think you can make realistic changes.

- Work
- Lunch/break time
- Before/after work
- Weekends
- Active indoor chores
- Active outdoor chores

Set small, specific goals

Okay. You've thought about your favourite physical activities, chosen a support network, and identified one target area that you want to address in the next month. This information can help you set some achievable goals. For example, if you chose physical activity at work as the target area you want to address this month, a specific goal might be to use the stairs instead of the elevator at least twice a week. This is always better than a general approach such as, 'I will be more active this month.' By starting small and increasing your goals at a pace that feels right for you, all the benefits of physical activity can be yours. And if you have some setbacks, that's okay. Accept that lapses happen and begin again. You will achieve success.

It is also important to build on your goals. For example, if you are successfully walking once a week as your specific goal, after several weeks add an additional day. Now you'll be walking twice a week. The following month increase the number of days per week and the amount of time you walk. Also, add another activity such as cycling or gardening on the weekends.

Reward yourself

You deserve a medal! Once you've set and achieved some specific goals, celebrate your successes – no matter how small. You might choose a reward that is related to physical activity. How about workout clothing or new athletic shoes? Or reward yourself with a trip to the movies or tickets to your favourite play or sporting event.

Develop long-term vision

Keep in mind that health professionals recommend 30 minutes of moderate-intensity physical activity (e.g. gardening or walking) a day at least five days a week. This can be your long-term goal, but for now just keep building on your successes month by month.

STAGE 3: PREPARING FOR ACTION

Whether you've decided to start being physically active now or you would like to be physically active on a more consistent basis, congratulations! You have taken an important step by focusing on future goals. Now, it's time to take action.

Do you remember a time when you were physically active and felt great? You can feel that way again. Simply make a commitment to incorporate moderate-intensity physical activity into your lifestyle, slowly but surely. For instance, this could mean riding your bike to the local market to pick up a few items for dinner. The following steps will provide you with the tools you need to develop a plan of action to meet your goals. You can do it!

Develop support

Share your commitment to becoming physically active with those around you. When seeking the support of others, help them understand your reasons for change so they can help you. Make use of the support networks that exist around you, such as friends or co-workers who are willing to help you remain motivated. Find friends, co-workers or family who

will join you for evening walks. Gather a group for a weekend hike and picnic. Name two people who you will rely on for support and motivation.

Getting ready for physical activity can also mean changing your surroundings (e.g. home, work and car) to support your goals. Keep comfortable walking shoes at work or in the car. Have an exercise bag packed and ready to go. Post motivating messages in your day planner or on your bathroom mirror.

Name two ways you would like to alter your environment to support your goals.

Find the time

With some creative thinking, you'll find ways to squeeze a little more time out of your busy schedule. Adding short bouts of physical activity throughout the day really works. Walk down the hall instead of using the telephone or email. Park further from the door. Could you get up earlier to take a brisk walk? Climb up and down the stairs for 20 minutes during lunch?

Think about your schedule at work, home and elsewhere. Find at least three slots that you could devote to physical activity during the next week, and write them down.

Make change a priority

Perhaps you've already made small changes in your level of activity that you can build on, or maybe you will be starting fresh. Either way, adding physical activity into your lifestyle is now at the top of your priority list. You can be confident that you are on the road to success. Choose one area of your life (e.g. work, lunch/break time, before/after work, weekends, active indoor chores, active outdoor chores) that you want to address in the next week.

Create a plan of action

You've developed a strong support network, found three time slots for physical activity, and chosen one area of your life that you want to address in the next week. The next step is to set some achievable goals and create a plan of action. For example, if you chose physical activity after work as the area to work on for the week, a specific goal might be walking the dog after work 4 days a week.

Now it's your turn! Choose four physical activity goals that you hope to accomplish within the next month.

Monitor your progress

Keep in mind that occasional setbacks do not mean failure. On the contrary, you have set and achieved some specific goals. However, it is important to plan for events that might disrupt your physical activity routine. For example, if you know it will rain all week, rent a physical activity video to use in your home. Right now, make a list of potential setbacks to your routine and how you will overcome them.

It is also important to monitor your progress. Self-monitoring can help you meet your goals by increasing your awareness of the changes you have or have not made. It is also important to build on your goals. For example, if your first weekly goal is to walk the dog 30 minutes twice a week, build on this goal the following week. So, by the end of week 2, your goal will be to walk the dog 30 minutes twice a week plus gardening on Sundays. Try keeping an activity log for your daily activity.

Reward yourself

You deserve a medal! You set and achieved some specific goals. Reward yourself with a gift. Here are some ideas: a health club membership, tickets to a sporting event, a massage, a new CD.

Use long-term vision

Keep in mind as you are progressing that health professionals recommend at least 30 minutes of moderate-intensity physical activity at least 5 days per week. This can be your long-term goal, but for now, just keep building on your successes week by week.

STAGE 4: TAKING ACTION

At this stage, you've been busy the last few months planning and becoming physically active on a regular basis. You have made important decisions and are working to make changes in your life. Way to go! A large part of your plan is in action and you are making physical activity an important part of your life.

By including regular physical activity in your schedule each week, you've shown a commitment to yourself and your health. Are you enjoying the rewards of added energy and a newfound sense of well-being? You've taken old habits and replaced them with healthy actions. The benefits you identified earlier when considering 'pros and cons' probably outweigh the barriers. You can be proud of your success – you're making progress! The following steps will support you in reaching your activity goals and will keep you on the right track.

Create balance in your life

Any change is difficult and recently you've added regular physical activity into your life. In doing that, you've taken time away from other things in your busy schedule. Your energy level is increasing but you can't be a super being and do everything. Creating balance in your life is important.

Review the activities in your busy schedule. Protecting your commitment to become physically active is important. Here are some helpful tips.

- Be realistic. Gradually adding moderate-intensity physical activity to your life will give you added energy. Don't overdo it. You put yourself at risk for injury if you increase too much, too fast.
- Select a menu approach to adding additional activities. Think about activities that you have wanted to do in the past and include them in future plans. Vary your routine to help keep boredom away. Have fun.
- Replace bad thoughts with good ones. When you hear yourself saying, 'I should be better (or faster) at this by now,' counter by saying, 'I have made some real improvements and am right where I need to be.'

Support yourself in thoughts and action

Surround yourself with people who support your new, active lifestyle. Not all of your family members, friends or co-workers may want you to succeed in becoming more active. You will develop new habits that might not include them and that may be a problem. Remember the stages of change. Your path will be different from theirs. Visualise your response to a non-supportive friend who discourages you from wanting to be something different – more energetic and healthy. Be assertive in your response.

Some people find supportive messages surrounding them very helpful. Leave encouraging notes to yourself or 'to-do lists' at home, in the car or at the office. A message in the car that reminds you to park further away from the grocery store will give you an opportunity to walk a few extra minutes.

Can you find ways to make it easier to add activity into your day? Leaving an extra pair of walking shoes at the office or in your car would be one way. Your dog only has to walk around the block once to believe you will walk him every day at that same time. How can you say no to your favourite pet, even if you grumble the entire time? You'll soon find yourself looking forward to the time … you really will. What are two supportive actions you can take to maintain or enhance your current level of physical activity?

