

## Agenda and Objectives

1. Introduction and sharing concerns/expectations
2. Summary and aims of the program
3. Your views: Using the shopping list
4. Balance and strength exercises

### **BREAK**

Balance and strength exercises (continued)

5. Risk appraisal
6. Homework

### **The main objectives of this session are:**

1. To meet each other and learn about the program.
2. To understand that we all have falls and there many reasons why we may fall.
3. To recognize the importance of balance and strength exercises for preventing falls.
4. To share our knowledge, ideas, questions, and answers with each other and with the group leader; learn about the group process.





**BRAINSTORM** • *What topics would you like to see covered in this class?*

**Say/Paraphrase:** *First, we are going to learn the brainstorm technique to allow us to share ideas quickly. The four main principles of brainstorming are:*

- *Anyone can and should share their ideas*
- *Everyone should be listened to without comment*
- *Save questions and discussions on ideas until the end*
- *Give clarifications, if needed, at the end*

**Say/Paraphrase:** *Now we are going to brainstorm: What topics would you like to see covered in this class?*

After the brainstorm, hand out pens and the shopping list. Ask each person to check the topics of interest and add others. They should turn the list back in to you. Explain that the leaders will tally the list and let the group know in the next session which ones are the most popular issues. The leaders will incorporate this list into the program.

As you plan the sessions, consider how to use the list. For example, it might influence which slides you will stress or questions you will cover when looking at home safety or the kinds of mobility “mastery experiences” used in Session 6, “Getting Out and About.” It might also influence the topics you schedule for Session 7.

## 1.4 Balance and strength exercises (35 min)



### **Notes for the Leader:**

Introduce the guest physical therapist and let participants know what sessions the therapist will attend so they can be prepared to bring any questions they may have.

**Say/Paraphrase:** *We have our physical therapist with us today to introduce the exercises, review them, then teach the Moving about Safely and Getting up from a Fall segments at the next session, and return for exercise questions and tips on advancing exercise in Session 6.*



## Session 1



### **HANDOUT** • Exercise Manual

Along with the therapist, the leader reviews how the manual is laid out and how the participants will use it. Cover the following points:

- Introduction and how often each exercise is done
- Balance section
- Strength section
- What to do when the exercises become too easy
- Encourage participants to take notes on the pictured pages
- Instruct participants to bring the manual each week
- Explain that the **Notes** pages at the end of the manual are for jotting things down
- Explain that participants will get an Exercise Log each session and should bring it back the following session



**Use the Leader/PT Exercise Guide** (located just after the Background Information section) while the participants use their Exercise Manuals.

The leader facilitates this section with the physical therapist to make sure the following points are covered:

- How each exercise prevents falls and improves function, using real-life examples.
- That balance and strength can be improved at any age.
- As the physical therapist moves around and works with participants, the leader assists those who need help. The peer leader also moves around and alerts the leader or PT of any safety concerns.
- Don't forget that this is a good chance to observe how your participants exercise and determine whether you want to plan for extra helpers for classes.
- There will be a break after the first exercise — sit-to-stand. Have people get up and move around during the break.
- Encourage questions and encourage participants to take advantage of having the therapist at the session. Guide the therapist to people who have questions.
- No participants should have pain from doing exercises. If they do, the exercise needs to be modified.



- Make sure participants understand how to self-monitor when they do the exercises at home.
- Make sure everyone tries the ankle weights. They should know how to put them on, take them off, and add weight.

### **Safety tips for exercises in class and at home:**

**Important:** All participants should determine before the program that they're medically fit for these exercises and are doing so with the approval of their physician. They should notify leaders of any special needs or considerations beforehand. Leaders are not responsible for determining medical suitability for participating in this program.

- Have participants hold on to solid surfaces for balance; example — table tops, counters, or a rail mounted on the wall.
- If someone uses a cane or walker, he or she should start holding on with both hands.
- Clear away obstacles from the exercise area; example — purses or papers on the floor. Push chairs away from the tables.

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### **Notes for the Physical Therapist:**

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Essential reading and review before the session include the Session 1 exercise Background Information section, which gives suggestions for each exercise; the Exercise Manual; and the research articles.

