



***NEW LEAF TRAINERS***

# Strength & Balance

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The Falls Prevention Programme

## Contents Page

About New Leaf Trainers Falling and Fractures	Page 3
Reducing Falls through Physical Activity Background to Strength & Balance	Page 4
Mission Objectives Aims	Page 5
Inclusion Criteria Exclusion Criteria Programme Structure and Delivery	Page 6
Staff	Page 7
Strength & Balance Packages: Option 1 Option 2	Page 8
Option 3 Venue	Page 9
When? Where? Programme Evaluation Where Next?	Page 10
Further Information Contact Information	Page 11
Appendix 1 - Pilot Study	Page 12
Appendix 2 - Graphs	Page 16

## About New Leaf Trainers

New Leaf Trainers are a leading nationwide Health Promotion company specialising in delivering bespoke Health & Fitness Programmes, Weight Management Advice, Dietetic Consultations, Physiotherapy, Personal Training, Falls Prevention and Cardiac Rehabilitation.

The company provide a unique health and fitness experience to motivate people of all ages into making educated lifestyle choices for improved lifelong health and wellbeing.

New Leaf Trainers are a team of experienced and highly qualified Exercise and Nutrition Scientists, Exercise Physiologists, Dietitians, Physiotherapists, Nurses, Cardiac Rehabilitation Instructors and Personal Trainers.

## Falling and Fractures

Falls represent the most frequent and serious type of accident for people over the age of 65 and are the leading cause of death from injury among people over 75 in the UK. According to the Department of Health (DofH, 2009), 35% of over-65s experience one or more falls each year. They also report that about 45% of people aged over 80 who live in the community fall each year and between 10 and 25% of such fallers will sustain a serious injury. Falling can result in a range of adverse outcomes, from minor bruises to fractures, destroying confidence, causing disability, increasing isolation and reducing independence. The consequences after affects from even the most minor fall can be catastrophic for an older person's physical and mental health. The Annual European Home and Leisure Accident Surveillance Survey (EHLASS) Report UK (2000) reported that every five hours someone dies after an accidental fall in the home. The report also stated that after a fall, 48% of older people report a fear of falling and 25% have a functional decline.

Hip fractures remain the most serious consequence of a fall and the commonest cause of accident-related death in older people - 20% die within four months and 30% within a year (DofH, 2009). Fractures of the hip require major surgery, as well as inpatient care in acute and often rehabilitation settings, and ongoing recuperation and support at home from NHS community health and social care teams. In addition, a hip fractures is the event that prompts entry to a care home in up to 10% of cases (DofH, 2009).

It is estimated that the overall direct healthcare cost of fractures caused by falls to the NHS is over £1bn per year (EHLASS, 2000). One hip fracture costs between £12-15k each and occurs every ten minutes.

## **Reducing Falls Through Physical Activity**

There is a tremendous amount of evidence to suggest a reduction in falls can be achieved through a programme of Strength and Balance exercise.

According to the Department of Health (2009), research over the past three decades has advanced the understanding of the common predisposing risk factors to falling. This has provided important insights into the prevention of falls, including the use of specific strength and balance training.

Risk factors that can be modified with the use of specific exercise include poor balance and fear of falling, low strength and power, poor gait and functional ability, depression, urinary urgency and incontinence, postural hypotension, depression and arthritic pain (Skelton, 2001).

## **Background to the Strength and Balance Programme**

The Strength and Balance programme originally began with funding from the National Lottery which enabled New Leaf Trainers to run a ten-week Falls Prevention Programme in sheltered accommodation in Chester.

The participants took part in a weekly structured exercise class for ten weeks. Functional tests were performed on week one and again on week ten to use as outcomes measures for the programme (appendix 1).

Alongside the exercise sessions were short educational discussions in areas relating to Falling and Fracture Prevention. Participants were also given a simple and safe home exercise programme to supplement the weekly classes.