Pat on the back

Give yourself a big pat on the back for becoming physically active. You are making great strides in adding health benefits and strength to your life. Build in rewards to maintain your motivation. These can be setting goals for yourself or something you can get your hands on, such as a new pair of walking shoes. What would motivate you?

Review long-term vision

You may want to contract with yourself to reach certain goals. What are your long-range (one year or longer) goals for physical activity? List three short-term (three to six months) goals that will help you reach your long-range goal. Be specific.

Utilise your support network

Maintain a buddy system. Knowing you can ask a co-worker or family member for support is helpful. Mentors are important in the work setting. They help you make the right decisions and show you the ropes.

Do you know someone who would make a good mentor or buddy in maintaining or increasing your current activity patterns? What type of support and feedback do you need from your friends or mentor to be successful?

Plan for setbacks

Think about times when you will be tempted not to be active (e.g. added demands of work and family, the flu, a rainstorm or out-of-town visitors). List for yourself any events that have gotten in the way so far.

Accept that these lapses will happen. It does not mean that you have failed or will not get back into your regular habit. Be aware that during the first six months of any behaviour change, you are at risk of reverting to old habits. Lapses are a normal part of the change process. If you plan and prepare for events that are likely to happen, you can prepare to hurdle over them as well. You've heard the term 'Get back in the saddle'. If you do lapse, just start right back where you left off. You'll thank yourself afterwards.

STAGE 5: MAINTAINING A GOOD THING

Regular physical activity has become a part of who you are. You have kept the commitment to include activity in your everyday life and are a source of encouragement to others. The benefits of good health are important to you. The steps you've taken have been major and now you are physically active on 5 or more days of the week. Congratulations!

Look back to when you first started to become physically active. Do you remember some of your early struggles? You made the decision to overcome the barriers and succeeded in finding ways to increase your energy level and physical skills. One of the most important steps in maintaining your current success is anticipating minor slips.

Threats to success

It may be difficult for you to imagine a time when you will not want to continue regular physical activity. Repeat this next sentence three times (out loud and with feeling): 'Minor slips will happen'.

The greatest threat for relapse is overconfidence or believing it won't happen to you. It will happen and you have to plan for it. List two situations where you may be tempted to stop your regular activity, if only for a few days (e.g. vacation, a bout of flu, demands of work and family).

It's important to plan how you will handle these interruptions in your daily routine. If you know they will happen, you can plan around them. What can you do to reschedule physical activity during one of the situations you listed?

You have special friends and co-workers who have been encouraging you. Often as your activity level increases and becomes routine, this support stops. Because you're doing so well and exercise now is part of who you are, your friends may not believe you need the extra encouragement. Re-examine what you need from them and ask them to help you again. They can be the first ones to see old behaviours coming back. Ask them for continued feedback.

Tell-tale signs of danger

- 'I've got nothing to worry about.'
- 'I'll never be a couch potato again.'
- 'Nothing will stop me from including physical activity in my day.'
- 'I'm safe. My friends or family won't let me quit.'
- 'I've only missed a few days and will start back soon.'

Have you heard yourself say any of the above sentences? These are signs that you may be in danger of overconfidence. Old habits die hard. Watch for times when temporary lapses lead to disappointment or giving up. That old couch will be calling you and reminding you of its comfort and support for your weary bones. What will you say back? Remember how hard it was in the beginning. Keeping up your commitment to physical activity today is as important as it was when you started.

Keep your balance

Just as you planned how to remove your barriers to physical activity months or years ago, it's time for you to do so again. Review the benefits and barriers from when you assessed the 'pros and cons' earlier. How have your barriers changed from when you started becoming physically active? What are some of the things you can put around your home or office to reinforce your efforts? What are some of the things you can remove that contribute any threat to your activity? List two plans of action you can take to support your continued goals.

Maintain self-confidence

You have a sense of confidence that regular physical activity brings into your life. You have more energy and are also adding health benefits such as reducing the risk of developing or dying from some of the leading causes of illness and death. Maintaining this sense of well-being is important. When you are confident that you will continue to remain physically active, your success rate goes up.

How confident are you of participating in regular physical activity under the following conditions:

- When you are tired?
- When you are in a bad mood?
- When you feel you don't have time?
- When you are on vacation?
- When it is raining?

Mentor others

Look back at how others helped you adopt new behaviours. Their support and encouragement may have made a difference in your efforts. Did someone offer to show you the ropes or share a new technique that worked for you? It's time you became part of the buddy system – but on the other end. You have made progress through the transition of adding regular physical activity into your life. It's been both hard and rewarding, even fun on most days. Share your skills with someone else. *Having others depend on you will increase your likelihood of continued success*. Being a role model will bring good feelings from helping others and will reinforce your motivation to stay with your active lifestyle.

References

Information in the 'Getting started' section was adapted from: Centers for Disease Control and Prevention & Cooper Institute for Aerobics Research; *Personal energy plan – physical activity: Steps for adding PEP to your life*. Dallas: Cooper Institute, 1999.

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Appendix 8: Examples of activities designed to improve aerobic endurance, strength and flexibility

This Appendix provides examples of activities designed to improve aerobic endurance, strength and flexibility. For each activity, suggestions are made about frequency and duration, safety issues and how to increase your level.

a. Endurance

An endurance activity is any activity – walking, jogging, swimming, raking – that increases your heart rate and breathing for an extended period of time.

How much, how often?

- Build up your endurance gradually, starting out with as little as 5 minutes of endurance activities at a time, if you need to.
- Starting out at a lower level of effort and working your way up gradually is especially important if you have been inactive for a long time. It may take months to go from a very long-standing sedentary lifestyle to doing some of the activities suggested in this section.
- Your goal is to work your way up, eventually, to a moderate-to-vigorous level that increases your breathing and heart rate. It should feel somewhat hard to you (level 13 on the Borg scale – see Session 5).

Safety

- Endurance activities should not make you breathe so hard that you can't talk. They should not cause dizziness or chest pain.
- Do a little light activity before and after your endurance exercise session, to warm up and cool down (e.g. easy walking).
- Stretch after your endurance activities, when your muscles are warm.
- As you get older, your body may become less likely to trigger the urge to drink when you need water. In other words, you may need water, but you won't feel thirsty. Be sure to drink fluids when you are doing any activity that makes you lose fluid through sweat. The rule of thumb is that by the time you notice you are thirsty, you are already somewhat dehydrated (low on fluid). This guideline is especially important in our hot climate, where dehydration is more likely.

Progressing

When you are ready to progress, first build up the amount of time you spend doing endurance activities; then build up the difficulty of your activities. For example, first, gradually increase your time to 30 minutes over several days to weeks (or even months, depending on your condition) by walking longer distances, then start walking up steeper hills or walking more briskly.

Examples of activities that are moderate for the average adult are listed below. Some adults, especially those who have been inactive for a long time, will need to work up to these activities gradually.