### **The physical therapist should make the following points:**

- **Use the Leader/PT Exercise Guide** (following the Background Information section) while the participants use their Exercise Manuals. The guide is written so a leader with minimal exercise experience will also be able to use it.
- Introduce the exercises briefly and explain their importance in preventing falls through improving balance and strength.
- Explain that participants can improve their balance and strength.

**Say/Paraphrase:** *Unlike our elite athletes who have to train extremely hard to get any further gain, you will be able to feel your legs growing stronger and your balance getting better within a couple of weeks.*

- Explain that there are balance exercises that can be done daily and strength exercises that can be done 3 times a week. If they practice, participants will see a difference quite quickly — their legs will strengthen and their balance will improve.



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- Explain that muscles get stronger by challenging them and making them work harder. Balance improves by challenging it.

**Say/Paraphrase:** *We will show you how to improve your balance by challenging it in some simple ways.*

- Combine a practical demonstration of each exercise with clear and simple explanations (see key concepts below), as the participants practice each one. To reinforce learning, the participants can look at the exercise in the manual before they practice it. They can write down any tips and should fill in the number of repetitions suggested by the therapist. They should review the manual again after practicing the exercises.

### **Balance exercises (preferably daily):**

- Start with the sit-to-stand exercise. Note each participant's ability to stand, his or her standing balance, use of assistive device, and ability to sit down. Demonstrate the exercise, explain how it links to function and preventing falls, have participants practice it, make any modifications, and correct their technique as needed. Refer participants to the instructions in the Exercise Manual and make sure everyone understands them.



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**Leader announces the 15-minute break.** Put out beverages and snacks. Leader works with the therapist to encourage participants to move around. Remind the physical therapist to observe how the participants move around and note which participants need more assistance. The therapist will also be available for questions during the break. Encourage participants to look at the display table.

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### **After the break, continue with the exercises.**

- Follow the same format as for the sit-to-stand exercise.
- For each exercise, make the link to how it can improve function and prevent falls, demonstrate, have participants practice, review the Exercise Manual instructions, correct participants' techniques, and make modifications as needed.



**Balance exercises (daily):**

- Sit-to-stand
- Sideways walking
- Heel-toe (tandem) standing
- Heel-toe (tandem) walking

**Strength exercises (3 days a week):**

- Side-hip-strengthening exercises
- Knee-strengthening exercises
- Heel raises
- Toe raises

For the side-hip- and knee-strengthening exercises, have participants put on the ankle-weight band without the weights, so they can see what the band feels like. Tell them that they will begin to use the weights the following week and will be given weights to take home.

It is helpful to give more information and answer questions while participants are practicing the exercises. Encourage questions at all times — this gives participants a sense of ownership of the information.

- Attend to the quieter participants first.
- Modify or advance the exercises for individuals as required. See Leader/PT Exercise Guide, just after the Background Information section of this session, for detailed suggestions.



# Session 1



## Key Concepts to Use as Participants Are Doing the Exercises

<p>Talk about the benefits of the exercises. Avoid jargon and use physical demonstrations to keep the explanations simple and clear. Link how each exercise prevents falls and improves function.</p>	<ul style="list-style-type: none"> <li>• For example, “The thigh muscles, the big muscle here,” makes it clear where the muscle is.</li> <li>• A demonstration can show what the muscle does. For example, show the thigh muscles engaging to prevent a trip.</li> </ul>
<p>Explain the benefits simply, reminding people, “This one is for balance and this one is to make your legs stronger.”</p>	<ul style="list-style-type: none"> <li>• The connection between doing the exercises and their actual value begins at this point.</li> <li>• Give a clear explanation with a visual demonstration of how the balance and strength exercises specifically relate to preventing a fall and improvement in everyday functional situations.</li> <li>• Give examples, such as regaining control from a trip or a loss of balance, walking more confidently, avoiding shuffling by heel-toe walking, getting up from a chair, and reaching into a cupboard.</li> </ul>
<p>Explain that it is important to report a painful back or knees, for example, so that the exercises can be adapted.</p>	<ul style="list-style-type: none"> <li>• Exercises can and should be adapted for individuals.</li> <li>• It is important not to overdo. The concept of “no pain-no gain” is not true.</li> <li>• Here is what it is okay to feel: achiness or soreness in the muscles for a couple of hours. People may feel stiffness in the muscles after exercise, and even into the next day.</li> <li>• Here is what it is <i>not</i> okay to feel: muscle pain the next day — this could mean the exercise may be too intense. There should be no pain or soreness in the joints at all.</li> <li>• Here is how to modify the exercise: The person should talk to the therapist at the first and second sessions. The therapist will modify the exercises.</li> </ul>
<p>Explain that there are balance exercises they will learn.</p>	<ul style="list-style-type: none"> <li>• For balance exercises, many people need to start with holding on, and that’s okay.</li> <li>• If someone uses a cane or walker, he or she should start holding on with both hands. Gradually, people will hold on less and less. This may take several sessions.</li> </ul>