This initial programme was extremely successful and the results (appendix 2) showed promising improvements in the participants' strength, balance and general function. Qualitative feedback included a reported increase in general confidence and a decrease in fear of falling. The results from this pilot programme were showed to the Falls Prevention Coordinator of Western Cheshire PCT. The Coordinator was able to secure further funding for three Falls Prevention programmes across Western Cheshire. This has now grown to ten concurrent programmes, all proving to be extremely successful and popular within the community.

New Leaf Trainers are in the process of recruiting for a larger cohort study to further investigate the success of the Strength and Balance Programme. The outcome measures used will be the same as the Pilot Study, but will also include the addition of a Falls Efficacy Questionnaire to investigate the impact the programme has on participants' fear of falling.

## **Mission Objective**

To reduce the incidence of falls and fractures within the community by preventing frailty and promoting bone health, through physical activity and risk factor modification.

## **Aims**

The primary aim of New Leaf Trainers Strength and Balance programme is to reduce and modify the risk factors for falling and the sustaining of related and non-related fractures:

Further aims of the programme include:

- To increase strength, balance, endurance, flexibility, coordination and functional movement in individuals referred into the programme.
- To prevent a first fall by modifying risk factors in individuals recognised as having an increased risk.
- To reduce the risk of falling in frequent or previous fallers by combining group strength and balance exercises with supplementary home exercise programmes.
- To retrain or maintain the ability to get up from the floor to avoid a 'long lie' after a non-injurious fall.
- To increase confidence and reduce the fear of falling in all individuals participating in the programme.

By participating in our Strength and Balance programme, we encourage individuals to also improve their quality of life by:

- Increasing levels of regular and habitual physical activity in order to reduce the risk of developing the major causes of morbidity and mortality in older adults.
- Postponing the age-related decrements in physiologic function and preserving independent living.

## **Inclusion Criteria**

For a participant to qualify for our Strength & Balance programme they must meet one or more of the following criteria:

- History of falling
- Family history of osteoporosis
- Feeling unsteady/unstable
- Fear of falling
- Joint stiffness
- Muscle weakness/loss of strength
- Balance problems
- Aged over 60

## **Exclusion Criteria**

If an individual suffers from any of conditions listed below, they are unsuitable for the programme and must be directly referred to an appropriate health care professional:

- Unstable angina
- Uncontrolled hypertension (resting systolic BP > 180 mm Hg or resting diastolic > 100 mm Hg)
- Uncontrolled arrhythmias
- Recent complicated MI or awaiting further investigation.
- Unstable or acute heart failure
- Uncontrolled diabetes
- Severe COAD / COPD
- Acute or systemic illness or fever
- Orthopaedic problems that would prohibit exercise
- Other metabolic conditions such as acute thyroiditis, hypokalemia, hypovolemia etc

## **Programme Structure and Delivery**

All of our exercise interventions have been designed by Physiotherapists and Advanced Exercise Instructors. Exercises focus on improving muscle strength, balance, flexibility and postural stability.

The design and structure of the Strength and Balance classes are in line with the recent Department of Health Best Practice Guidelines (Falls and Fractures: Effective Interventions in Health and Social Care, 2009). The New Leaf Trainers Falls Prevention programme contains the following recommended components:

- Exercise that is evidence based and appropriately tailored to the individual.
- Dynamic balance, strength and functional floor activities.
- Inclusion of bone loading, power, flexibility, postural and gait training, supported endurance work and tasks to improve visual, vestibular and sensory input.
- Exercise that is delivered by specialist trained professionals.
- Exercise to retrain or maintain the ability to get up from the floor to avoid a 'long lie' in individuals with a history of falling.

The intensity of the exercise sessions is gradually increased week by week, starting with seated and supportive exercises and gradually progressing to more complex standing and functional exercises.

Exercise sessions initially last for approximately 45 minutes, gradually increasing to 60 minutes over the 10-week programme.

New Leaf Trainers suggest a maximum of 14 participants per class and only one or two higher-risk patients within a group. Currently, participants must make their own way to and from the class, as transport is not provided. However, encouragement is given to the use of services such as the Plus Bus or similar local schemes.