Moderate:

- swimming
- bicycling
- cycling on a stationary bicycle
- gardening (mowing, raking)
- walking briskly on a level surface
- mopping or scrubbing the floor
- golf, without a cart
- tennis (doubles)
- volleyball
- rowing
- dancing

The following are examples of activities that are vigorous. People who have been inactive for a long time or who have some of the health risks listed in the safety section should not start out with these activities.

Vigorous:

- climbing stairs or hills
- brisk bicycling up hills

- digging holes
- tennis (singles)
- swimming laps
- hiking
- jogging

b. Strength

Even very small changes in muscle size can make a big difference in strength. An increase in muscle that is not even visible to the eye can be all it takes to improve your ability to do things like get up from a chair or climb stairs.

About strength exercises

To do most of the following strength exercises, you need to lift or push weights, and you need to keep gradually increasing the amount of weight you use. You can use the hand and ankle weights sold in sporting-goods stores, or you can use things like emptied water bottles filled with sand or water, or socks filled with rice or dried beans and tied shut at the ends.

There are many alternatives to the exercises shown here. For example, you can buy a resistance band (it looks like a giant rubber band, and stretching it helps build muscle) at a sporting-goods store to do other types of strength exercises. Or you can use the special strength-training equipment at a fitness centre.

How much, how often?

- Do strength exercises for all of your major muscle groups at least twice a week. Don't do strength exercises for the same muscle group on any two days in a row.
- Depending on your condition, you might need to start out using as little as 0.5–1 kilogram (1–2 pounds) of weight, or no weight at all. The tissues that bind the structures of your body together need to adapt to strength exercises.
- Use a minimum of weight the first week, and then gradually build it up. Starting out with weights that are too heavy can cause injuries.
- At the same time, remember that you have to gradually use a challenging amount of weight in order to benefit from strength exercises. If you don't challenge your muscles, you won't benefit from strength exercises.
- Lifting or pushing the weight should feel somewhere between hard and very hard (15–17 on the Borg scale – see Session 5) for you. It should not feel very, very hard. If you can't lift or push a weight 8 times in a row, it's too heavy for you. Reduce the amount of weight. If you can lift a weight more than 15 times in a row, it's too light for you. Increase the amount of weight.
- When doing a strength exercise, do 8–15 repetitions in a row. Wait a minute, and then do another set of 8–15 repetitions in a row of the same exercise. (Tip: While you are waiting, you might want to stretch the muscle you just worked or do a different strength exercise that uses a different set of muscles.)
- Take 3 seconds to lift or push a weight into place, hold the position for 1 second, and take another 3 seconds to lower the weight. Don't let the weight drop; lowering it slowly is very important.
- Stretch after strength exercises, when your muscles are warmed up. If you stretch before strength exercises, be sure to warm up your muscles first (through light walking and arm pumping, for example).

Safety

- Don't hold your breath during strength exercises. Breathe normally. Holding your breath while straining can cause changes in blood pressure. This is especially true for people with cardiovascular disease.
- Avoid jerking or thrusting weights into position. That can cause injuries. *Use smooth, steady movements.*
- *Avoid 'locking' the joints* in your arms and legs in a tightly straightened position. (A tip on how to straighten your knees: tighten your thigh muscles. This will lift your kneecaps and protect them.)
- Breathe out as you lift or push, and breathe in as you relax. For example, if you are doing leg lifts, breathe out as you lift your leg and breathe in as you lower it. This may not feel natural at first, and you will probably have to think about it as you are doing it for a while.
- Muscle soreness lasting up to a few days and slight fatigue are normal after muscle-building exercises, but exhaustion, sore joints and unpleasant muscle pulling are not. The latter symptoms mean you are overdoing it.
- None of the exercises you do should cause pain. The range within which you move your arms and legs should never hurt.

Progressing

Gradually increasing the amount of weight you use is crucial for building strength. When you are able to lift a weight 8–15 times, you can increase the amount of weight you use at your next session.

Here is an example of how to progress gradually:

Start out with a weight that you can lift only 8 times. Keep using that weight until you become strong enough to lift it 12–15 times. Add more weight so that, again, you can lift it only 8 times. Use this weight until you can lift it 12–15 times, and then add more weight. Keep repeating.

Fact: Although they might not notice it as it happens, most people lose 20–40 per cent of their muscle tissue as they get older. Strength exercises can at least partly restore muscle and strength.

Examples of strength exercises

1. Arm raise (strengthens shoulder muscles)

Sit in a chair, with your back straight. Your feet should be flat on the floor, spaced apart so that they are even with your shoulders. Hold hand weights straight down at your sides, with your palms facing inward. Take 3 seconds to lift your arms straight out, sideways, until they are parallel to the ground. Hold the position for 1 second. Take 3 seconds to lower your arms so that they are straight down by your sides again. Pause. Repeat 8–15 times. Rest; do another set of 8–15 repetitions.

Summary:

1. Sit in chair.
2. Feet flat on floor; keep feet even with shoulders.
3. Arms straight down at sides, palms inward.
4. Raise both arms to side, shoulder height.
5. Hold position.
6. Slowly lower arms to sides.

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2. Chair stand (strengthens muscles in abdomen and thighs)

Sit towards the middle or front of a chair and lean back so that you are in a half-reclining position, with back and shoulders straight, knees bent and feet flat on the floor. Be sure to place pillows against the lower back of the chair first, to support your back and keep it straight. Using your hands as little as possible (or not at all, if you can), bring your back forward so that you are sitting upright. Your back should no longer be leaning against the pillows. Keep your back straight as you come up, so that you feel your abdominal muscles do the work; don't lean forward with your shoulders as you rise. Next, with feet flat on the floor, take at least 3 seconds to stand up, using your hands as little as possible. As you bend slightly forward to stand up, keep your back and shoulders straight. Take at least 3 seconds to sit back down. Your goal is to do this exercise without using your hands as you become stronger. Repeat 8–15 times. Rest, then repeat 8–15 times more.

Summary:

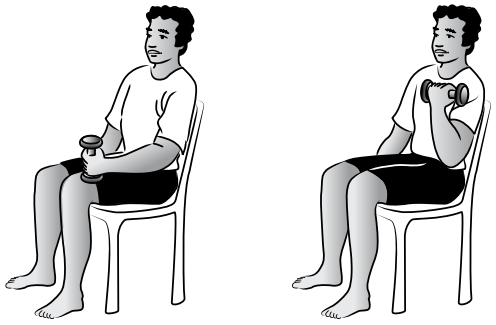
1. Place pillows against back of chair.
2. Sit in middle or towards front of chair, knees bent, feet flat on floor.
3. Lean back on pillows, in half-reclining position, back and shoulders straight.
4. Raise upper body forward until sitting upright, using hands as little as possible.
5. Slowly stand up, using hands as little as possible.
6. Slowly sit back down.
7. Keep back and shoulders straight throughout exercise.