## Key Concepts to Use as Participants Are Doing the Exercises (cont.)

<p>Explain that there are balance exercises they will learn. (cont.)</p>	<ul style="list-style-type: none"> <li>• They can start challenging their balance safely (for example, by having finger tips lightly touch the table or chair) once it's starting to get too easy. Participants should not advance until they feel it is getting too easy at their current level.</li> <li>• Observe that they have good lower body strategies to recover balance before they do the exercises without holding on.</li> <li>• Correct technique and good posture are important. For example, they should look ahead and not at their feet.</li> </ul>
<p>Explain key concepts about the strength exercises.</p>	<ul style="list-style-type: none"> <li>• For strength exercises, start out with a low number of repetitions and increase so they feel they're working a little bit but that it's not too easy.</li> <li>• It's important for them to have the correct technique at this stage so they target the muscles they are trying to strengthen.</li> <li>• Hold for a count of 5 in week one and do each exercise 5 times. This provides a reasonable starting place.</li> <li>• Make sure that the muscles are relaxed in between repetitions each time.</li> <li>• The standing strength exercises start out with holding on with one hand, unless the person uses a cane or walker.</li> </ul>
<p>Explain that participants can monitor the way they do the exercises at home to make sure they are of good quality, don't cause pain, and don't tire them out too much.</p>	<ul style="list-style-type: none"> <li>• The main idea is that the exercises should feel fairly comfortable, even with the last repetition of the set.</li> <li>• Participants should not be straining or in pain.</li> <li>• They should pay attention to how they line themselves up and use hand support so they feel stable and not in danger of falling down.</li> <li>• They should not get so tired after the exercises that they have to rest a long time or are unable to do their regular activities that day.</li> <li>• If they are ill or have other significant changes in their life, they may need to modify the exercises and build back up slowly. Remind them that it is okay to miss a day, but they should try to get back into their exercise routine as soon as possible.</li> </ul>
<p>Explain that the exercises can be advanced in different ways.</p>	<ul style="list-style-type: none"> <li>• The leader can be flexible about what to discuss regarding advancing in Sessions 1 and 2. For example, the group may include many frail participants. Of course, the leader or PT always should answer participants' questions about advancing.</li> <li>• Strength exercises are advanced first by increasing repetitions and then weights.</li> </ul>



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Key Concepts to Use as Participants Are Doing the Exercises (cont.)	
Explain that the exercises can be advanced in different ways. (cont.)	<ul style="list-style-type: none"> <li>• Balance exercises are advanced by going to finger-tip touching, then to no hands, or doing more challenging maneuvers.</li> <li>• Assure participants that they can exercise at a pace and level that suits them individually and should advance only when it starts to feel too easy.</li> </ul>
Give permission to “snack” on exercises if that is helpful.	<ul style="list-style-type: none"> <li>• For example, some people will do a few exercises first thing in the morning and the rest while watching TV later in the day.</li> <li>• Clarify that they need to complete one exercise fully at one sitting: for example, all repetitions for the left leg in one exercise and then all repetitions for the right leg in the same exercise.</li> <li>• Explain that, to be really beneficial, strength exercises need to be done at least 3 times a week, and balance exercises daily. When done at a regular time, they will become routine.</li> <li>• Ask participants to fill out the Exercise Log weekly; this helps to reinforce the exercise routine.</li> </ul>
Mention that walking is also good and encourage people to walk on a regular basis.	<ul style="list-style-type: none"> <li>• Research has shown, however, that walking alone will not prevent falling.</li> <li>• Emphasize that the balance exercises are the most effective in preventing falls — walking should not be a substitute for doing the balance exercises.</li> <li>• In fact, people need to be stronger and improve their balance to walk better.</li> </ul>

