

RESEARCH INTO Ageing

Research into Ageing is the national medical research charity committed to improving the health and quality of life of older people.

The charity pursues this goal through the initiation, funding and support of medical research at universities, hospitals and medical schools throughout the UK. The aim of the research is to prevent, more effectively treat and ultimately eliminate the debilitating conditions that destroy quality of life, creating a downward spiral to dependence.

Research into dementia, including Alzheimer's disease, incontinence, osteoporosis, impaired vision, immobility and the ageing process itself is currently being funded.

Research into Ageing relies entirely on corporate and individual donations, covenants and legacies, grants from trusts and income from local and national fund-raising events. The charity does not receive any funding for its research programme from Government or other central sources.

Medical research holds the key to improving health in later life.
You can help Research into Ageing turn the key by making a donation,
covenanting a regular amount, or remembering us in your Will.



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RESEARCH INTO Ageing

EXERCISE FOR HEALTHY AGEING

Dr Dawn Skelton



Exercise programmes
proven in research
to increase muscle strength

REVISED & EXPANDED
SECOND EDITION

EXERCISE FOR HEALTHY AGEING

Healthy older individuals lose strength at 1 to 2 per cent per year, and power (how fast strength can be exerted) often declines even faster, at some 3 to 4 per cent per year. If, added to this natural loss, older people experience illness or surgery, that decline in strength and power can increase dramatically. Periods of immobility can leave older people too weak to carry out the basic tasks for everyday living, or prone to the very real threat of frequent falls and possible fractures. However, the good news is that it's never too late to increase strength, flexibility and balance, through planned exercise.

This book provides a graduated programme of planned exercise to suit everyone who has either been immobile for a period, or who has not taken exercise in the recent past. The programme has been devised by Dr Dawn Skelton and is partly based on a research study funded by Research into Ageing at the Royal Free Hospital, London. During this project, a group of women aged 75-93 improved the strength of their thigh muscles by on average 25 per cent in only 12 weeks of regular exercise. This is equal to a rejuvenation of strength of some 16-20 years.

Staying active can help you maintain strength and power and to stay independent.

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MARKS & SPENCER

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This book is the direct result of research carried out by Dr Dawn Skelton at the Royal Free Hospital Medical School, under the supervision of Professor Archie Young, which was sponsored by the Headley Trust.

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Surplus funds generated by this book are being invested in Research into Ageing's work to help improve the quality of later life for everyone.

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Before you start exercising, it is recommended that you speak to your doctor

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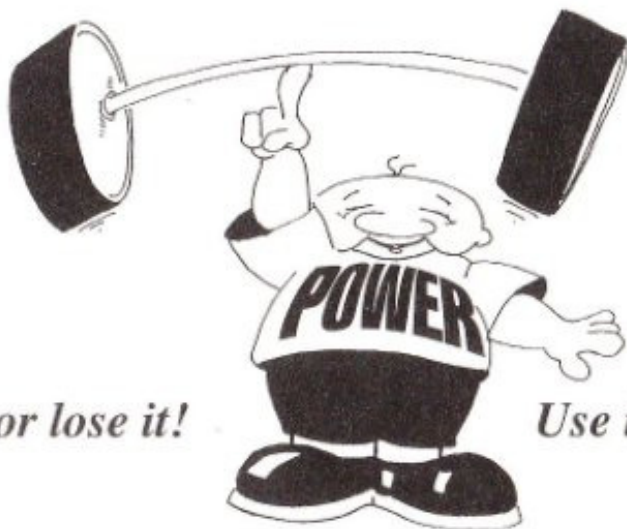
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Use it or lose it!

Use it and improve it!

WHY EXERCISE?

Many older people have difficulty carrying out everyday tasks. Getting in and out of the bath, climbing stairs or getting off the floor may present almost insurmountable obstacles. If these tasks are not yet difficult or tiring, there is still a case to start exercising *now*.

For even healthy older people lose strength at some 1-2 per cent per year, and power (how fast you can exert your strength) may decline even faster at some 3-4 per cent per year.¹ Prolonged illness can exacerbate the problem for some.

Without some form of exercise, muscle power and strength declines, making everyday tasks more difficult. Without some form of exercise, the risk of falls and fractures increases dramatically.

When it comes to preventing these problems, however, the good news is, **it's never too late**.

A recent study has shown that women aged 79-93, regularly exercising for a total of three hours per week, improved the strength of their thigh muscles by around 25 per cent in only 12 weeks.² This is

equivalent to a rejuvenation of strength of some 16-20 years. Another project showed dramatic improvement in balance, flexibility and strength in just 8 weeks.³

A commitment to **stay active** is therefore an investment to help you **stay independent**.

There are other benefits too.⁴ Exercise decreases muscular tension and joint pain. It is helpful in the prevention of falls, broken bones and osteoporosis. Exercise increases circulation and can prevent or lessen the effects of heart disease. It can aid in the treatment of diabetes and Parkinson's disease. Exercise can also help with bowel movements and incontinence.

On a psychological note, it can heighten alertness, combat insomnia, increase self-confidence and alleviate depression.

- 1 Skelton D.A. *et al.* Strength, power and related functional ability of healthy people aged 65-89 years. *Age & Ageing* 23: 371-377, 1994
- 2 Skelton D.A. *et al.* Muscle strength and power after strength training by women aged 75 and over - a randomised, controlled study. *J. Physiol.* 473:83p, 1993
- 3 Skelton D.A. & McLaughlin A.W. Training functional ability in old age. *Physiotherapy* 82(3): 159-167, 1996
- 4 Fentem, P.H. *et al.* *The new case for exercise*. The Health Education Authority and the Sports Council, London, 1988

GETTING GOING

Before you start, it is important that you speak to your doctor about exercise. He or she will be able to check for any condition which would make certain forms of exercise unwise. Choose from a wide variety of exercise activities. It is important to remember that everyone is different, and that an exercise which suits one person may not suit you. Take your time in choosing which type of exercise and it is likely that you will get the best results.

Invest in some good soft-soled shoes (trainers) and loose (preferably cotton) clothing. If you join an exercise class, make sure you choose one where you feel comfortable, that fits your capabilities and has a trained teacher. Your local council will have a list of all over-fifties or senior citizen classes (including bowling, Tai Chi, swimming and rambling associations) and

may have a yearly reduced rate scheme.

For some people, exercising at home is more enjoyable. But to reap the benefits of exercise, you must first expend a little effort! Remember that whatever exercise you choose should be fun, and your efforts should never be so extreme that exercise is anything but a pleasure.



THE HOME ROUTINE

The benefit of exercising at home is that you can choose when, how, at what pace and even to what music you work. Also, if you have been very inactive, you can start very slowly without being concerned about competition from other exercisers. The exercises detailed here are designed to help maintain or improve your mobility and ability to carry out everyday tasks.

The exercises are simplified into three sections: beginners, intermediate and advanced. But later sections offer variety for specific areas of the body and prevention of falls.

You should start on the Beginners section and unless these are very easy you should spend 4 to 6 weeks on this section. Start by doing 5-10 repetitions of the exercise. When you can do 10, work up to the following plan: 5 repetitions (known as a set) - Rest - Repeat set twice (that is 15 repetitions in total). Work up to increase the number of repetitions to 8 in each of the three sets.

When this becomes easy, use resistance or weight in the exercise, or move on to the next section.

You should spend 4 to 6 weeks on the Intermediate section using the same repetitions and sets before you move on to the Advanced, perhaps adding a few of the beginner's exercises to vary your regimen. Use the worksheet at the back of the book to record your progress. You may also want to try some of the exercises for specific areas of the body or for prevention of falls.

You may want to find a regular class to attend that will tax your body a bit more, or just mix the exercises and spend longer each session. If you are concerned about floor exercises, get a friend to join you during your sessions. Good posture and an effective warm-up and stretch (*see pp. 10-13*) are essential to safe exercise and are particularly important if you are exercising at home without supervision.

GUIDELINES FOR EXERCISE

If you have not exercised for a long time then start by being a bit more active every day. Use the stairs instead of the lift, walk to the shops rather than get the bus. Don't rush into exercise, start gently. Remember to set yourself realistic and achievable short-term goals; try a little more each day; build up gradually and get support from those around you - perhaps by asking a friend to join in.

For the greatest health benefits, the Health Education Authority (HEA) have suggested that 30 minutes of moderate exercise, five times a week is best. At first, try to exercise regularly (at least three times per week) at least 10 minutes for each session, leading up to 20 minutes and then 30 minutes. As you become stronger, push yourself a little harder.



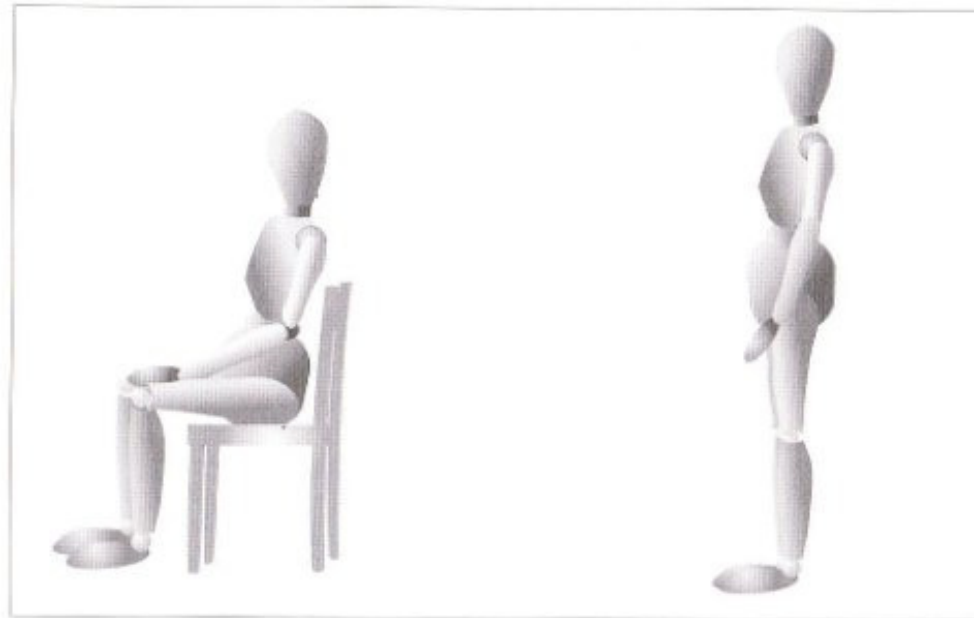
While exercise is generally a safe activity, there are a few important points which you should remember ▶

Guidelines for exercise

1. Don't exercise if you are tired, unwell, or have just eaten.
2. Wear loose clothing and soft-soled shoes.
3. Start with a good posture and keep checking it.
4. Remember to breathe properly. Don't hold your breath while doing any movement.
5. Always do some kind of warm-up and stretch first to avoid injury to the muscles.
6. Do the exercises slowly and with control.
7. At no time should an exercise cause pain. If it does, stop immediately and substitute another exercise.
8. It is not unusual to feel a bit stiff and tired after the first few periods of exercise. If this continues, speak to your doctor.
9. If you feel any dizziness, nausea, pain, cold sweats or excessive stiffness or tiredness, stop exercising immediately and speak to your doctor.
10. To protect vulnerable areas like knees and back, use a pillow to rest on.
11. Don't turn the head sharply and don't tip your head back to look towards the ceiling. These movements can cause dizziness.
12. Always feel the chair behind your knees before you sit down.
13. When doing standing exercises, stand close to a chair in case you need to sit down or balance yourself.
14. Try to exercise on the floor so you practise how to rise if you fall.
15. Make sure you exercise in a clear area with no obstacles on the floor.