3. Biceps curl (strengthens upper-arm muscles)

Sit in an armless chair, with your back supported by the back of the chair. Your feet should be flat on the floor, spaced apart so that they are even with your shoulders. Hold hand weights, with your arms straight down at your side, palms facing in towards your body. Take 3 seconds to lift your left hand weight towards your chest by bending your elbow. As you lift, turn your left hand so that your palm is facing your shoulder. Hold the position for 1 second. Take 3 seconds to lower your hand to the starting position. Pause, and then repeat with your right arm. Alternate until you have repeated the exercise 8–15 times on each side. Rest, and then do another set of 8–15 alternating repetitions.

Summary:

1. Sit in armless chair, with your back supported by back of chair.
2. Place feet flat on floor, even with shoulders.
3. Hold hand weights at sides, arms straight, palms in.
4. Slowly bend one elbow, lifting weight towards chest.
   (Rotate palm to face shoulder while lifting weight.)
5. Hold position.
6. Slowly lower arm to starting position.
7. Repeat with other arm.



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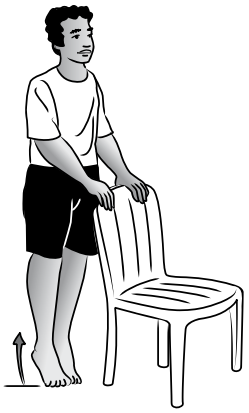
4. Plantar flexion (strengthens ankle and calf muscles)

Use ankle weights, if you are ready to. Stand straight, feet flat on the floor, holding on to the edge of a table or chair for balance. Take 3 seconds to stand as high up on your tiptoes as you can; hold for 1 second, then take 3 seconds to slowly lower yourself back down. Do this exercise 8–15 times; rest a minute, then do another set of 8–15 repetitions. As you become stronger, do this exercise first on your right leg only, then on your left leg only, for a total of 8–15 times on each leg. Rest a minute, then do another set of 8–15 alternating repetitions.

Summary:

1. Stand straight, holding table or chair for balance.
2. Slowly stand on tiptoes, as high as possible.
3. Hold position.
4. Slowly lower heels all the way back down.

Variation, as strength increases: do the exercise standing on one leg only, alternating legs.



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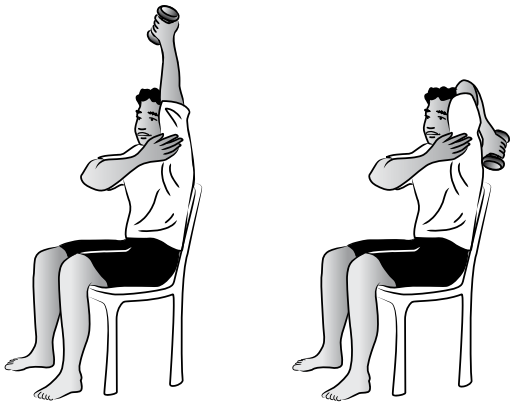
5. Triceps extension (strengthens muscles in back of upper arm)

If your shoulders aren't flexible enough to do this exercise, see alternative 'dip' exercise, below.

Sit in a chair, towards the front. Your feet should be flat on the floor, spaced apart so that they are even with your shoulders. Hold a weight in your left hand and raise your left arm all the way up, so that it's pointing towards the ceiling, palm facing in. Support your left arm by holding it just below the elbow with your right hand. Slowly bend your left arm so that the weight in your left hand now rests behind your left shoulder. Take 3 seconds to straighten your left arm so that it's pointing towards the ceiling again. Hold the position for 1 second. Take 3 seconds to lower the weight back to your shoulder by bending your elbow. Keep supporting your left arm with your right hand throughout the exercise. Pause, then repeat the bending and straightening until you have done the exercise 8–15 times with your left arm. Reverse positions and repeat 8–15 times with your right arm. Rest, then do another set of 8–15 repetitions on each side.

Summary:

1. Sit in chair, near front edge.
2. Place feet flat on floor, even with shoulders.
3. Raise one arm straight towards ceiling.
4. Support this arm below elbow, with other hand.
5. Bend raised arm at elbow, bringing hand weight towards same shoulder.
6. Slowly re-straighten arm towards ceiling.
7. Hold position.
8. Slowly bend arm towards shoulder again.



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6. Alternative 'dip' exercise for back of upper arm

Sit in a chair with armrests. Lean slightly forward, keeping your back and shoulders straight. Hold on to the arms of the chair. Your hands should be level with the trunk of your body, or slightly further forward. Place your feet slightly under the chair, with your heels off the ground and the weight of your feet and legs resting on your toes and the balls of your feet. Slowly lift yourself up, using your arms, as high as you can. This pushing motion will strengthen your arm muscles even if you aren't yet able to lift yourself up off the chair. Don't use your legs or feet for assistance, or use them as little as possible. Slowly lower yourself back down. Repeat 8–15 times. Rest; repeat another 8–15 times.

Summary:

1. Sit in chair with armrests.
2. Lean slightly forward, back and shoulders straight.
3. Grasp arms of chair.
4. Tuck feet slightly under chair, weight on toes.
5. Slowly push body off chair using arms, not legs.
6. Slowly lower to starting position.

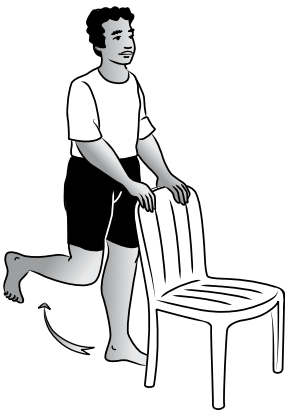
---

7. Knee flexion (strengthens muscles in back of thigh)

Use ankle weights, if you are ready to. Stand straight, very close to a table or chair, holding it for balance. Take 3 seconds to bend your left knee so that your calf comes as far up towards the back of your thigh as possible. Don't move your upper leg at all; bend your knee only. Take 3 seconds to lower your left leg all the way back down. Repeat with right leg. Alternate legs until you have done 8–15 repetitions with each leg. Rest; then do another set of 8–15 alternating repetitions.

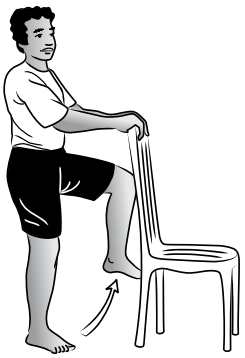
Summary:

1. Stand straight; hold on to table or chair for balance.
2. Slowly bend knee as far as possible.
3. Hold position.
4. Slowly lower foot all the way back down.
5. Repeat with other leg.



8. Hip flexion (strengthens thigh and hip muscles)

Use ankle weights, if you are ready to. Stand to the side of or behind a chair or table, holding it with one hand for balance. Take 3 seconds to bend your left knee and bring it as far towards your chest as possible. Stand straight throughout, without bending at the waist or hips. Hold position for 1 second, then take 3 seconds to lower your left leg all the way down. Repeat with right leg; alternate legs until you have done 8–15 repetitions on each side. Rest, then do another set of 8–15 alternating repetitions.



Summary:

1. Stand straight, holding tall stable object for balance.
2. Slowly bend one knee towards chest, without bending waist or hips.
3. Hold position.
4. Slowly lower leg all the way down.
5. Repeat with other leg.