### Example:

Don't tell people you expect them to get up to a certain level for their ankle weights or that they have to do the exercises for life. They need to work this out on their own. Always answer any questions, however. Most important, respond very positively whenever participants realize that the exercises actually link to preventing falls and that they need to do them regularly. Take every opportunity to ensure that they share this realization with the whole group.

**Thank the guest speaker** for sharing his or her expertise during this section of the class; remind participants that they will see the physical therapist again the following week.



## BACKGROUND INFORMATION



### Exercises to Improve Strength and Balance

#### The aims are to:

- Motivate participants
- Understand the reasons why improving strength and balance can prevent falls
- Understand how these particular exercises can help participants so they can more safely do the things they like to do
- Practice and learn the exercises by breaking them down into simple steps
- Over the 7 weeks, advance the exercises based on individuals' personal potential
- Develop regular lifelong exercise habits

#### Motivating and explaining why

Older people in particular have a great capacity to increase muscle strength, and this fact can motivate them. It does not take long to increase strength. They will see a difference in one or two weeks and continue to improve over the 7 weeks of the program and beyond, if they do the exercises faithfully.

Balance is a complex skill that involves many muscles and is controlled by a particular part of the brain. Improving balance takes longer than improving strength, but it can be achieved. Balance exercises work for people of any age. Suggest that participants give the brain a chance to learn how to use these muscles again. "If your muscles used to balance better, then they can improve with practice." The term "use it or lose it" applies here as well.

Older people exercise to compensate for biological aging changes, reverse the condition of muscles weakened by disuse, cope with chronic disability or disease, improve mobility and function for aesthetic reasons, and gain a general sense of well-being. Preventing falls is motivated by the threat of injury, but also as a guard against loss of independence. Older people often are guided by their motivation to continue living at home without interference from caring children.

"Why these exercises?" can be answered by relating specific exercises to helping people to cope safely with everyday functional situations, such as regaining control from a trip or near-fall, walking more



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confidently, avoiding shuffling by heel-toe walking, improving the ability to get up from a chair, and reaching into a cupboard.

For further information about older people progressively developing strength and balance, see the Strength Training and Balance Training sections that follow.

Research has proven that home-based strength and balance exercises can reduce falls (Campbell et al., 1997). The Exercise Manual used in Stepping On is derived from exercises known to reduce falls. This is useful information for participants in the Stepping On Program, who can then feel confident that they are spending time and effort wisely. It is important to do all of the exercises with the participants in Sessions 1 and 2 and include some exercises in each session thereafter. These exercises are a key element of the program.

There is a participant Exercise Manual following Session 1. Each person receives a manual. It is helpful to make the manual spiral-bound and the cover a bright color. The binding makes it easy to use and the bright color of the cover serves as a cue to exercise.

### **Modifying and advancing exercises**

To improve balance and strength, exercises must be kept challenging. The key concept is that, as people improve, the exercises must get harder. While we recommend that everyone start at a low level, some individuals will need to advance quickly and others will take more time. Celebrate achievements in the group. Some people may need modification of particular exercises due to pain or other limitations. Observing how participants walk into class, what walking aids they use, and how they get in and out of chairs may give you cues as to who may need modifications to exercises. The Leader/PT Exercise Guide below describes the exercises we chose and ways to advance or modify them. The comments will help leaders to break down the exercises so that people understand how to do them.

To advance side-hip- and knee-strengthening, participants will use weights. To get them comfortable with this, they start by using the ankle weight strap without any weights in Session 1. Give participants the ankle straps and weights to take home. Use adjustable weights to allow for more flexibility. In Session 2, you can start with 2-pound weights for those who are ready. Participants can gradually increase by 1 pound when the exercise feels “too easy.” The adjustable weights also allow different weights to be used with different muscles or decreased for a while if the person experiences an illness.