Following each exercise session, the program further attempts to modify risk factors associated with falling by delivering short lectures and group discussions. A typical ten-week education programme runs as follows:

- Week 2 ~ Risks in the Home and the Environment
- Week 3 ~ Benefits of Physical Activity
- Week 4 ~ Getting Up From a Fall
- Week 5 ~ Importance of Adequate Hydration / Water Quiz
- Week 6 ~ Medication / Balance and the Senses
- Week 7 ~ Nutrition and Falls
- Week 8 ~ Osteoporosis
- Week 9 ~ Summary

Weeks one and ten are dedicated to enrolment, screening and testing.

## **Staff**

Each session is delivered by two instructors, one of whom is either a Physiotherapist, BACR Phase IV instructor (British Association of Cardiac Rehabilitation), or Level 3/4 Exercise Instructor.

## Strength & Balance Packages

New Leaf Trainers Ltd can tailor the Strength & Balance programme to suit your organisations needs. We provide three basic programme options.

### Option 1

New Leaf Trainers Ltd will deliver solely the exercise and education sessions. We will provide:

- A variety of exercise equipment
- Stereo & CDs
- Stopwatch
- Circuit cards
- Strength and Balance resource packs
- Exercise worksheets

The commissioner will be responsible for booking and funding suitable venue hire.

Invoices will be sent every 10 weeks to coincide with the end of each programme and payment required within 30 days of invoice date.

### Option 2

Option 2 includes all of Option 1 with the addition of the following:

- New Leaf Trainers will organise the venue hire and pay the associated costs directly.
- New Leaf Trainers will conduct risk assessment checks
- Results data will be produced and put into a report every ten weeks

## Option 3

Option 3 includes all of Option 1 & 2 with the addition of the following:

Part time/ Full time Band 5/6 equivalent for administration, promotion and overall running of the programme.

Costs are based on classes running 50 weeks of the year (two week break at Christmas).

For all options, New Leaf Trainers requests that the commissioner will:

- Provide an alternative referral pathway for referred individuals unsuitable for the Strength and Balance Programme.
- Advertise the sessions
- Provide new participants for the classes every 10 weeks.

This above agreement can be ratified in a Service Level Agreement (SLA)

## Venue

For Option 1, the venues for the Strength and Balance programmes are organised by the commissioner. However certain prerequisites need to be met such as:

- The community venues need to be an appropriate size (ideally, 6mX12m)
- Have toilet facilities
- Have disabled access (ramp)
- Have parking / disabled parking
- Have appropriate chairs available
- Must be on a ground floor
- Be local for the participants

New Leaf Trainers believe that local church halls or community venues are particularly suitable for the Strength and Balance sessions.

## **When?**

The Strength & Balance programme is a 10-week course and is delivered between the hours of 9am-5pm Monday to Friday.

Programmes are delivered back to back and classes run weekly, usually inclusive of bank holidays, with the exception of the Christmas period.

## **Where?**

Classes are located within the heart of the community, usually in areas where there are the highest numbers of fallers. Data relating to this can be obtained from local Public Health Departments.

## **Programme Evaluation**

Options 2&3 include provision of results/data and a summary report of the programme.

For Option 1, if requested, New Leaf Trainers will provide this for an extra charge.

## **Where Next?**

At the end of the 10-week programme, depending upon their results, participants graduate and are encouraged to move onto 'Strong and Balanced'. This is a follow-up programme of classes with the aim of further promoting exercise for individuals who have completed the initial 10-week programme.

These are ongoing exercise classes where individuals will pay approximately £2.50 per session to attend. As these classes cost approximately £40 per session, 16 people are required for a financially viable programme to run. Commissioners will be expected to meet the cost of room hire.

If it is felt inappropriate for an individual to progress onto 'Strong and Balanced' immediately following the initial 10-week programme, New Leaf Trainers Staff will allow the individual to continue in the Strength and Balance programme for up to a further 20 weeks.