---

9. Shoulder flexion (strengthens shoulder muscles)

Sit in a chair, with your back straight. Your feet should be flat on the floor, spaced apart so that they are even with your shoulders. Hold hand weights straight down at your sides, with your palms facing inwards. Take 3 seconds to lift your arms in front of you, keeping them straight and rotating them so that your palms are facing upwards, until your arms are parallel to the ground. Hold the position for 1 second. Take 3 seconds to lower your arms so that they are straight down by your sides again. Pause. Repeat 8–15 times. Rest; do another set of 8–15 repetitions.

Summary:

1. Sit in chair.
2. Place feet flat on floor, even with shoulders.
3. Arms straight down at sides, palms inwards.
4. Raise both arms in front of you (keep them straight and rotate so palms face upwards) to shoulder height.
5. Hold position.
6. Slowly lower arms to sides.

---

10. Knee extension (strengthens muscles in front of thigh and shin)

Use ankle weights, if you are ready to. Sit in a chair, with your back resting against the back of the chair. If your feet are flat on the floor in this position, you should place a rolled-up towel under your knees to lift them up. Only the balls of your feet and your toes should be resting on the floor. Rest your hands on your thighs or on the sides of the chair. Take 3 seconds to extend your right leg in front of you, parallel to the floor, until your knee is straight. With your right leg in this position, flex your foot so that your toes are pointing towards your head; hold your foot in this position for 1–2 seconds. Take 3 seconds to lower your right leg back to the starting position, so that the ball of your foot rests on the floor again. Repeat with your left leg. Alternate legs, until you have done the exercise 8–15 times with each leg. Rest, then do another set of 8–15 alternating repetitions.

Summary:

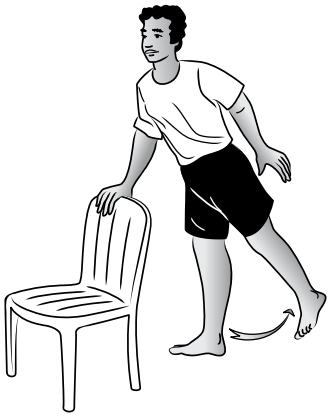
1. Sit in chair. Put rolled towel under knees, if needed.
2. Slowly extend one leg as straight as possible.
3. Hold position and flex foot to point toes towards head.
4. Slowly lower leg back down.
5. Repeat with other leg.

11. Hip extension (strengthens buttock and lower-back muscles)

Use ankle weights, if you are ready to. Stand 30–45 centimetres (12–18 inches) away from a table or chair, feet slightly apart. Bend forward from the hips, at about a 45-degree angle, holding on to the table or chair for balance. In this position, take 3 seconds to lift your left leg straight behind you without bending your knee or pointing your toes or bending your upper body any further forward. Hold the position for 1 second. Take 3 seconds to lower your left leg back to the starting position. Repeat with your right leg. Alternate legs, until you have repeated the exercise 8–15 times with each leg. Rest, then do another set of 8–15 alternating repetitions with each leg.

Summary:

1. Stand 30–45 centimetres (12–18 inches) from table.
2. Bend at hips; hold on to table.
3. Slowly lift one leg straight backwards.
4. Hold position.
5. Slowly lower leg.
6. Repeat with other leg.



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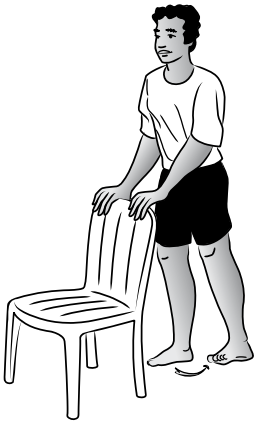
12. Side leg raise (strengthens muscles at sides of hips and thighs)

Use ankle weights, if you are ready to. Stand up straight, directly behind a table or chair, feet slightly apart. Hold on to the table to help keep your balance. Take 3 seconds to lift your right leg 15–30 centimetres (6–12 inches) out to the side. Keep your back and both legs straight. Don't point your toes outward; keep them facing forward. Hold the position for 1 second. Take 3 seconds to lower your leg back to the starting position. Repeat with your left leg. Alternate legs, until you have repeated the exercise 8–15 times with each leg. Rest; do another set of 8–15 alternating repetitions.

Summary:

1. Stand straight, directly behind table, feet slightly apart.
2. Hold table for balance.
3. Slowly lift one leg to side, 15–30 centimetres (6–12 inches).
4. Hold position.
5. Slowly lower leg.
6. Repeat with other leg.
7. Back and both knees are straight throughout exercise.



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c. Balance

Hospitals receive a lot of admissions for broken hips, and falling is often the cause of those fractures, particularly in older people. Balance exercises can help older people to stay independent by helping them avoid the disability – often permanent – that may result from falling.

As you will see, there is a lot of overlap between strength and balance exercises; very often, one exercise serves both purposes.

The lower-body exercises shown in the strength section are also balance exercises. These include plantar flexion, hip flexion, hip extension, knee flexion and side leg raise. Just do your regularly scheduled strength exercises, and they will improve your balance at the same time.

Safety

- Don't do extra strength exercises to incorporate these balance modifications – simply add the modifications to your regularly scheduled strength exercises.
- Remember that doing strength exercises too often can do more harm than good.

Progressing

These exercises can improve your balance even more if you add the following modifications:

- Note that these exercises instruct you to hold on to a table or chair for balance. Hold on to the table with only one hand.
- As you progress, try holding on with only one fingertip.
- Next try the exercises without holding on at all.
- If you are very steady on your feet, move on to doing the exercises using no hands, with your eyes closed. Have someone stand close by if you are unsteady.

Examples of strength/balance exercises

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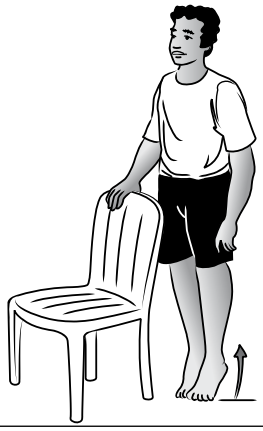
1. Plantar flexion

Plantar flexion is already included in the strength exercises. When you do your strength exercises, add these modifications to plantar flexion as you progress: hold table with one hand, then one fingertip, then no hands; then do exercise with eyes closed, if steady.

Summary:

1. Stand straight, holding on to a table or chair for balance.
2. Slowly stand on tiptoes, as high as possible.
3. Hold position.
4. Slowly lower heels all the way back down.
5. Repeat 8–15 times.
6. Rest a minute, then do another 8–15 repetitions.
7. Add modifications as you progress.



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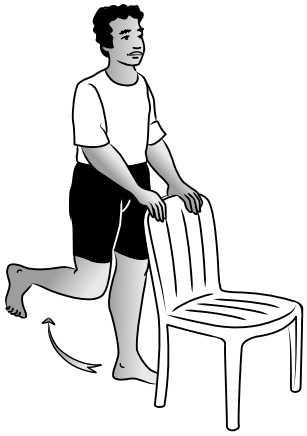
2. Knee flexion

Do knee flexion as part of your regularly scheduled strength exercises, and add these modifications as you progress: hold table with one hand, then one fingertip, then no hands; then do exercise with eyes closed, if steady.