We all need reminders about how to do an exercise. Participants will not be able to take in instructions all at once. You need to reinforce and answer many questions over the 7 weeks. In particular, in Session 3, we talk more about how to advance exercise, although advancing is encouraged in every session.

### **Safety precautions and contraindications**

Physical therapists and exercise leaders may want to review excellent articles about exercise programs for falls prevention — the Otago New Zealand exercise program (Robertson, 2002; Sherrington, 2008) and the Maria Fiatarone-Singh exercise prescription (Ades et al., 1996; Fiatarone et al., 1990). These articles provide more examples and choices than we use in our program. These may be useful for groups that are meeting over a longer timeframe, or if a participant gets individualized exercises from a therapist.

At registration, participants are instructed to check with their doctor about participation in the balance and strength exercises. Make sure you know each person's limitations and do not stress them beyond these.

Exercise is beneficial on all levels: physical, psychological, and functional. A lack of physical activity and exercise is a danger to health. Randomized controlled trials have shown strength training to be beneficial for arthritis. Older people of any age are able to increase resistance and advance weights but should do so progressively, beginning within their individual existing capabilities and medical limitations.

Strength training improves walking endurance (Ades et al., 1996). Strength and balance exercises should be a precursor to aerobic exercise, such as walking. Improved strength and balance makes walking easier, more pleasant, and safer.

Demonstrate how to put on and take off the weights safely while sitting. Recommend having the chair near the counter so participants do not walk with the weights on. At home, participants should use a kitchen counter or sink for support while doing the exercises. The balance exercises must begin within the individual's existing capabilities, and safety precautions should be highlighted as the exercises are advanced. Participants need to hold on until they feel able to be challenged at the next level, without the support of holding on. If someone uses a cane or walker, the person should start by holding on to the counter with both hands. They then should be able to progress to less support as they improve.



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Ask participants to report any pain and modify exercises if necessary. The most common modification has been for the hip-strengthening exercise, due to back pain. Contraindications to a strengthening exercise would be if the joint hurts while the person is doing the exercise. If it is joint pain, the exercise should be modified so the person can work in a pain-free range. If dizziness, chest pain, or shortness of breath occurs during the exercises, advise the person to stop and contact his or her doctor. The contraindications to balance exercises are the same. If the joint hurts while doing the exercise, the exercise should be modified. Participants with total hip replacement should avoid the sit-to-stand exercise until they are 6 months past the surgery or cleared by their surgeon. They also will need the knee-strengthening exercise modified so they don't bend the hip too much; this modification will produce a slouched posture in the chair. They will need the heel-toe (tandem) standing and tandem walking modified so they don't put one foot directly in front of the other. Instead, they should place the foot on the side of the replaced hip, slightly out to the side.

### **Strength training**

Muscle fiber, and thereby strength, begins to decrease after the age of 50 and decreases more rapidly after the age of 70 (Mazzeo et al., 1998). This can be associated with a general reduction in physical activity. However, weakness and disuse are reversible at all ages. People in their nineties can increase muscle strength by progressive strength training (Fiatarone et al., 1990).

A weak, shuffling gait is a falls risk. Strength training increases muscle mass and strength and improves bone density. Increased strength of quadriceps has a direct relationship to gait (Fiatarone-Singh, 2000) and gives the person both the speed and ability to use the "heel-toe" action with confidence. Weight-bearing exercise reduces the risk of osteoporosis.

Muscles must be overloaded to see any strength gain, and the overload must be progressively advanced by adding resistance. Gravity may be enough at first. Moving and lifting slowly, avoiding the use of momentum, also adds resistance. Standing up from a chair is a challenging exercise because it is difficult to do in a controlled, slow movement. Pausing between each lift allows the muscles to come to rest and ensures that the person uses new and not stored energy. Observe how people do each exercise to ensure that they target the correct muscle group.



When first learning a strength exercise, the most important concept is quality. What does “quality” mean in this context? It means the participants are using the correct, targeted muscle group, not “cheating” with other muscle groups. If they perform a movement incorrectly, they may stress joints or muscles, causing pain. The first time they do the exercise, they should be able to do it without signs of fatigue. What are these? Shaking, not being able to do the full range, starting to have pain or stress on the joint, or loss of good posture all are signs of fatigue. The number of repetitions should be modified during the first session if necessary so the person doesn’t show fatigue.