GOOD POSTURE

Good posture is essential to safe exercise and should be continued into daily life. It will help you avoid falls and injury, particularly to the back and hips. For correct standing posture, you should have your feet slightly apart with your hips centred under your shoulders and pelvis tilted slightly back. Keep your stomach muscles taught and allow your spine to feel long and strong. Shoulders should be down and relaxed.



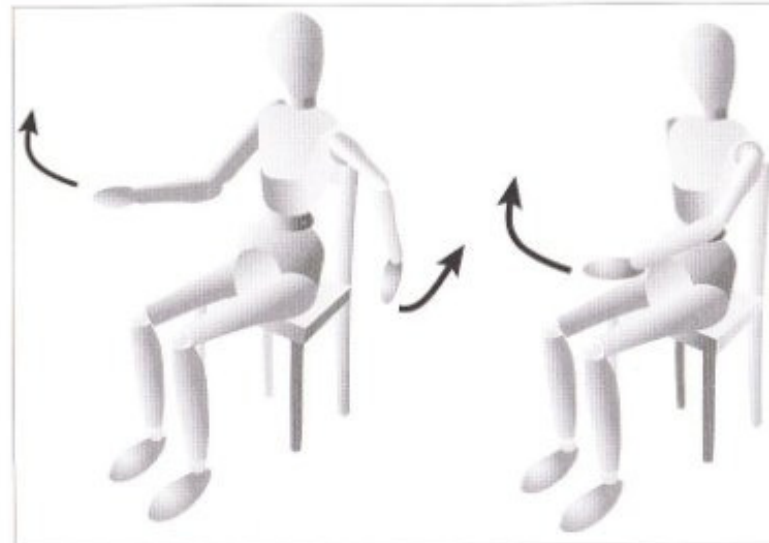
▲ When seated, you should be sitting forward in your chair with your legs comfortably separated. You should have a straight back and your feet should be directly under your knees. Try to keep the chest high, the shoulders back and down and the head facing forwards. Imagine there is a piece of string attached to your head keeping the neck long and straight.

WARMING-UP AND COOLING-DOWN

A brief warm-up and stretch improves performance and can help prevent injury. If you have to stop exercising for any reason and go back to it later, always do the warm-up again. Do each warm-up exercise, detailed here, for about a minute.

You should aim to feel warm before you go on to the exercises in the following sections. You may feel dizzy if you stop exercising suddenly, so slow down gradually after the exercises by repeating one or two of these warm-up exercises.

Exercise 1



Seated securely, with your back away from the chair, swing your arms gently by your sides, from the shoulder.

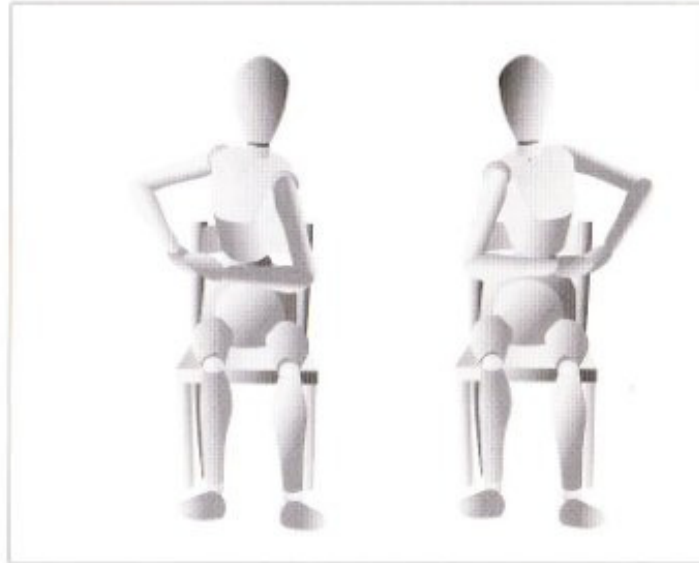
12 Warm-up/cool-down

Exercise 2



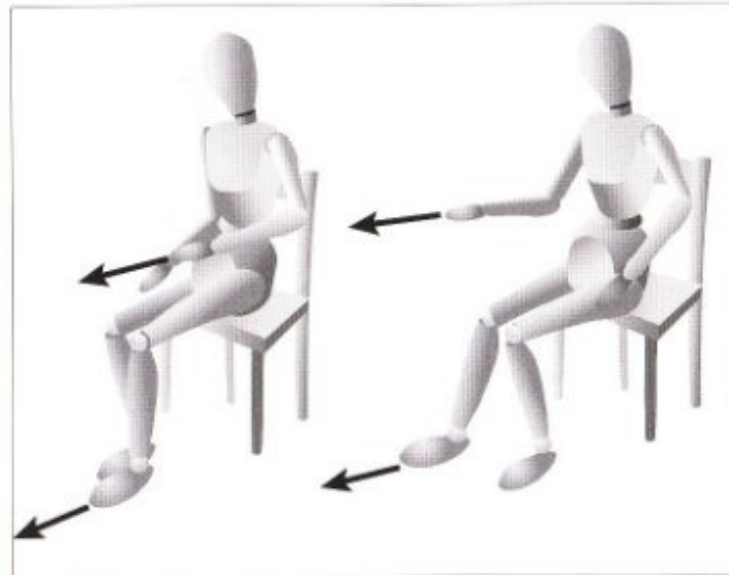
Seated, with your arms at your side in line with your hips, bend gently to one side keeping the head and neck in line with your spine. Try to keep your back long and your tummy tight. Repeat 5-10 times each side.

Exercise 3



Seated, with your hands and elbows just above stomach level, twist your whole upper body to your right, back to centre, and then twist slowly to your left and back to centre. Keep your back long and your tummy tight. Move your head in line with your body. Repeat 5-10 times each side.

Exercise 4

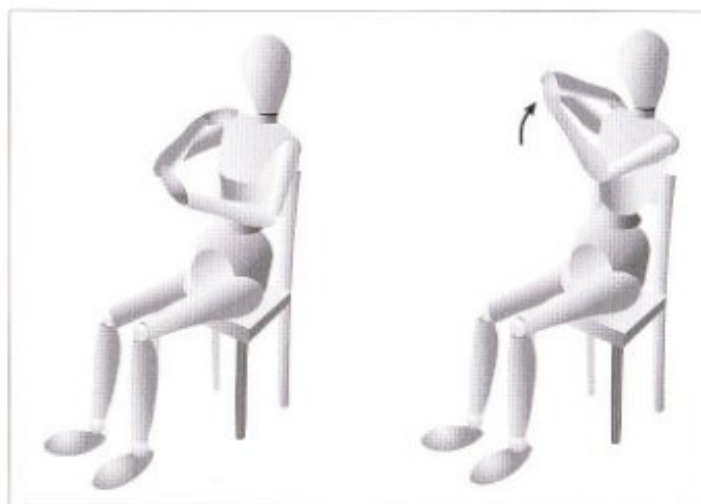


Start sitting at the back of your chair and 'wiggle' yourself to the front of the chair and then back again. Lift your hips and buttocks as you 'wiggle' forward and back and bring your arms into the movement for a total body 'wiggle'. Repeat for about one minute.

THE BEGINNER'S PROGRAMME

If you have not exercised for a while, and especially if you are new to vigorous activity, this routine is for you. Many of these exercises require a chair. A chair with no arm rests is preferable. Remember, always **warm-up** (see pages 11-13).

Exercise 5



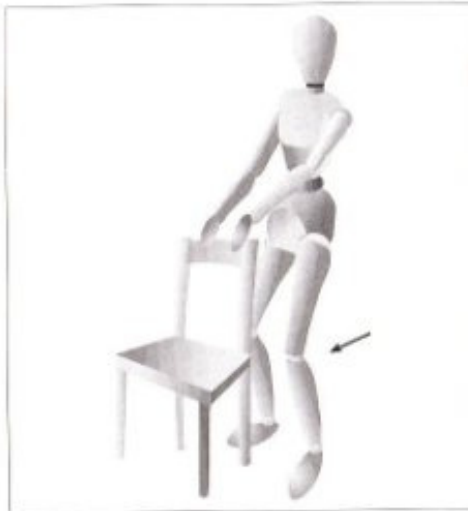
Bend your right arm and touch your right shoulder with the right hand. With your left hand, raise your right elbow slightly, towards the ear. Feel your right hand moving over the shoulder and down towards the shoulder blade. Try to go a little further each time. Do this 5-10 times, rest and then repeat.

Exercise 6



Seated at the front of the chair, keep one knee bent and straighten the other. Place your hands on the bent knee and bend gently forward keeping your back straight and your head in line with your spine. Hold for a slow count of four. Repeat 5-10 times and then change legs.

Exercise 7



Stand with your feet hip width apart and your toes facing forward. Keeping your back upright and heels on the floor, bend the knees slightly, making sure your feet are in line with your hips. Hold for a slow count of four then repeat 5-10 times.