Summary:

1. Stand straight; hold on to table or chair for balance.
2. Slowly bend knee as far as possible, so foot lifts up behind you.
3. Hold position.
4. Slowly lower foot all the way back down.
5. Repeat with other leg.
6. Add modifications as you progress.

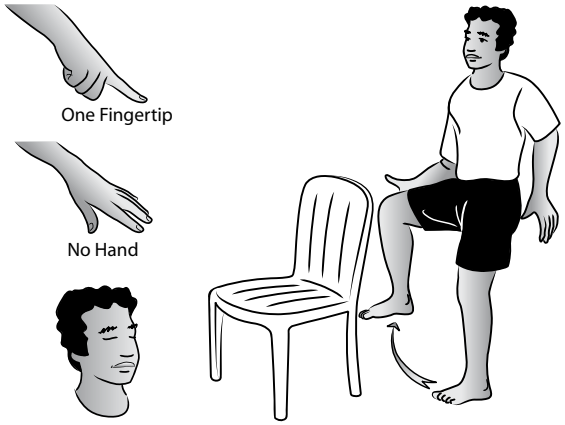


3. Hip flexion

Do hip flexion as part of your regularly scheduled strength exercises, and add these modifications as you progress: hold table with one hand, then one fingertip, then no hands; then do exercise with eyes closed, if steady.

Summary:

1. Stand straight; holding on to a table or chair for balance.
2. Slowly bend one knee towards chest, without bending waist or hips.
3. Hold position.
4. Slowly lower leg all the way down.
5. Repeat with other leg.
6. dd modifications as you progress.



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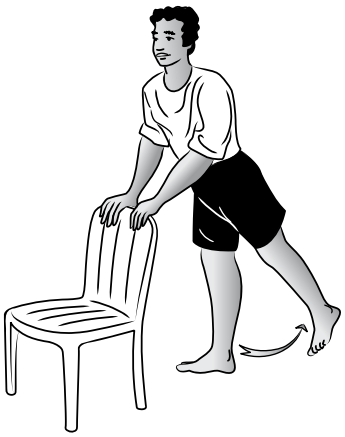
4. Hip extension

Do hip extension as part of your regularly scheduled strength exercises, and add these modifications as you progress: hold table with one hand, then one fingertip, then no hands; then do exercise with eyes closed, if steady.

Summary:

1. Stand 30–45 centimetres (12–18 inches) from table.
2. Bend at hips; hold onto table.
3. Slowly lift one leg straight backwards.
4. Hold position.
5. Slowly lower leg.
6. Repeat with other leg.
7. Add modifications as you progress.



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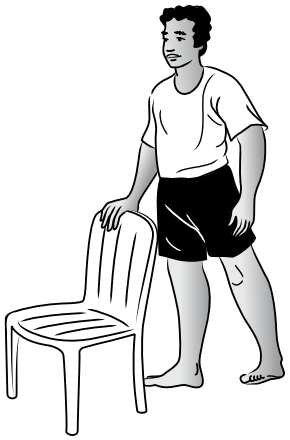
5. Side leg raise

Do leg raise as part of your regularly scheduled strength exercises, and add these modifications as you progress: Hold table with one hand, then one fingertip, then no hands; then do exercise with eyes closed, if steady.

Summary:

1. Stand straight, directly behind table or chair, feet slightly apart.
2. Hold table for balance.
3. Slowly lift one leg to side, 15–30 centimetres (6–12 inches).
4. Hold position.
5. Slowly lower leg.
6. Repeat with other leg.
7. Your back and knees are straight throughout exercise.
8. Add modifications as you progress.



6. Anytime/anywhere

The following exercises also improve your balance. You can do them almost anytime, anywhere and as often as you like, as long as you have something sturdy nearby to hold on to if you become unsteady.

Examples:

- Walk heel-to-toe. Position your heel just in front of the toes of the opposite foot each time you take a step. Your heel and toes should touch or almost touch (see illustration).
- Stand on one foot (while waiting in line at the grocery store or at the bus stop, for example). Alternate feet.
- Stand up and sit down without using your hands.

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d. Flexibility

Flexibility can be improved by stretching. Stretching exercises are thought to give you more freedom of movement to do the things you need to do and the things you like to do. Stretching exercises alone will not improve your endurance or strength.

How much, how often?

- Stretch after you do your regularly scheduled strength and endurance exercises.
- If you can't do endurance or strength exercises for some reason, and stretching exercises are the only kind you are able to do, do them at least 3 times a week, for at least 20 minutes each session. Note that stretching exercises, by themselves, don't improve endurance or strength.
- Do each stretching exercise 3–5 times at each session.
- Slowly stretch into the desired position, as far as possible without pain, and hold the stretch for 10–30 seconds. Relax, then repeat, trying to stretch further.

Safety

- Always warm up before doing stretching exercises (do them after endurance or strength exercises, for example; or, if you are doing only stretching exercises on a particular day, do a little bit of easy walking and arm-pumping first). Stretching your muscles before they are warmed up may result in injury.
- Stretching should never cause pain, especially joint pain. If it does, you are stretching too far, and you need to reduce the stretch so that it doesn't hurt.
- Mild discomfort or a mild pulling sensation is normal.
- Never 'bounce' into a stretch; make slow, steady movements instead. Jerking into position can cause muscles to tighten, possibly resulting in injury.
- Avoid 'locking' your joints into place when you straighten them during stretches. Your arms and legs should be straight when you stretch them, but don't lock them in a tightly straight position. You should always have a very small amount of bending in your joints while stretching.

Progressing

You can progress in your stretching exercises; the way to know how to limit yourself is that stretching should never hurt. It may feel slightly uncomfortable, but not painful. Push yourself to stretch further, but not so far that it hurts.

Examples of stretching exercises

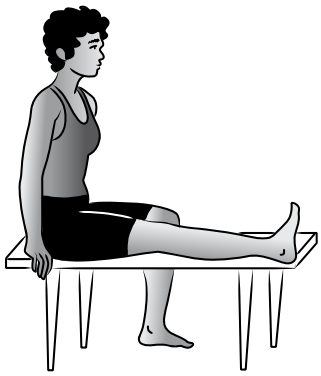
1. Hamstrings (stretches muscles in back of thigh)

Sit sideways on a bench or other hard surface (such as two chairs placed side by side) without leaning back against anything and with your back and shoulders straight. Your left leg should be resting on the bench, toes pointing up. Your right leg should be resting over the side of the bench, with your right foot flat on the floor. If your left knee is bent,

stretch to get it to lie flat on the bench. If you feel a stretch at this point, hold the position for 10–30 seconds. If your left leg is flat on the bench and you don't feel a stretch, lean forward slowly from the hips (not the waist) until you do, keeping your back and shoulders straight the entire time (note: omit this part if you have had a hip replacement – don't lean forward unless your surgeon or physical therapist approves). Stop and hold this position for 10–30 seconds. Reverse the position so that you stretch your right leg in the same way. Repeat 3–5 times on each side.