In Western Cheshire, New Leaf Trainers are working in partnership with organisations such as Age Concern to develop appropriate follow-on programmes.

## **Further Information**

New Leaf Trainers' wider team comprises of Physiotherapists, Dietitians, Nutritionists, Exercise Physiologists, Exercise & Nutrition Scientists and Nurses.

We also provide General and Specialist Exercise, Weight Management, Dietetic Consultations and Cardiac Rehabilitation. All services can be delivered in group sessions or on a one-to-one basis.

New Leaf Trainers Ltd  
Company Director: Paul Stern BSc (Hons) MSc MCSP

Website: [www.newleaftrainers.com](http://www.newleaftrainers.com)  
Telephone: 0844 8003928  
Email: [info@newleaftrainers.com](mailto:info@newleaftrainers.com)

*NEW LEAF TRAINERS PROVIDE A UNIQUE HEALTH AND FITNESS EXPERIENCE TO MOTIVATE PEOPLE OF ALL AGES INTO MAKING EDUCATED LIFESTYLE CHOICES FOR IMPROVED LIFELONG HEALTH AND WELLBEING.*

# Appendix 1 - Pilot Study

## **Aim:**

This interim evaluation aims to assess participants views of the effectiveness of a ten week falls prevention class. The class was run as a pilot to assess whether running such classes could reduce the rate of falls, and fear of falling, amongst those living in sheltered accommodation.

## **Structure of programme:**

The 10-week falls prevention programme took place at a Sheltered Housing complex in Chester. The programme commenced in April 2007 and twelve individuals took part. These individuals were aged between 72 and 87 (mean age  $79.8 \pm 5.4$ ) and all presented with risk factors for falling.

The programme consisted of a structured exercises class followed by an education session.

The exercise component of the programme featured exercises specifically chosen to improve the elements of fitness that are recognised as influencing falls risk. These include aerobic endurance, strength, flexibility and balance.

The education sessions were structured to focus on the risk factors for falling. A different topic area was discussed each week. The sessions were as follows:

- Week 1 – Introduction – What is Falls Prevention? / Testing / Home Exercises
- Week 2 – Keeping active
- Week 3 – Fear of falling / Help available
- Week 4 – Risks in the home
- Week 5 – Risks in the environment
- Week 6 – What to do in the event of a fall
- Week 7 – Eating well
- Week 8 – Medical conditions as risk factors
- Week 9 – Medications as risk factors
- Week 10 – Review and evaluation / The future

On the first week of the programme all the participants were asked to perform three simple functional assessments. These assessments were repeated on the final week of the program. The assessments were as follows:

### **Timed Get Up and Go**

Participants were assessed on the time it took to raise from a standard arm chair and walk to a line approximately three metres away from the chair before turning, returning back to the chair and sitting down again.

### **Single Leg Balance**

The single leg balance test is a measure of balance. It involved timing how long an individual was able to balance on one leg without support. This test was performed separately on both legs.

### Functional Reach Test

The functional reach test is a measure of balance and involved measuring the difference, in centimetres, between an individual's arm's length and maximal forward reach, using a fixed base of support.

#### Results

#### Timed Get Up and Go

Individual	Week 1 (secs)	Week 10 (secs)	Difference (secs)
1	7.8	5.6	-2.2
2	5.0	3.5	-1.5
3	6.5	3.5	-3.0
4	7.3	5.8	-1.5
5	13.0	7.3	-5.7
6	8.3	6.8	-1.5
7	4.7	4.3	-0.4
8	7.2	6.3	-0.9
9	8.2	3.8	-4.4
10	5.4	/	/
11	9.7	/	/
12	7.5	/	/
Average (of subjects tested twice)	7.6	5.2	-2.4