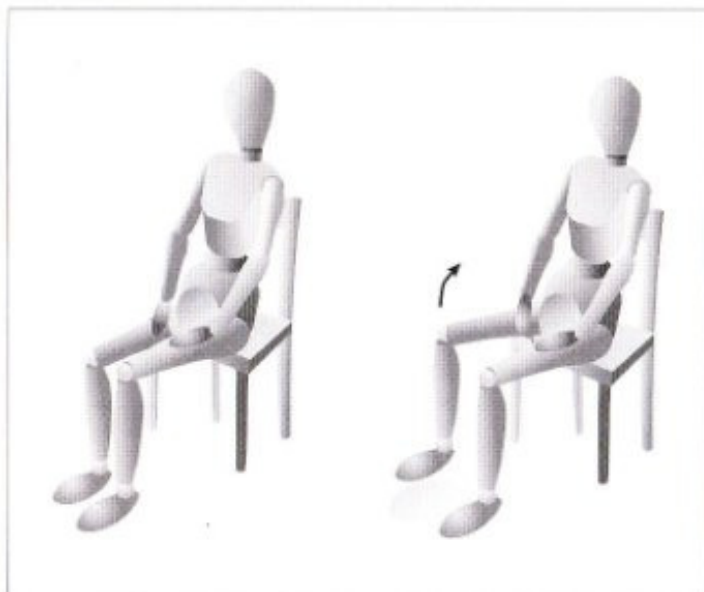
Exercise 8



Place your hands on your lap and then slowly circle the shoulders, first forwards twice then backwards twice. As you circle your shoulders, feel your shoulder blades coming closer together and try to touch your ears with your shoulders.

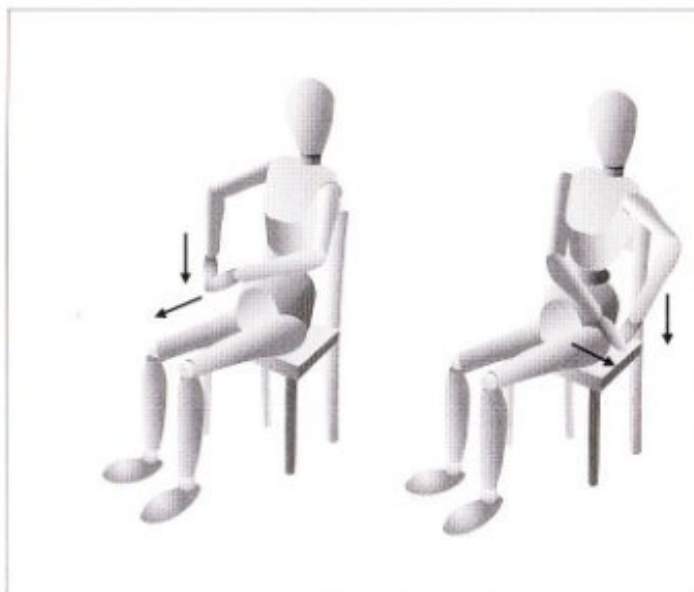
16 Beginners' programme

Exercise 9



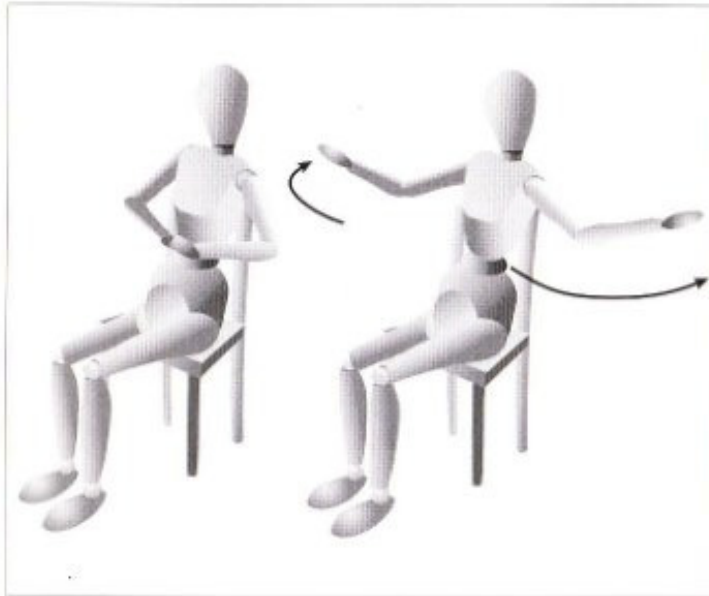
Sitting with your back straight, slowly raise one knee so the foot is 2-4 inches off the floor. Hold for a slow count of four, slowly lower the leg and repeat 5-10 times. Repeat with the other leg.

Exercise 10



Seated, with your back supported by the chair, do a movement with your arms like a canoeist, first one side and then the other. Feel the resistance of the 'air' as you push through it with your arms acting as a paddle. Repeat the total movement 5-10 times.

Exercise 11



Leaning against the back of the chair, with elbows raised and fingers touching together and against the chest, open the arms out and **slowly** take them behind, as far as they can go. Repeat 5-10 times.

Exercise 12



Sitting forward in the chair, lift one knee slightly until the foot is off the floor. Circle the ankle very slowly clockwise and anti-clockwise, moving through your whole range of movement. Repeat with the other leg. Alternatively, you could cross your legs and let your ankle hang freely before circling it.

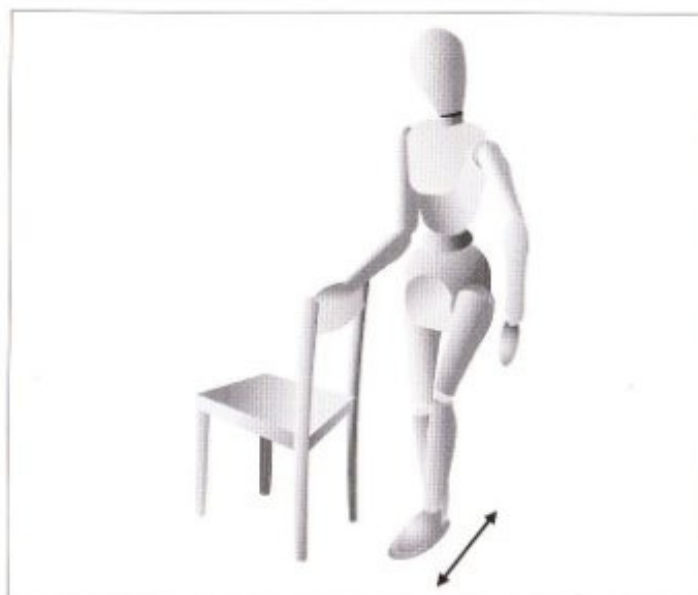
18 Beginners' programme

Exercise 13



Sitting forward away from the back of the chair, place your hands on your shoulders so that the elbows are bent. Make large circles with the elbows first forwards and then back. Feel your shoulder blades getting closer together. Repeat 5-10 times in each direction.

Exercise 14



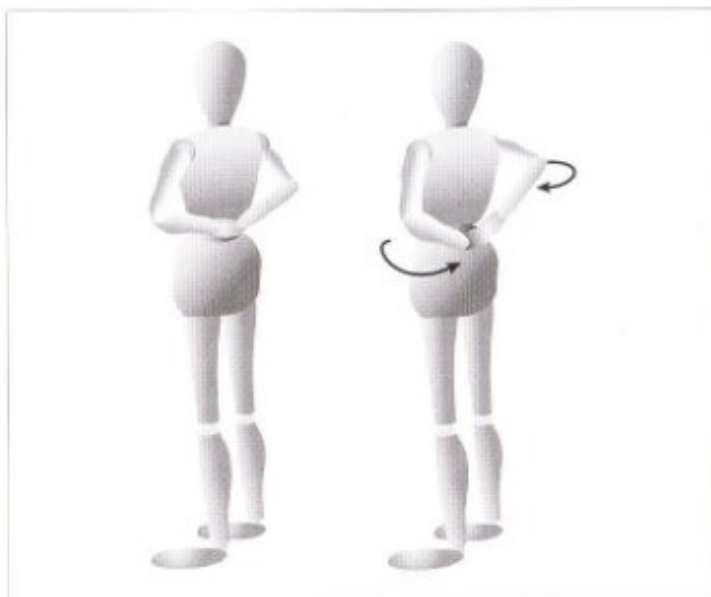
Standing holding on to a chair for support, gently swing your leg forwards and back. Feel the hip moving gently, try a few larger swings for up to one minute, then change sides and repeat.

Remember to cool-down using exercises 1-4

THE INTERMEDIATE PROGRAMME

After 4-6 weeks of regular exercise using the beginners' routine, you will probably be ready for the intermediate programme. This routine is more challenging than the beginners' programme, so start gently and gradually work harder as time goes by. As before **always warm-up** (*see* pages 11-13), then do each exercise 5-10 times with brief rests in between.

Exercise 15



Standing, clasp your hands behind you in the small of your back. Keeping the shoulders down, try to get your shoulder blades as close as possible, and stretch the chest by squeezing together the elbows.

Exercise 16



Holding on to a chair for support, ease one leg behind you keeping the knee straight and bend the other one slightly so that you can ease the heel of your straight leg toward the floor until you feel a stretch. Hold for a count of 5 and repeat with the other leg.

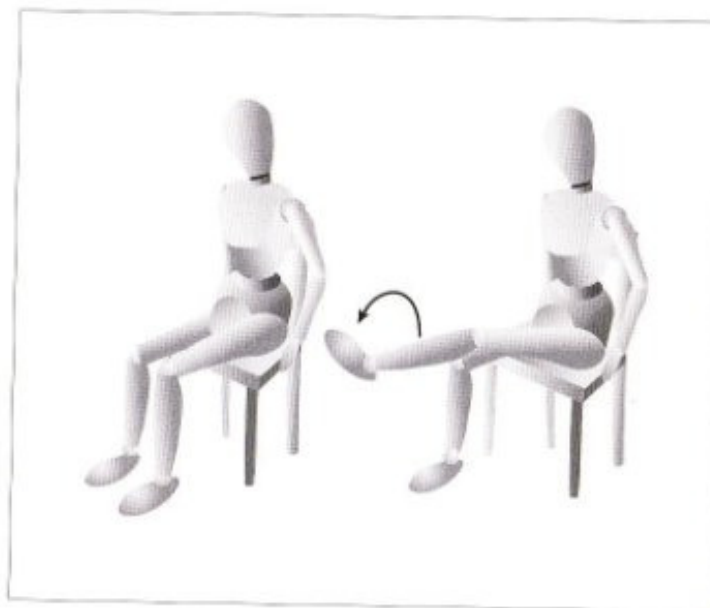
20 Intermediate programme

Exercise 17



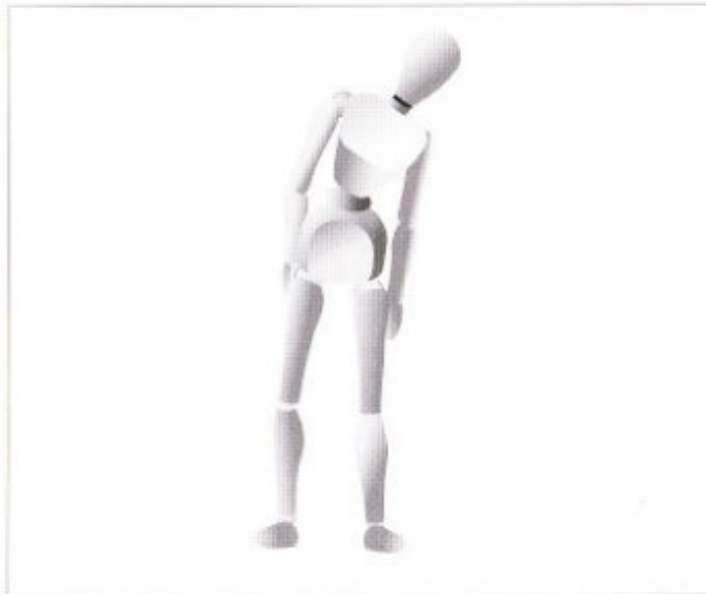
Seated, with elbows at your side and hands at shoulder height, slowly raise one hand toward the ceiling, stretching your fingers toward the ceiling, then repeat, raising the other hand. Repeat the overall movement 5-10 times.