Summary:

1. Sit sideways on bench.
2. Keep one leg stretched out on bench, straight.
3. Keep other leg off bench, with foot flat on floor.
4. Straighten back.
5. Lean forward from hips (not waist) till you feel stretching in leg on bench, keeping back and shoulders straight. Omit this step if you have had a hip replacement, unless your surgeon/therapist approves.
6. Hold position.
7. Repeat with other leg.



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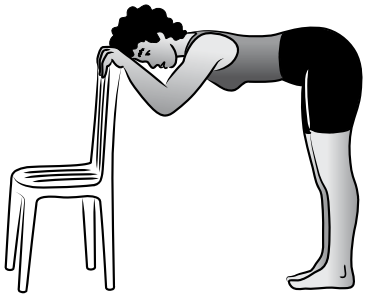
2. Alternative hamstring stretch (stretches muscles in back of thigh)

Stand behind a chair, with your legs straight. Hold the back of the chair with both hands. Bend forward from your hips (not your waist), keeping your entire back and shoulders straight the whole time, until your upper body is parallel to the floor. Don't 'hump' any part of your back or shoulders at any time. Hold position for 10–30 seconds. You should feel a stretch in the backs of your thighs. Repeat 3–5 times.

Summary:

1. Stand behind chair, holding the back of it with both hands.
2. Bend forward from the hips, keeping back and shoulders straight at all times.
3. When upper body is parallel to floor, hold position.



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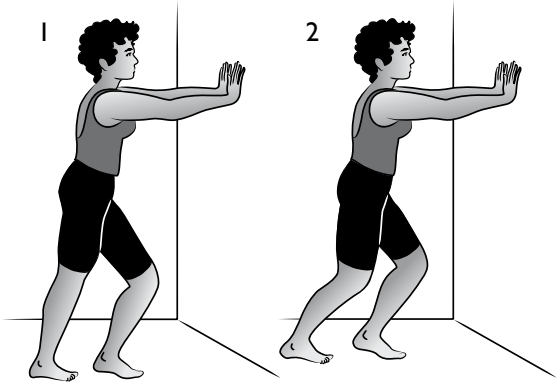
3. Calves (stretches lower leg muscles in two ways: with knee straight and knee bent)

While standing, place your hands on a wall, with arms outstretched, elbows straight. Keeping your left knee slightly bent and the toes of your right foot slightly turned inward, move your right foot back 30–60 centimetres (1–2 feet), with your right heel and foot flat on the floor. You should feel a stretch in your right calf muscle, but you shouldn't feel uncomfortable. If you don't feel a stretch, move your right foot further back until you do. Keep your right knee straight and hold that position for 10–30 seconds. Continuing to keep your right heel and foot on the floor, bend your right knee and hold for another 10–30 seconds. Repeat with your left leg. Repeat 3–5 times on each side.

Summary:

1. Stand with hands against wall, arms straight.
2. Step back 30–60 centimetres (1–2 feet) with one leg, heel and foot flat on floor.
3. Hold position.
4. Bend knee of stepped-back leg, keeping heel and foot flat on floor.
5. Hold position.
6. Repeat with other leg.



4. Ankles (stretches front ankle muscles)

Remove your shoes. Sit towards the front edge of a chair and lean back, using pillows to support your back. Slide your feet away from the chair, in front of you, so your legs are outstretched. With your heels still on the floor, point your toes away from you until you feel a stretch in the front part of your ankles. If you don't feel a stretch, lift your heels slightly off the floor while doing this exercise. Hold the position briefly. Repeat 3–5 times.

Summary:

1. Sit in chair.
2. Stretch legs out in front of you, feet off floor.
3. Bend ankles to point feet towards you.
4. Bend ankles to point feet away from you.
5. If you don't feel the stretch, repeat with your feet slightly off the floor.

---

5. Triceps stretch (stretches muscles in back of upper arm)

Hold one end of a towel in your right hand. Raise your right arm, then bend your right elbow so that the towel drapes down your back. Keep your right arm in this position, and continue holding on to the towel. With your left hand, reach behind your lower back and grasp the other end (the bottom end) of the towel. Gradually grasp higher and higher up the towel with your left hand, as high as you can. As you do this, you will find that it also pulls your right arm down. Continue until your hands touch, or as close to that as you can comfortably go. Reverse positions.

Summary:

1. Hold towel in right hand.
2. Raise and bend right arm to drape towel down back.
3. Grasp bottom end of towel with left hand.
4. Climb left hand progressively higher up towel, which also pulls your right arm down.
5. Reverse positions.

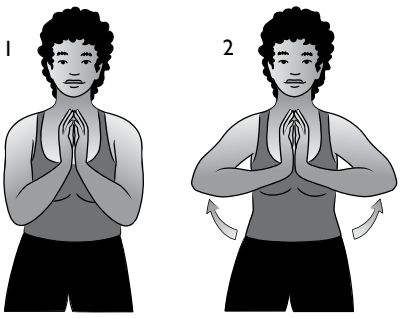
---

6. Wrist stretch

Press your hands together, elbows down. Raise your elbows as nearly parallel to the floor as possible, while keeping your hands together. Hold for 10–30 seconds. Repeat 3–5 times.

Summary:

1. Place hands together, in praying position.
2. Slowly raise elbows so arms are parallel to ground, keeping hands flat against each other.
3. Hold position for 10–30 seconds.
4. Repeat 3–5 times.



7. Quadriceps (stretches muscles in front of thighs)

Lie on your left side, on the floor. Your hips should be lined up so that the right one is directly above the left one. Rest your head on a pillow or on your left hand. Bend your right knee, reach back with your right hand, and hold on to your right heel. If you can't reach your heel with your hand, loop a belt over your right foot. Pull slightly (with your hand or with the belt) until the front of your right thigh feels stretched. Hold the position for 10–30 seconds. Reverse position and repeat with other leg. Repeat 3–5 times on each side. If the back of your thigh cramps during this exercise, stretch your leg and try again, more slowly.

Summary:

1. Lie on side.
2. Rest head on pillow or hand.
3. Bend the knee that is on top.
4. Grab heel of that leg.
5. Gently pull that leg until front of thigh stretches.
6. Hold position.
7. Reverse position and repeat

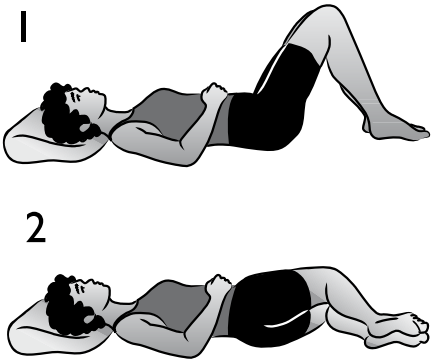
---

8. Double hip rotation (stretches outer muscles of hips and thighs)

Lie on your back, knees bent and feet flat on floor. Keeping your shoulders on the floor, with your knees bent and together, gently lower both knees to one side as far as possible without forcing them. Hold the position for 10–30 seconds, then bring your knees back to the centre and repeat on the opposite side. Repeat 3–5 times on each side.