Progressive resistive training is advanced by increasing both the number of repetitions and the weight. (We’ll discuss advancing more in Session 3.) “Progressive” means advancing slowly and continuously. In the group setting, individuals do this by self-monitoring. The time to advance is when they find the exercise no longer difficult to do. Participants can advance weights at any time over the 7 weeks and thereafter by adding more of the adjustable weights over time. At Session 2, the leader should give the participants weights to take home (at cost or for free). Participants can write down the weight they currently are using in their Exercise Manuals; for example, 2 pounds. In general, the weights are increased by 1-pound increments whenever the exercise becomes “too easy” with the current weight.

A common strength measure is one repetition maximum (1RM); that is, the largest weight that can be lifted through the full range of the motion of the exercise for 1 repetition only. Moderate intensity would be using a weight that is 60–70% of the 1RM. We do not teach people this; we start off with everyone using gravity as resistance for the first week and, if they are ready, using weights starting the second week. We teach participants to take control and self-monitor using a weight they can lift for 10 repetitions with good quality. While the gains of intensive exercise for older people are much more impressive than moderate-intensity exercise (Fiatarone-Singh, 2000), there are still gains with moderate exercise — a level that people may be more inclined to maintain.

The muscles should be rested on alternate days when doing intensive resistive muscle-strength training. The strength exercises are to be done 3 days per week.



### Balance training

Balance requires the integration of motor and sensory systems as well as the cerebellum and other brain centers, such as the basal ganglia. It requires perceptual interpretations and transmission of information. The integration of this system can be enhanced by balance practice, but balance improvement seems to be task specific, so the exercises must be closely aligned with function for improvement to carry over successfully to functional tasks.

Improving balance (Fiatarone-Singh, 2000; Mazzeo et al., 1998) involves progressively more difficult activities that:

- Reduce the base of support from a wider base to heel-toe tandem standing to standing on one leg.
- Are dynamic and challenge balance. Standing and exercising with weights will be a challenge for some people. Challenging balance involves postural changes and weight transfer; the heel-toe (tandem) standing exercise is excellent for this purpose, when done correctly. Capabilities are very individual, and this exercise may often be challenging to younger leaders as well. Gradually reduce hand support as the exercise becomes too easy until it can be done safely without support. The balance benefit becomes evident when hand support is removed (Keith Hill, personal communication, June 2002).
- Involve muscle groups important to posture, such as the calf muscles. Thus, the heel and toe raise exercises also help with balance.

“If you don’t use it, you lose it” applies to balance as much as strength. Balance can be improved and the gains maintained by regular practice. There is very strong evidence that improving balance reduces falls.

### Sustaining exercise

There are a wide variety of barriers to starting and sustaining exercise. These can be acceptance that weakness and poor balance are just part of aging, not having enough time, not understanding the need to exercise or the method of doing so, fear of falling, lack of confidence in one’s ability, not having a planned program with gradual increases, and lack of immediate physiological feedback when hitting a plateau at certain levels.



In the program, we address these barriers in many ways — assisting people through the decision-making process to try to reach an ongoing commitment to exercise, teaching them how to do the exercises, and continually reinforcing why it is important to do them. Increased knowledge and skill and a sense of confidence that they can do the exercises will make a difference (Lachman et al., 1997). For example, the excuse of “not enough time” to exercise needs to be reframed to “how you fit it into daily routines and lifestyle.”

Daily self-monitoring can increase exercise activity by about 35% (Hillsdon et al., 1995). Give out the Exercise Logs weekly (different colors for each week) as one way of self-monitoring and helping people to get into the habit of regular exercise.

In our experience, those people who become committed to the exercises find a particular time of the day to incorporate them into their daily routine. As one man said, “It’s just like brushing my teeth.” Others may find it easier to incorporate some of the exercises as they go about their daily lives. Some examples are doing the heel raises or heel-toe standing while on the telephone or waiting in line with a shopping cart, sideways walking down the hall or to the front door, or doing the leg strengthening while watching TV at night.