Exercise 18



Seated, with hands holding the sides of the chair, cross one leg over the other slowly. Count to three and change legs. Repeat 5-10 times.

Exercise 19



Slowly bend to the left, sliding the left hand down the side of the thigh to the knee. Keep the head in line with the spine, try not to twist and keep the knees loose rather than straight. Bend to the other side. Repeat both sides 5-10 times.

Exercise 20



March briskly on the spot, and if your balance is good, round the room, lifting knees high and using the arms vigorously. Continue **power walking** for no more than two minutes, but slow down first. *Never stop suddenly* and have a chair nearby for support if necessary.

22 Intermediate programme

Exercise 21



Facing your chair and keeping your back straight, bend the knees slightly and clasp both sides of the chair seat with both hands. Bend one knee and start lowering yourself to the floor on the other. (Use a cushion if you have sore knees.) Support yourself to the floor by using your arms. Reverse the movement and stand up again. Repeat as long as you are not at all 'light-headed'.

Exercise 22



Seated, with your arms crossed over the chest and your feet slightly closer to the chair than your knees. Lean forward and stand up slowly keeping your back straight. Before sitting, make sure the chair is touching the back of the knees. If you find this very difficult, then push up with your arms on your knees, then try using only one arm for support.

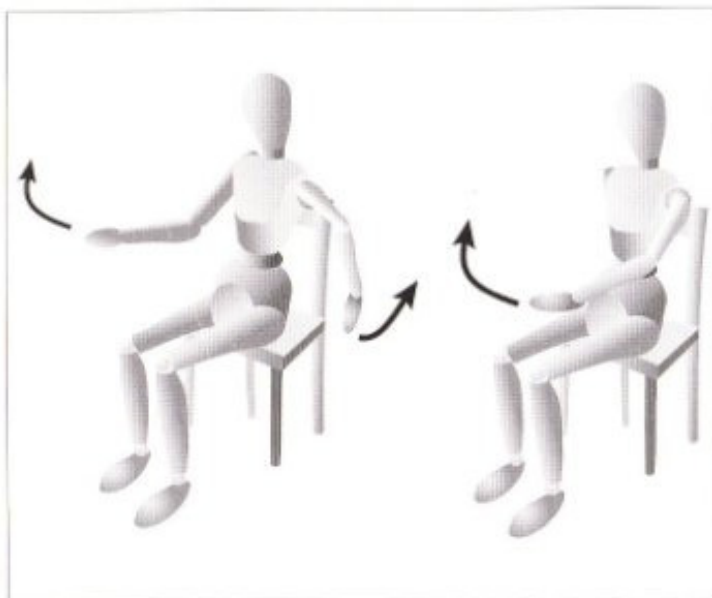
THE ADVANCED PROGRAMME

You should graduate through the Beginners' and Intermediate routines before attempting the advanced programme. As always, remember to warm-up and cool-down **before and after** each exercise session, gradually trying to work a little harder each time. Do each exercise 5-10 times with brief rests in between and work up to 5 repetitions and 3 sets, perhaps including some exercises from the other sections. Floor work is prominent in this section because it is vital to practise this task in case of a non-injurious fall.

Now warm-up!

Two particularly important warm-up and mobility exercises are repeated here for clarity.

Exercise 23



Seated, with your back away from the chair, swing your arms gently by your sides, from the shoulder.

Exercise 24

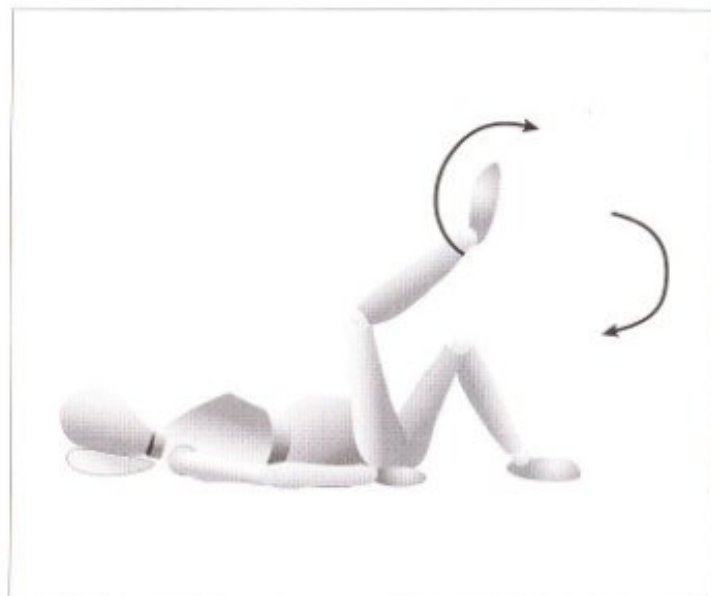


Standing, holding on to a chair for support, gently swing your leg forwards and back. Feel the hip moving gently, but try a few larger swings for up to one minute, then change sides and repeat.

24 Advanced programme

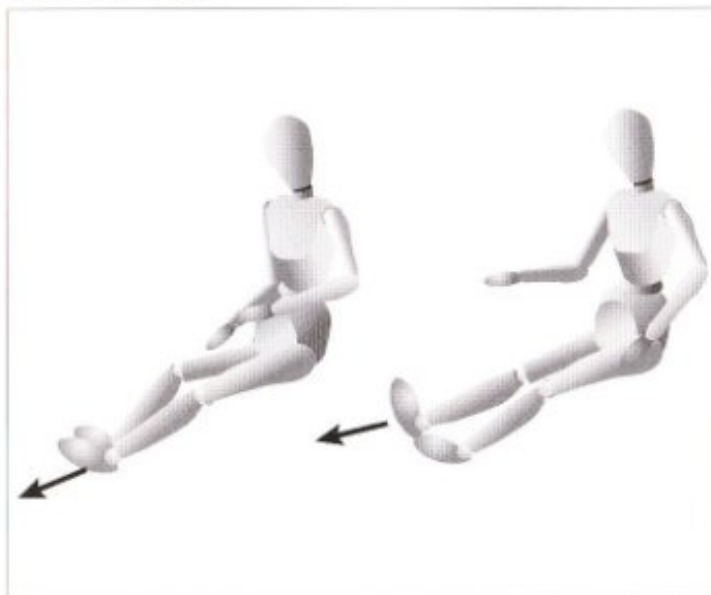
If you are reluctant to get down on the floor, or have not been down on the floor for some time, **consult page 45**, which has detailed instructions on getting down to the floor and **page 27** for rising again. This lowering and rising exercise is a useful routine to practice in its own right, in case you experience a fall without serious injury, and need a safe way of rising.

Exercise 25



Get down safely on to the floor. Lying on your back with a pillow supporting your head, support your back by putting your hands under your bottom. Bend one knee and rest the foot on the floor. With the other leg, perform a cycling movement for up to one minute. Repeat with the other leg.

Exercise 26



Sit on the floor with your legs straight out in front of you. Wiggle yourself forwards just on one buttock and then on the other, taking alternate legs and buttocks off the floor. Keep your back straight. Wiggle backwards in the same manner and repeat 5-10 times.

Exercise 27



Lying down on your side with the lower leg slightly bent to support your body, and the top leg slightly bent too, slowly lift the top leg 3-5 inches off the floor. Lower leg slowly, keeping the toes pointed. Repeat 5-10 times with each leg.

EXTENDING YOURSELF

Elastic tubing is an excellent way of increasing the resistance and thereby difficulty of an exercise. It can be bought as single bands from most sports shops (Dynabands) or in larger quantities and in different strengths (Therabands) from Ways and Means (part of Nottingham Rehabilitation, address at end of booklet). Pairs of tights can also be used regularly, or in an emergency! You can either add the tubing to the exercises already featured, or perhaps try the following exercises. **Always remember to warm-up and cool-down.** Remember not to hold your breath and breathe out during effort.

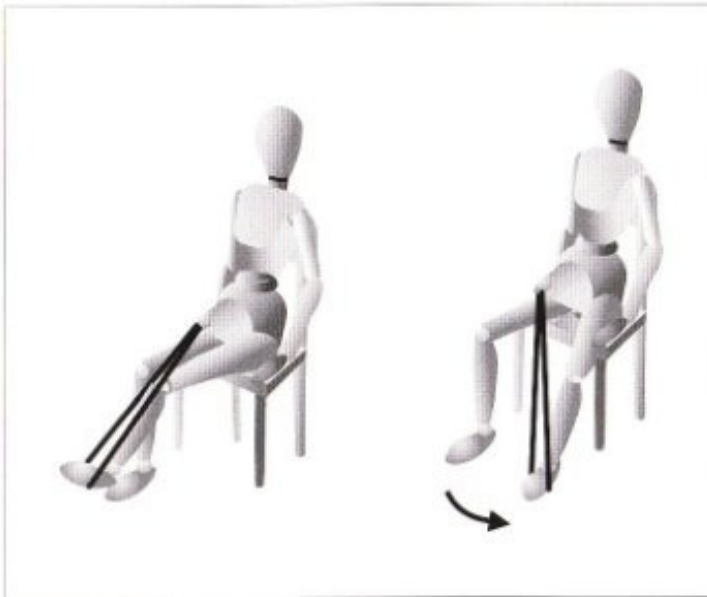
Exercise 31



Stand with the tubing placed under the feet, one hand securely holding the tubing at the hip. With the other hand, palm upwards and keeping the elbow close to the body, pull the

tubing up towards the shoulder. return the hand slowly to the hip making sure you keep your wrist straight. Repeat 5-10 times with each arm.