Summary:

1. Lie on floor, knees bent.
2. Keep shoulders on floor at all times.
3. Keeping knees together, lower legs to one side.
4. Hold position.
5. Return legs to upright position.
6. Repeat towards other side.



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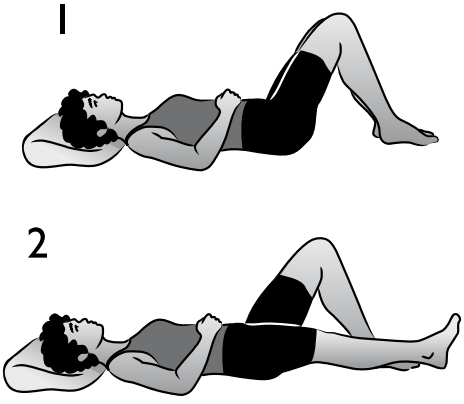
9. Single hip rotation (stretches muscles of pelvis and inner thigh)

Lie on your back and bend your knees. Let your right knee slowly lower to the right, keeping your left leg and your pelvis in place. Hold the position for 10–30 seconds. Bring your right knee slowly back to place. Repeat the exercise with your left leg. Repeat 3–5 times on each side. Keep your shoulders on the floor throughout the exercise.

Summary:

1. Lie on floor.
2. Bend knees.
3. Let one knee slowly lower to side.
4. Hold position.
5. Bring knee back up.
6. Keep shoulders on floor throughout exercise.
7. Repeat with other knee.

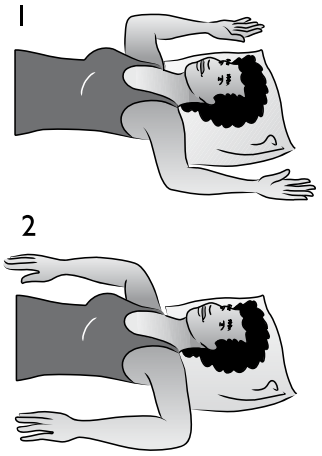


10. Shoulder rotation (stretches shoulder muscles)

Lie on the floor with a pillow under your head, legs straight. If your back bothers you, place a rolled towel under your knees. Stretch your arms straight out to the side, on the floor. Your upper arms will remain on the floor throughout this exercise. Bend at the elbow so that your hands are pointing towards the ceiling. Let your arms slowly roll backwards from the elbow. Stop when you feel a stretch or slight discomfort, and stop immediately if you feel a pinching sensation or a sharp pain. Slowly raise your arms, still bent at the elbow, to point towards the ceiling again. Then let your arms slowly roll forwards, remaining bent at the elbow, to point towards your hips. Stop when you feel a stretch or slight discomfort. Alternate pointing above your head, then towards the ceiling, then towards your hips in this manner. Begin and end with the pointing-above-the-head position. Hold each position for 10–30 seconds. Keep your shoulders flat on the floor throughout. Repeat 3–5 times.

Summary:

1. Lie flat on floor, pillow under head.
2. Stretch arms out to side.
3. Bend elbows to crook lower arms upward, at right angle.
4. Hold position.
5. Bend elbows to crook lower arms downward, at right angle.
6. Hold position.
7. Keep shoulders flat on floor throughout.



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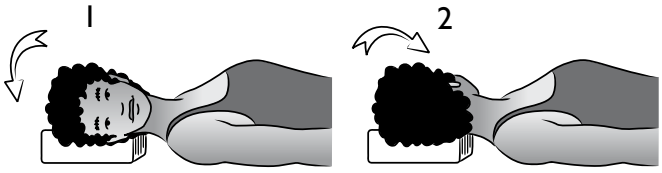
11. Neck rotation (stretches neck muscles)

Lie on the floor with a phone book or other thick book under your head, then slowly turn your head from side to side, holding position for 10–30 seconds on each side. Your head should not be tipped forward or backward, but should be in a comfortable position. You can keep your knees bent to keep your back comfortable during this exercise. Repeat 3–5 times.

Summary:

1. Lie on back.
2. Turn head from side to side, holding position each time.



e. Summary

Build up to all exercises and activities gradually, especially if you have been inactive for a long time. Once you have built up to a regular schedule, include these four types of exercises – endurance, strength, balance and stretching – whether you use the examples here or others. If you have to stop exercising for more than a few weeks, start out at half the effort when you resume, then build back up to where you were. When bending forward, always keep your back and shoulders straight to ensure that you are bending from the hips, not the waist. If you have had a hip replacement, check with your surgeon before doing lower body exercises.

ENDURANCE

To build stamina, you can do specific exercises, like walking or jogging, or any activity that raises your heart rate and breathing for extended periods of time.

- Do at least 30 minutes of endurance activities on most or all days of the week.
- If you prefer, divide your 30 minutes into shorter sessions of no less than 10 minutes each.
- The more vigorous the exercise, the greater the benefits.
- Warm up and cool down with a light activity, such as easy walking.
- Activities shouldn't make you breathe so hard you can't talk. They shouldn't cause dizziness or chest pain.
- When you are ready to progress, first increase the amount of time, then the difficulty, of your activity.
- Stretch after endurance exercises.

STRENGTH

- Do strength exercises for all your major muscle groups at least twice a week, but not for the same muscle group on any two days in a row.
- Gradually increasing the amount of weight you use is the most important part of strength exercises.
- Start with a small amount of weight (or no weight) and increase it gradually.
- When you are ready to progress, first increase the number of times you do the exercise, then increase the weight at a later session.
- If you can't lift a weight more than 8 times, it's too heavy; if you can lift it more than 15 times, it's too light.
- Do an exercise 8–15 times, rest a minute and repeat it 8–15 more times.
- Take 3 seconds to lift and 3 seconds to lower weights. Never jerk weights into position.
- Avoid holding your breath while straining.
- These exercises may make you sore at first, but they should never cause pain.
- Stretch after strength exercises.

BALANCE

- Add the following modifications to your regularly scheduled lower-body strength exercises:
- As you progress, hold on to the table or chair with one hand, then one finger. If you are steady on your feet, progress to no hands and eyes closed. Ask someone to watch you the first few times, in case you lose your balance.
- Don't do extra strength exercises to add these balance modifications. Simply add the modifications to your regularly scheduled strength exercises.
- Another way to improve your balance is through 'anytime, anywhere' balance exercises. One example: balance on one foot, then the other, while waiting for the bus. Do this as often as desired.

STRETCHING

- Stretching exercises may help keep you flexible.
- Stretching exercises alone will not improve endurance or strength.
- Do stretching exercises after endurance and strength exercises, when your muscles are warm.
- If stretching exercises are the only kind of exercise you are able to do, do them at least 3 times a week, up to every day. Always warm up your muscles first.
- Do each exercise 3–5 times at each session.
- Hold the stretched position for 10–30 seconds.
- Total session should last 15–30 minutes.
- Move slowly into position; never jerk into position.
- Stretching may cause mild discomfort, but should not cause pain.