Some people need to find a community group to help them sustain their exercising. They enjoy the contact, and the organized activity helps them continue it. We still encourage people to continue the home exercises as a supplement to a community class to reach 3 times a week for the strengthening exercises and daily for the balance exercises.

Once people have established the habit, the most common barrier is a relapse; that is, not starting again after a break. Maintaining the exercises in a very modified form during illness or holiday periods has helped some people get back to the full routine. It seems easier to increase the amount than to begin again after stopping completely. Tell people that it’s okay to miss a day of exercise — they are still getting benefits. They should go ahead and get back to their routine after a break. The 3-month booster session gives an opportunity for people to hear how others have coped or struggled with relapses and gives a boost to keep going.

Cueing is essential for many people. Leaving the weights or the exercise book in a particular spot is a common exercise cue that works.



### Introduction to the exercises

There are many different exercises to improve strength and balance. Those we include here are from the original Stepping On Program. We recommend that only these exercises be used as part of the program. Sometimes a participant may not be able to do one or more of the exercises. The therapist can modify them at the first or second session if needed. Modifications are described in the following two sections. If a modification doesn't work, the therapist can draw on his or her expertise for alternative exercises. We recommend not adding more exercises for two reasons: (1) participants need enough time to learn the existing exercises correctly, and (2) they need to maximize adherence to existing exercises to prevent overloading.

### Strengthening exercises — general tips

- Find a good place to do these exercises. For class, the person may need to use the back of a chair, a table, or a wall to which they can hold on for standing exercises. For home, we recommend a kitchen counter for the side-hip-strengthening and heel and toe raises. The person should wear firm, sturdy shoes so the foot doesn't wiggle and wobble. We recommend a sturdy chair with a back (like a kitchen chair) for the sitting knee-strengthening exercises.
- Correct technique and good quality movements are important for targeting the desired muscle groups.
- Breathing — Remind them never to hold their breath while lifting. Start the lift on an exhale. Exhale while lifting slowly. Inhale when relaxing.
- Do movements slowly. Both the lift and lower phases of the exercises should be done slowly and in a controlled manner to prevent pain and achieve maximum benefit.
- Advancing — First, advance the number of repetitions (to a maximum of 10 for leg raises and side-hip raises and 20 for heel raises). As a general rule, once the person can do the starting number of repetitions with the last repetition still feeling easy, repetitions should be increased. Keep working up to the maximum recommended number by increasing when the last repetition feels easy. At the first session, you may want to explain the concept of increasing repetitions with strength exercises. If participants are showing good exercise quality and understand how to increase repetitions, they should feel comfortable doing an exercise on their own, going up to the maximum number recommended as they are able. This may occur between week one and two.



- Advancing — Second, add weight (for knee strengthening and side-hip-strengthening). Start adding weights when 10 repetitions become easy. Start with 2 pounds. Each time 10 repetitions become too easy with that amount of weight, add another 1 pound.

### Balance exercises — general tips

- Find a good place to do these. In class, the participant may need to use the back of a chair, a table, or a wall to which they can hold on for standing exercises. At home, we recommend a kitchen counter for sideways walking, heel-toe (tandem) standing, and heel-toe (tandem) walking. The person should wear firm, sturdy shoes so the foot doesn't wiggle and wobble. We recommend a sturdy chair with arms for the sit-to-stand exercise.
- Lining up correctly will help people to find their balance point above their feet and help them feel more stable.
- Looking straight ahead helps promote good posture during the standing exercises.
- Advancing — The first way of advancing is by gradually holding on less and less, then letting go altogether (but keeping the hand close to the support). People should advance once an exercise becomes too easy. First, they may go from hand to fingertip support, then to the hand placed just above the support with frequent touches, then to fewer and fewer touches. This process is gradual, and participants should feel confident that they can advance while still using touches as needed. It is preferred to make lower body adjustments, such as a recovery step, instead of touching. Sometimes people need encouragement to challenge themselves.
- To improve, people need to do a balance exercise consistently.

The next sections, “Leader/PT Exercise Guide,” are for the leader and therapist. The therapist will use these instructions to teach the exercises and modify them as needed. The leader will use them to make sure the exercises are done properly and advanced in future sessions.