Exercise 32



Place the tubing around one foot, straighten that leg and secure the ends of the tubing at the hip of the opposite leg. Slowly take the leg away from the body and then bring it back in front of you, keeping the tubing taut. Repeat on both legs 5-10 times.

Exercise 33



Place the tubing under the chair and hold on to each end. Place one hand on the hip, making the tubing secure. With the other hand, palm facing forward and keeping the elbow close to the body, pull the tubing up towards shoulder height. Slowly bring the hand back to hip level and repeat on the other side. Try to keep your wrists rigid.

30 Extending yourself

Exercise 34



Seated, with your back supported by the back of the chair, circle the elastic tubing around the thigh near to the knees and hold on to the crossed over ends securely. Gently stretch out the tubing by separating the knees. Hold for the count of two and then bring the knees together. Repeat 5-10 times.

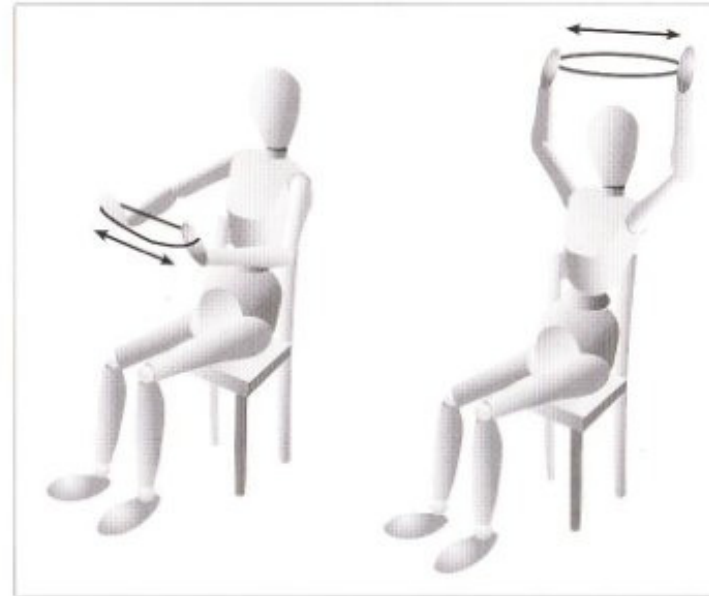
Exercise 35



Seated at the front of the chair, place the tubing around the feet. Straighten the legs. Make sure the tubing is firm beneath your feet. Place one hand on the hip, securing the tubing. With the other hand, palm upwards, pull the tubing back towards you keeping the elbow close to the body. Slowly return the hand to the thigh keeping your feet on the ground. Repeat 5-10 times with each arm.

Exercise 36

Double the tubing and put your arms out in front of you at chest height with the elbows slightly bent and stretch the tubing by pulling the hands apart. Hold for the count of two, then raise your hands above your head. Repeat at both levels 5-10 times.



Remember to cool-down

If you have worked your way through all the routines you will have improved your strength and may even have noticed a positive effect in your daily life and activities. You may decide to stick with the exercises detailed here, perhaps mixing exercises from different levels to add interest.

If you have enjoyed the exercises, but now

feel you need something even more challenging, you could try making the exercises a little more difficult. Listen to your body, and if the exercises *are* becoming easier, add some weight to work against. Tinned food, bags of sugar, or bean bags can all add weight, making exercises a little harder and increasing their effectiveness.

HAND, FINGERS AND WRISTS

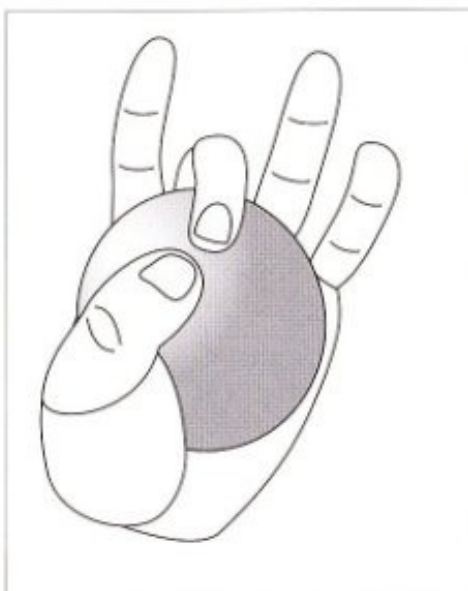
The hands and wrists are common areas for arthritis and stiffness. With just a little bit of work you can keep your wrists and fingers mobile and perhaps make them stronger.

Exercise 37



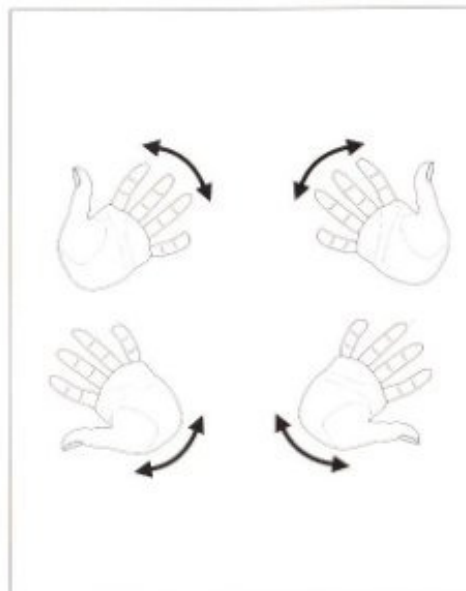
Seated in a chair with arm rests, place your forearms on the rests so that the wrists can hang down easily. Keeping the forearm touching the armrest at all times, bend the wrists back and hold for a count of 8. Repeat with both wrists 5-10 times.

Exercise 38



Seated, grip a ball (tennis or soft foam) in the palm of the hand. Press your index finger firmly to the thumb over the top of the ball, repeat with each finger (the little finger will be very hard) holding for the count of 2 each time. Repeat with other hand.

Exercise 39



Seated, rotate your wrists fully, then keeping your elbows close to your body, shake your hands out as if they had water on them, keeping the fingers splayed. Make sure that you fully stretch out the fingers and fully rotate the wrists.

PREVENTION OF FALLS

Falls are a major health problem and must be taken very seriously. Frequent fallers have poor outcomes and poor life expectancy. Fractures, mostly due to falls, cost the NHS £750 million a year. To help reduce your risk of falls you must work on a number of areas of your body, as well as taking a good look around your home.

First, in terms of your home, you should make sure that stairs and hallways are well lit, that there are no trailing wires or loose rugs that can be tripped over. Handrails and non-slip mats are useful in the bathroom. Try to avoid bifocals and use separate distance and reading glasses. Flat, non-slip soles (as long as they are not slippery) are safer than heels, sandals or thick trainers, because they allow you to 'feel' the floor under you.

If you suffer dizziness when you get up after lying or sitting for a while, then try to do some gentle exercises before getting up. This will get the blood moving and reduce the possibility of a sudden drop in your blood pressure (postural hypotension).

Strong muscles, faster muscles, which can react quickly, good co-ordination and balance will also reduce the risk of falls. Regaining sensation in your neck, ankles and feet will help maintain your body's ability to stay upright!

If you are already a faller, then it would be advisable to purchase hip protector pads (address at end of booklet) to wear during exercise. One research trial has shown that there were no hip fractures in those people who were wearing hip protector pads when they fell.

34 Prevention of falls

Muscle power

Muscle power is the product of strength and speed. It is very important as we use our muscle power to prevent a stumble from becoming a fall, and to move fast in a dangerous situation. Muscle power can be improved with strengthening work, but an element of movement (speed) is required in the training.

Muscle power alone is not enough to counteract the effects of frailty after an operation or prolonged illness. Exercise to improve balance and functional ability (such as being able to rise from the floor unaided) is also important to maintain independence. Activity specific training is necessary to improve our performance in particular tasks,

and to retrain the neural links to the brain for that movement.

In a recent trial¹, 20 women over the age of 74 with a varied and multiple illness history, participated in 8 weeks of training. They showed a 20% improvement in strength; 30-50% improvement in flexibility, nearly 50% improvement in balance and good improvements in functional ability, particularly in their ability to get up off the floor.

¹ Skelton D.A. & McLaughlin A.W. Training functional ability in old age. *Physiotherapy*. 82(3): 159-167, 1996.

Muscle power (continued)

Seated forward in your chair, place one foot inside Dynaband or Theraband tubing, or tights, lift the knee upwards and pull the tubing close to the body so that it is taut. Push the foot outwards to straighten the knee but keep the hands in place and the tubing as tight as possible. It should feel like a seated cycling movement against resistance. You should feel as if your hips, thighs, upper arms and back are working.

Other useful exercises are: Nos: 7, 12, 18, 22, 32 & 34.

Exercise 40



36 Prevention of falls

General balance

Exercises to improve balance are performed without holding on to forms of support (such as a chair) as much as in 'normal' exercise. If possible, work on these when somebody else is in the house, but if you live alone, take the exercises slowly and carefully.

Exercise 41



Standing with one hand on a solid chair backrest slowly walk on the spot making sure your free arm swings and that you lift your knees fairly high. Repeat for 2-3 minutes then **slowly** walk around the chair five times and sit down carefully. After a few weeks, if your balance has improved, try to do this without holding on to the chair.

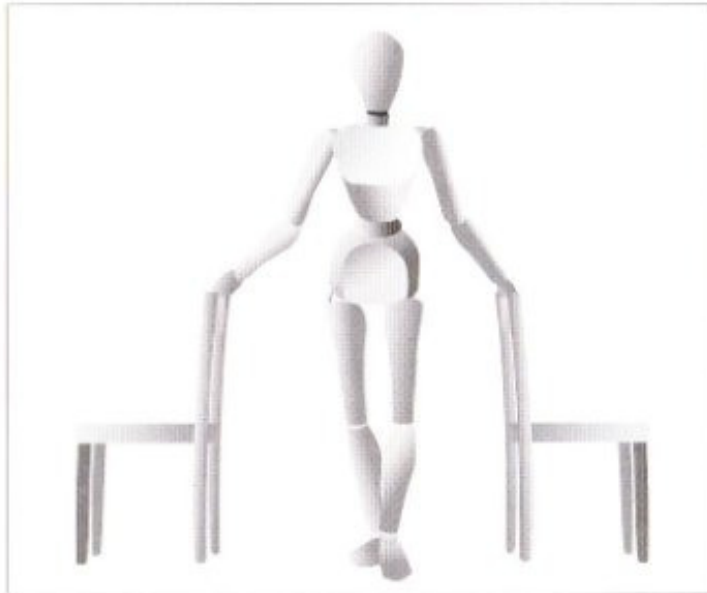
Exercise 42



Stand behind a chair and hold on with both hands. Raise your left foot off the floor for the count of ten. Go up on to the toes of your right foot slowly and then flatten the foot again. Repeat with the other leg. Gradually increase the holding time of the raised leg - when you feel more secure with this exercise try with just the fingertips of one hand on the chair and eventually no hands. Keep your hands close to the chair for safety.

General balance (continued)

Exercise 43



Standing, holding on to one or two chairs for support, take your weight on to one leg. With the other leg, touch the heel of your foot to the toes of your weight-bearing leg and then swing the leg around slowly and touch the toes against the heel. Once you have better balance, put the moving foot on to the floor and take your weight on to it, thus practising transfer of weight too. After 4 heel/toe touches, swap legs. Build up slowly to a maximum of 8 toe touches on each leg.

Exercise 44



Standing, holding on to a chair lightly, gently swing your leg forwards and back. Turn and change legs. Let go of the chair and **power walk** (see Exercise 20, page 21) briskly around the room.

38 Prevention of falls

Co-ordination and reaction

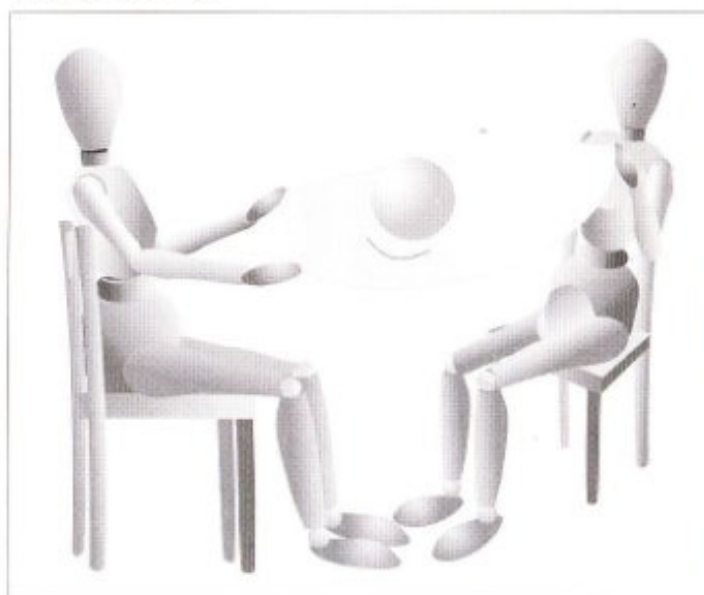
Co-ordination and reaction times deteriorate as we age but can be regained with practice. The following exercises promote quicker reactions and spatial awareness and therefore help in avoiding falls. Persuade a friend to work on these exercises with you. *Fitter folk do it in pairs!*

Exercise 45



Seated firmly back in your chair throw a small soft ball into the air and try to catch it in the same hand. If this is too difficult to start with, then use either hand, or both, to catch it. As you get better at catching, try to alternate the hands. Try clapping your hands together between letting go of the ball and catching it. In pairs, throw and catch the ball.

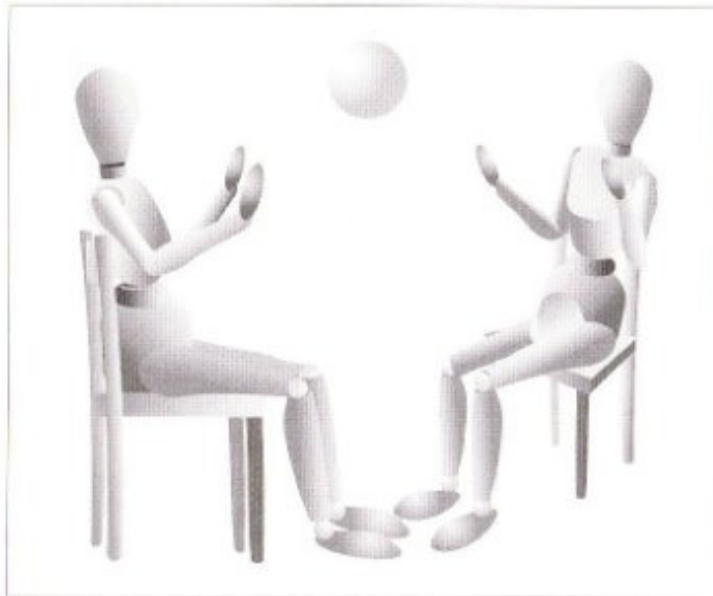
Exercise 46



Seated facing your partner, hold a medium size towel between you horizontally, with a balloon or soft ball lying on the towel. Hold each corner of the towel tightly. You and your partner can then guide the ball around the outer edge of the towel by moving the towel in small controlled movements. Try pulling the towel taut between you and making the ball jump up in the air. Catch it again in the towel.

Co-ordination and reaction (continued)

Exercise 47



Seated facing your partner, bounce a large soft ball on the floor across to your partner who should catch it and return it to you by the same method. Once you catch more than you miss, try sitting further back and throwing it to your partner gently without bouncing it on the floor. If you feel adventurous, try a seated game of football, where the legs of your chair are the goal.

Exercise 48



Seated facing your partner, take a baked bean tin in each hand and do a routine with the arms that your partner must copy. Avoid quick, uncontrolled movements; slow movements are far more effective. You should take the lead in the 'display' for a couple of minutes and then swap roles. Try to copy each other's movements exactly.

40 Prevention of falls

Tai Chi

Tai Chi is based on the ancient Chinese mind and body discipline and it is practised, en masse, by older Chinese people. It is a series of slow, controlled movements that require a great deal of concentration. Research has shown it to be a most effective exercise regimen to reduce the risk of falls in older people.

Ideally, it is best to join a class for expert instruction, particularly as some of the movements may seem complicated at first. Your local council will have a list of Tai Chi or related classes in your area, or a video can be followed at home. At first it is best to have someone else in the house while you do these movements. Wear loose clothing, preferably trousers or either no shoes or flat, plimsol-like shoes. Ensure you have room to move.

A. Standing, with good posture (*see* page 10), make sure your feet are hip-width apart, your knees are soft rather than

rigid and your hands are either side of your thighs, palms facing backwards. Raise your arms slowly to shoulder level. Think of your arms as raising up rather than you raising them. Inhale as you lift the arms and imagine you are resting your hands on a large beach ball. Keep your hands relaxed and your fingers slightly spread. There should be no sharp angles at the shoulders, elbows or wrists. Only hold this position until you start to tense, then relax and lower your arms to the start position.

- B. Then relax your hands and arms so that you are holding the imaginary beach ball at stomach rather than chest level.
- C. Turn your palms towards the floor, still at stomach level, exhale as you relax the knees and sink slightly, then inhale as you rise again.
- D. Place your right foot slightly forward of your left and inhale slowly. As you exhale

Tai Chi (continued)

slowly, raise the arms (as if floating) to chest level and imagine you had a smaller beach ball between the hands so that your right palm is facing you and your left palm is facing away.

- E. Turn slowly to your right and as you do, turn your right palm away from you (drop the imaginary ball) and turn your left palm towards you. Check that you have 'soft' knees and that your posture is still correct. Turn your torso back to the front.

- F. Turn the body to the left and, at the same time, raise the left arm behind you as high as possible towards the shoulders.

This gives you just a flavour of Tai Chi. Always remember that no part of the body should be tense or over-stretched and all movements should be slow and controlled, and the breathing regular.

Neck

Tipping the head back or turning the head suddenly can cause dizziness. Therefore do not tip the head backwards such as when you are straining to reach something on a top shelf nor turn suddenly during the following exercise or, for that matter, in your daily life.

Exercise 49

Seated securely in the chair, bring the chin down on to the chest slowly, then raise it to normal position. Drop the right ear towards

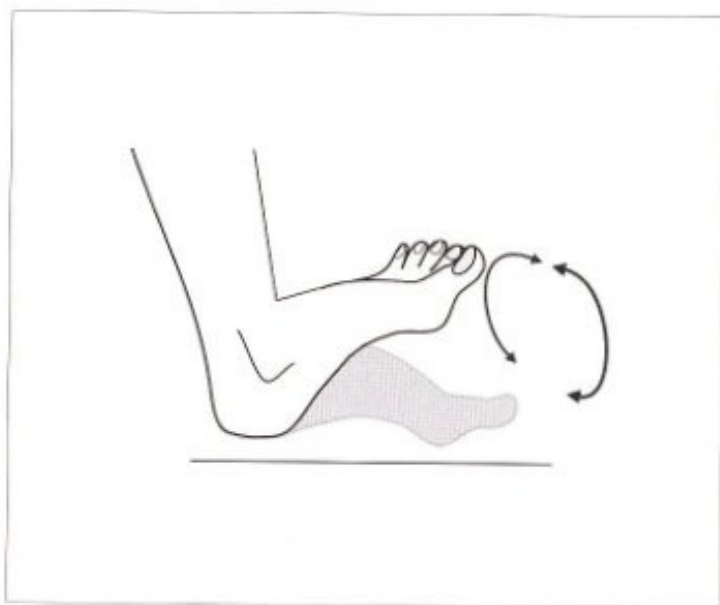
the right shoulder slowly then return to centre. Drop to the left ear. Make sure that you do not raise the shoulder to meet the ear. Turn the head round so that you are looking over the right shoulder and slowly return to centre; turn the head to look over the left shoulder and return to centre. Repeat whole sequence for about five minutes, *but remember to do the exercise slowly.*

42 Prevention of falls

Feet and ankles

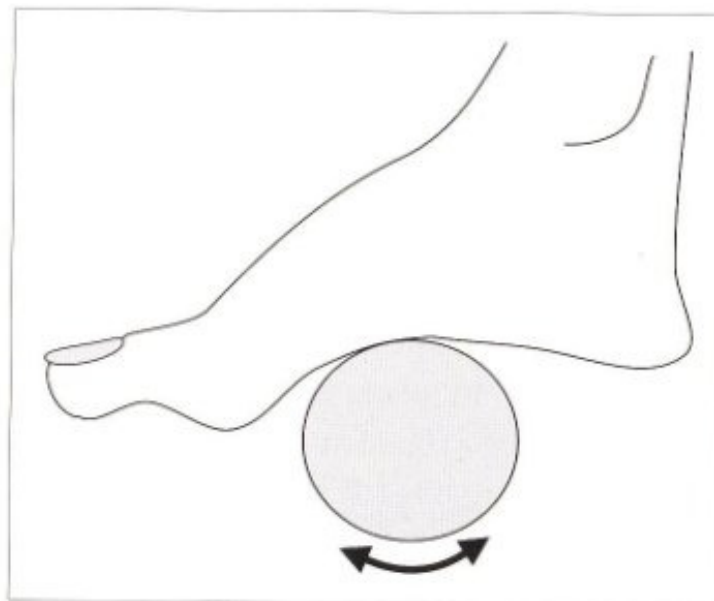
Exercising calf muscles, ankles and feet will reduce swelling and help retain or regain mobility. Retaining sensation in the soles of the feet is important for good balance.

Exercise 50



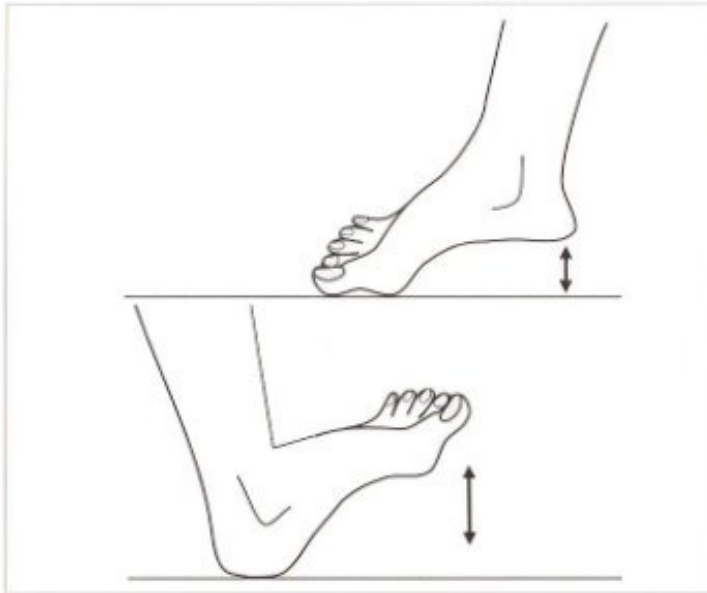
Sitting comfortably with your shoes off and feet off the floor, rotate your feet at the ankle joints several times in one direction and then in the opposite direction. Imagine you have a pencil between your toes and try to draw a perfect circle both ways.

Exercise 51



Seated at the front of your chair, place a baked bean tin or a smaller ball under the bottom of the foot (with your shoes removed). Roll the tin or ball forward and back along the sole of the foot. Feel your toes and foot arch gripping the object. Splay the toes out being careful not to bring on cramp, then try gripping the carpet with your toes.

Exercise 52



Seated at the front of your chair with your toes on the floor, bring your heels up off the floor, pushing down into the carpet with the ball of your foot at the same time. Feel the muscle in your calf working. Then, drop your heels and pull the toes up towards the shins, keep the pressure firmly through your heels into the floor. Feel the muscle working in the front of the shin.

Exercise 53



Seated, put your feet about 6-8 inches apart on the floor and place your knees together. Keeping the knees together, turn your toes in to touch each other and push down through the outside edge of the foot to the floor, as if you were going to touch your ankle bones on the floor. Straighten feet again and, keeping the inside edge of the foot and big toe firmly on the floor, try to turn the ankle inwards as if you were attempting to touch your inside ankle bones together.

44 Prevention of falls

Bone density - reducing the risk of fracture

Bone density is lost from the age of 30 in both men and women, but women are twice as likely to sustain an osteoporotic fracture as men. Bone loss in women is particularly fast during the menopause.

Bone mass is affected by mechanical factors and when bone is stressed regularly during weight-bearing exercise, for example, it responds by increasing mineral density. When bone is not stressed regularly, it loses density. Research has shown that the rate of bone loss can be slowed and, to a very limited extent, increased through regular, tailored exercise.

Anyone with advanced osteoporosis will need advice from their GP as to the safety of some exercises. There has to be a balance of the amount of strength training/weight bearing exercise in relation to the risk of falling during the exercise and possible fracture. The wearing of hip protector pads can also help. There are certain abdominal exercises such as situps, that, if badly performed, can cause thoracic/cervical

fracture in people with low bone density.

For someone with low bone density but not diagnosed osteoporotic, the exercise must be specific to the purpose. Swimming, chair-based exercise and yoga for example will not be effective at reducing bone loss, because the body's weight is being supported.

Strengthening work (using elastic tubing, or adding weight by using tins or bags of rice), fairly brisk (preferably uphill) walking, using stairs (instead of lifts or escalators) and wearing leg weights during the day will all help in maintaining bone density. Squeezing a tennis ball slowly but frequently is a great bone booster for the wrists.

Unlike strength, flexibility or balance training, you will be unaware of the difference exercising regularly is making to your bones.

Remember, however, osteoporosis is a silent disease and exercise is vital in order to reduce the risk of fracture after a fall, and to retain mobility and independence.

Getting down on to the floor - reducing the fear of falling

You may not have been down on to the floor for quite some time, but it is important that you practice this safe technique for getting down and rising again.

Exercise 54



Face your chair, keeping a straight back as you bend the knees slightly, clasp both sides of the chair seat with both hands. Bend one knee and start lowering yourself to the floor on the other. (Use a cushion if your knees are sore.) Once both knees are on the floor, support yourself by using your arms. Keep the chair close to you. Place the hands on the floor using your arms to support you so the hips and buttocks are

lowered to the the direction you wish to sit so that the hips reach the floor without a bump. Extend the leg closest to the floor out slightly and place the other leg beside it. To get up, push up with your arms so you are lying resting on one elbow, bring your knees closer to the body and move into a kneeling position with your arms supporting your body weight. Use a chair to rise from kneeling (*see also* p.27).

MAINTAINING CONTINENCE

Pelvic floor exercises

Exercise 55

To help reduce the likelihood of urine leakage or other forms of incontinence, good strong pelvic floor muscles are necessary. These exercises are useful for men or women, can be done anywhere, any time and are not obvious when they are being done. Ideally do the exercise whilst lying on your side on the floor, with your knees bent, so that you practice getting up and down from the floor too, but they can be done seated in a chair, or standing.

Tighten up your back passage, and then also your waterworks. With both areas tightened imagine using your internal

muscles to pull your front passage up towards your head. The feeling should be similar to stopping yourself from urinating. Hold for the count of six then let go slowly. Then repeat the whole sequence as quickly as possible, hold the last stage for one second and then release.

Try to repeat this full sequence at least six times a day, taking care not to hold your breath. No-one need know you are doing these exercises.

Fuller exercises are available from the Continence Foundation (address at the end of the booklet).

EXERCISE AND SPECIFIC CONDITIONS

Reducing excess weight can be beneficial
in the treatment of all these conditions

Arthritis

There are two major types of arthritis, osteoarthritis and rheumatoid arthritis. Both respond to exercise, but differently.

Osteoarthritis is the most common form of arthritis and is often thought of as the wearing out of a joint. Exercise should be aimed at increasing flexibility of the joint affected and strengthening of the muscles surrounding that joint. Non weight-bearing exercise is ideal, such as swimming and chair-based exercise.

Rheumatoid arthritis tends to be more progressive and is painful most of the time with occasional 'flare-ups' which may be disabling. In the acute phase, or during one of these 'flare-ups' people may need hospitalisation, but certainly rest is necessary. After the acute phase is passed then posture work and gentle mobility and stretching exercises can be used to correctly align joints and increase range of movement. Once flexibility has returned, strengthening

work should be done to stop weakness occurring following immobility.

Diabetes

There are two basic types of diabetes, insulin dependent and non-insulin dependent (or diet controlled). It is the non-insulin dependent diabetes that generally affects older people. If there are vascular complications then it is suggested that exercise is similar to a cardiac rehabilitation plan and should be supervised. However, flexibility and strengthening exercises and eventually some aerobic work to promote better circulation all have their part to play. Walking, swimming and cycling are good. You should aim to exercise a minimum of five times a week. It is important to exercise with a supply of glucose or a sugary drink nearby in case you feel dizzy, indicating that your blood sugar has dropped too low. It is always more prudent to exercise with somebody nearby.

48 Exercise and specific conditions

Parkinson's disease

Parkinson's disease is caused by a malfunction of part of the brain controlling voluntary movement. Muscles become rigid and movement is slow and stiff. Rigidity of the muscles interferes with circulation which can result in pain and fatigue. Ideally you should attend a specialised exercise class adapted for people with Parkinson's as specific stretching and mobility movements are often necessary. But classes once or twice a week must be supplemented by some daily exercise at home, concentrating on breathing, relaxation, and improving the flexibility of the muscles that have become stiff or taut. 'Opposing' muscles must be strengthened so that the joints can be straightened.

Tips for those with hip replacements

- Don't sit on too low a chair
- Avoid bending your hip more than 90° (right angle)

- Don't cross your legs
- Don't lie on your side without a pillow between your legs
- Don't twist the foot of the operated hip outwards too far
- Avoid cutting your own toenails or bending down to the floor

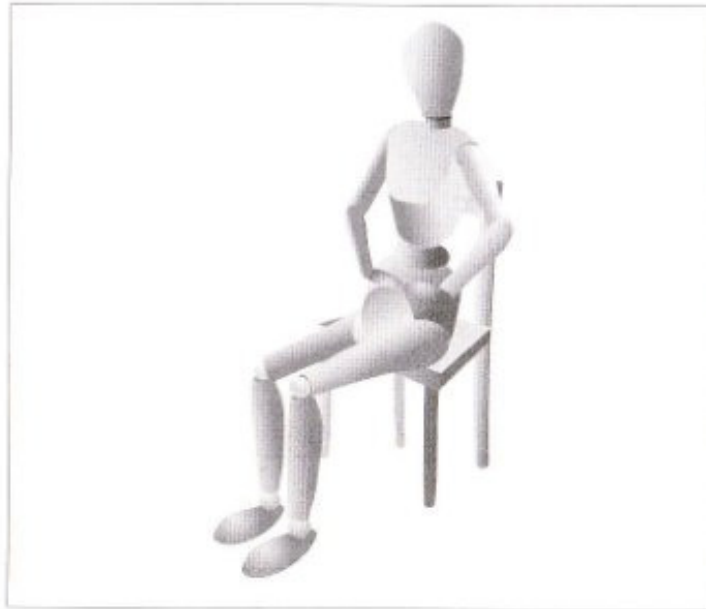
Exercising with a stroke

Following a stroke there is often a loss of movement and sensation on one side. Balance, speech and swallowing problems, incontinence and depression are also common. The main stages of recovery will occur in the first six months, but further improvements can be seen over the next 18 months with rehabilitation. An arm or shoulder that has lost sensation and strength is prone to dislocation, so while exercising always support the arm with either the other arm or a pillow. It is best to work on the mobility of the affected arm first and get advice from a stroke clinic or physiotherapist.

DEEP BREATHING AND RELAXATION

Many older people have decreased lung elasticity and a less flexible chest wall. Breathing is often shallow and only the upper chest cavity fills with air. Abdominal breathing helps increase oxygen supply to the lungs.

Exercise 56



Sitting upright in the chair, place your hands on your stomach, finger tips either side of the navel. Inhale slowly through the nose for a count of three. Make sure your stomach fills and pushes out your navel. Exhale slowly through your mouth for a count of

four, perhaps making a forceful blowing noise while you exhale. Tighten abdominal muscles at the end of the breath out, take three normal breaths and then start again. Repeat ten times; be careful not to hyperventilate (overbreathe).

50 Relaxation

Seated, relaxed in a chair with armrests, close your eyes. Take a deep breath and slowly let it out. Tighten and stretch out your whole body starting with your toes. First scrunch up the toes, stop and then stretch them out as far as you can. Tighten your leg muscles, stop and then release them. Tighten and relax your stomach muscles, and your pelvic floor muscles. Clench your hands into fists, relax, then stretch your fingers out as far as you can.

Make your neck taught and scrunch up your face. Stop and let these muscles sag.

Tense and relax these muscles very slowly so that you end with the whole body and head feeling heavy. Repeat the sequence again and then try some deep breathing. Conjure up a pleasurable memory, a holiday for example. Imagining lying on a sunny beach with warm, shallow water gently washing over you, taking away your tension, can also be effective.



MOTIVATION

Everyone's motivation for starting and continuing exercise is different. Some join classes to socialise, others because it makes them feel good. Whatever your motivation, it will lapse from time to time. It may help to find a friend to exercise with and set aside times in the week when you will exercise together and stick to a plan. Setting and working towards short-term goals, and achieving improvement is also an excellent motivator.

Whatever your reason, just remember that a garden gate that does not swing gets rusty

at the hinges!

Finally, it is true to say that almost any exercise routine can become boring. When this happens, exercise can lose its appeal and it is time for a change. If this happens to you, change your exercise, scene or pace.

Adding resistance to your exercise can be very effective. You may like to use Therabands or Dynabands.

Contact details of organisations you may like to talk to and for materials can be found on page 54.

TIPS FOR A FITTER LIFE

- Rather than having a shower have a sit down wash using a **flannel** - reach down to your shoulder blades, reach up into the base of your back, reach behind your buttocks and the back of your neck. This will help increase your flexibility.
- When drying yourself after a wash put the **towel** behind your back with one end in each arm and try doing a back rub with the towel as if you were doing the 'twist'.
- Try putting your **clothes** on standing - but leaning on a wall or near a chair for support. This will help improve your balance.
- Squeeze your own juice for breakfast, with a hand **juicer**, to improve your finger and hand strength.
- Bake a **cake** or bread, kneading and mixing are good exercises for the hands and arms.
- If you have a **coffee mill** or **pepper mill**, spend time using that rather than buying instant coffee or ground pepper and at the same time you will strengthen your hands so you can open jars more easily.
- Scrub the floor with a **scrubbing brush**. This uses arm muscles, gives the back a good stretch and is good practice for getting down and up from the floor.
- Use the **stairs** rather than escalators and lifts wherever possible. Stairs are an excellent form of strengthening exercise for the legs and ankles.

TIPS FOR A FITTER LIFE

- Make use of a **walking stick** by sitting on a chair and doing large circular movements with the stick to promote flexibility and strength in the upper limbs.
- **Marbles** provide fun for children and adults. Try flicking marbles with your fingers for strength; rolling them under your feet and toes provides a good exercise for the feet.
- Try rolling a **golf ball** between the palms or under the feet, or around behind your neck without dropping it.
- Doing exercises in **bed** before you get up is good. Not only are you already warm but such exercise will reduce the chance of dizziness.
- **Cycle inner tubes, stockings or tights** can be useful instead of a piece of elastic tubing to add resistance to an exercise.
- Fill some **socks** with **dried lentils** or use tins of food or bags of rice as weights.
- **Cushions** can be used to roll up into the base of the back and push against during floor exercises.
- Use your old hand **whisk** instead of a blender or electric whisk.
- Using a **hoover** (swopping arms) or a **lawn mower** are great exercises if a bit more effort is put into the chore.
- Grab hold of your grandchildren's **football** or **tennis ball** for some co-ordination work, or for that matter, buy your own!

CONTACT AND MATERIALS LIST

Your local leisure centre Most have a range of classes suitable for all levels of fitness

Your local council will have a list of exercise activities for over-50s in your area

Your local gym Specialised gym equipment is calibrated to suit all fitness and ability levels.

Arthritis Care 48 Stephenson Way, London NW1 2HD Tel: 0171-916 1500

British Diabetic Association
10 Queen Anne Street, London W1M 0BD
Tel: 0171-323 1531 Care line 0171- 636 6112

British Veterans Athletics Federation
c/o Bridget Cushen, Honorary Secretary,
156 Mitcham Road, Croydon, Surrey
CRO 3JE Tel: 0181-683 2602

Central YMCA (Training & Development)
112 Great Russell Street, London WC1E
3NQ Tel: 0171-580 2989

Continence Foundation 307 Hatton Square,
16 Baldwins Gardens, London EC1N 7RJ
Tel: 0171-831 9831

Extend 22, Maltings Drive,
Wheathampstead, Herts AL4 8QJ
Tel: 01582-832750

Health Education Authority Trevelyan
House 30 Great Peter St., London SW1P
2HW Tel: 0171-222 5300

Help the Aged Unit 7, Kirkstall Industrial
Park, Leeds LS4 2A2 Tel: 0113-279 6000

Ramblers' Association 1/5 Wandsworth
Road, London SW8 2XX. Tel: 0171-582 6878

**The London School of Tai Chi Chuan and
Traditional Health Resources** PO Box 9836,
London SE3 0ZG (6 x 9 inch SAE please).

National Backpain Association The Old
Office Block, Elstree Road, Teddington,
Middx TW11 8JT Tel: 0181-977 5474

National Osteoporosis Society PO Box 10,
Radstock, Bath BA3 3YB Tel: 01761-471771

Parkinsons Disease Society 215 Vauxhall
Bridge Road London SW1V 1EJ
Tel: 0171-931 8080

The Stroke Association Stroke House,
Whitecross Street, London EC1Y 8JJ
Tel: 0171-490 7999

CONTACT AND MATERIALS LIST

The Swimming Dragon Tai Chi video
Mayfair Publishing, PO Box 860
Eastbourne, Sussex BN20 7DG (£13.99 +
£1.75 p&p)

The Tai Chi Manual A step by step guide to
the short yang form by Robert Parry,
published by Piatkus Books, London,
5 Windmill Street WP1 1HF 1997
ISBN 017499 1699-0

Exercise for Life booklet, The British Heart
Foundation, 14 Fitzhardinge Street, London
W7H 4DH Tel: 0171 935 0185

Fitness for Life Sharp C, Dinan S, published
by Piatkus Books, London, 5 Windmill Street
WP1 1HF 1997 ISBN 0-7499 1577-3

More Active More Often 35 minute video of
chair-based exercise to music. Research into
Ageing, 15-17 St Cross Street London
EC1N 8UN. Tel: 0171 404 6878. Credit
cards welcome. Suggested donation of
£10.00 inc p&p.

Gently Does It video from Extend,
22 Maltings Drive, Wheathampstead, Herts,
AL4 89J Tel: 01582 832760 £13 inc p&p
Hip Protector Pads Robinson Healthcare,
Waterside, Walton, Chesterfield S40 1YF
Tel: 01246-220022. Contact your local GP or
physiotherapist to find your nearest stockist.
Dynaband Elastic tubing (smaller quantities)
- most sports shops, available in a range of
resistances.

Therabands in bulk from Ways & Means,
17 Ludlow Hill Road, Melton Road, West
Bridgeford, Nottingham NG2 6HZ.
Tel: 0115 9360319

58 Record of achievement

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| <input type="checkbox"/> Urinary Incontinence | <input type="checkbox"/> Nutrition |
| <input type="checkbox"/> Osteoporosis | <input type="checkbox"/> Pressure Sores |
| <input type="checkbox"/> Exercise | <input type="checkbox"/> Ageing Process |
| <input type="checkbox"/> Impaired Vision | <input type="checkbox"/> Falls |
| <input type="checkbox"/> Leg Ulcers | <input type="checkbox"/> Depression |

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- ☐ Research into Ageing's work
☐ How to make a will
☐ How to make my gift tax-effective

Please send me details of how I can
help

- ☐ as a volunteer
☐ by supporting local fundraising activities

YES, I want to help Research into Ageing
achieve a healthy old age for all and
enclose my donation:

£100 ☐ £50 ☐ £25 ☐ £10 ☐ other £.....

Please send me..... copy/copies of 'Exercise
for Healthy Ageing' at the suggested donation
of £5 per copy. £.....

Total payable £.....

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Access/Visa/CAF Charity Card

Account no:

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Expiry date...../...../..... Today's date...../...../.....

Signature.....

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Please return this form to:

Research into Ageing, 15/17 St Cross St. London EC1N 8UW

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REGULAR EXERCISE

Helps prevent:

- Osteoporosis
- Impaired glucose tolerance
- Hypertension
- Ischaemic heart disease
- Stroke
- Anxiety
- Depression

Helps reduce the incidence of:

- Angina pectoris
- Heart failure
- Asthma
- Chronic airflow obstruction
- Multiple disability

Helps prevent the complications of immobility, such as:

- Faecal impaction (constipation)
- Deep vein thrombosis
- Gravitational oedema (ankle swelling)
- Contractions
- Pressure sores

Helps prevent isolation through:

- Socialisation
- Personal contact
- Improved morale

From: Young, A, Dinan, S. Fitness for Older People BMJ 309, pp.331-4, 1994.

EFFECTIVE EXERCISE THE NATURAL WAY

- N**atural breathing - don't hold your breath
- A**lignment - maintain good posture
- T**ire the muscles for effective strengthening
- U**ncomplicated movements are best for all-round safety
- R**igid wrists during arm or hand exercises promote good grip strength
- A**llow time, do the exercises slowly and purposefully
- L**ie on the floor to maintain your confidence in getting up and down

EXERCISE FOR HEALTHY AGEING

A planned programme of exercises specifically devised to help older people increase mobility, balance, strength and power



Baird House, 15-17 St Cross Street
London EC1N 8UN tel 0171 404 6878

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