### Single Leg Balance

Individual	Week 1		Week 10		Difference	
	Left (secs)	Right (secs)	Left (secs)	Right (secs)	Left (secs)	Right (secs)
1	7.1	3.1	7.8	5.9	+0.7	+2.8
2	4.0	2.5	6.8	6.3		
3	10.2	10.4	25.3	83.3	+15.1	+72.9
4	4.0	2.0	6.1	7.2	+2.1	+5.2
5	3.0	3.0	3.7	2.5	+0.7	-0.5
6	2.5	3.5	2.8	2.1	+0.3	-1.4
7	6.5	7.0	14.2	28.0	+7.7	+21.0
8	3.5	2.3	55.3	22.0	+51.8	+19.7
9	7.5	8.0	21.6	27.5	+14.1	+19.5
10	4.0	4.0	/	/	/	/
11	2.3	1.2	/	/	/	/
12	3.2	9.5	/	/	/	/
Average	4.8	4.7	16.0	20.5	+10.3	+15.9

## Functional Reach

Individual	Week 1 (cm)	Week 10 (cm)	Difference (cm)
1	24.0	41.0	+17.0
2	24.0	38.0	+14.0
3	33.0	51.0	+18.0
4	23.0	27.0	+4.0
5	8.0	25.0	+17.0
6	22.0	29.0	+7.0
7	27.0	33.0	+6.0
8	21.0	27.0	+6.0
9	22.0	26.0	+4.0
10	20.0	/	/
11	11.0	/	/
12	21.0	/	/
Average	21.3	33.0	11.7

### Comments from participants

'Since attending the classes my balance has improved'

'The home exercises I was given were very useful'

'I have improved my knowledge of food'

'The leaflets I was given are very interesting'

'Since attending the classes my shoulder mobility has improved'

'I have learnt some very useful facts about nutrition'

'I particularly enjoy the social element of the classes'

'I have learned how to get up after a fall'

'I feel more energetic and cheerful!'

'I no longer have pain in my knee'

'The classes have reinforced some food facts'

'I am now sleeping better'

'The classes help to keep me mobile'

'I am now walking better'

'I still want to improve my balance'

'The classes help to keep you safe'

'I feel better and I enjoy the social element'

'I have learned more'

'I enjoy the exercise'

'The classes have encouraged me to do more exercise'

'I feel more confident!'

'Before attending the classes I couldn't put one foot in front of the other, but this has improved'

'I've learned a lot'

'I enjoy the sessions!'

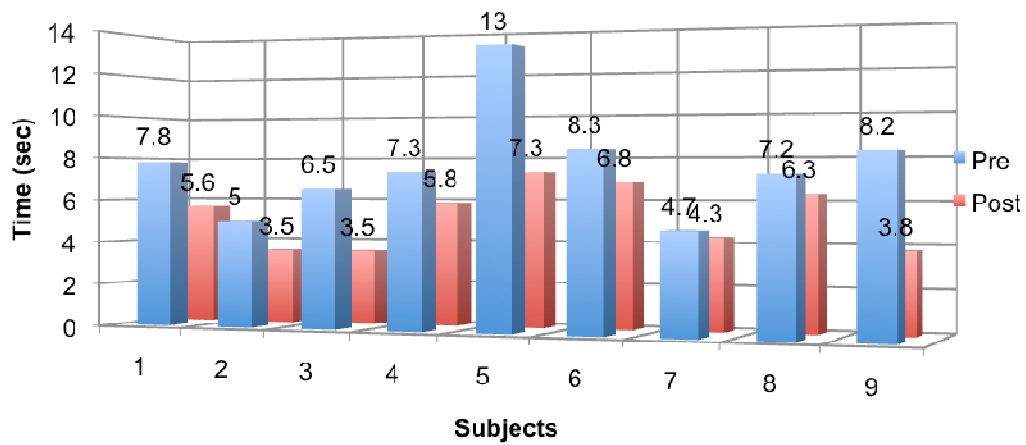
**Conclusion:**

What can be seen is that over the course of the ten weeks most participants' balance and reach has improved, some significantly. The most interesting results can be seen in the participants' comments. They appeared to attach great social significance to attending the class and working together as a group. It would also appear that a new found confidence has developed in a number of the participants who reported feeling less fearful of falling.

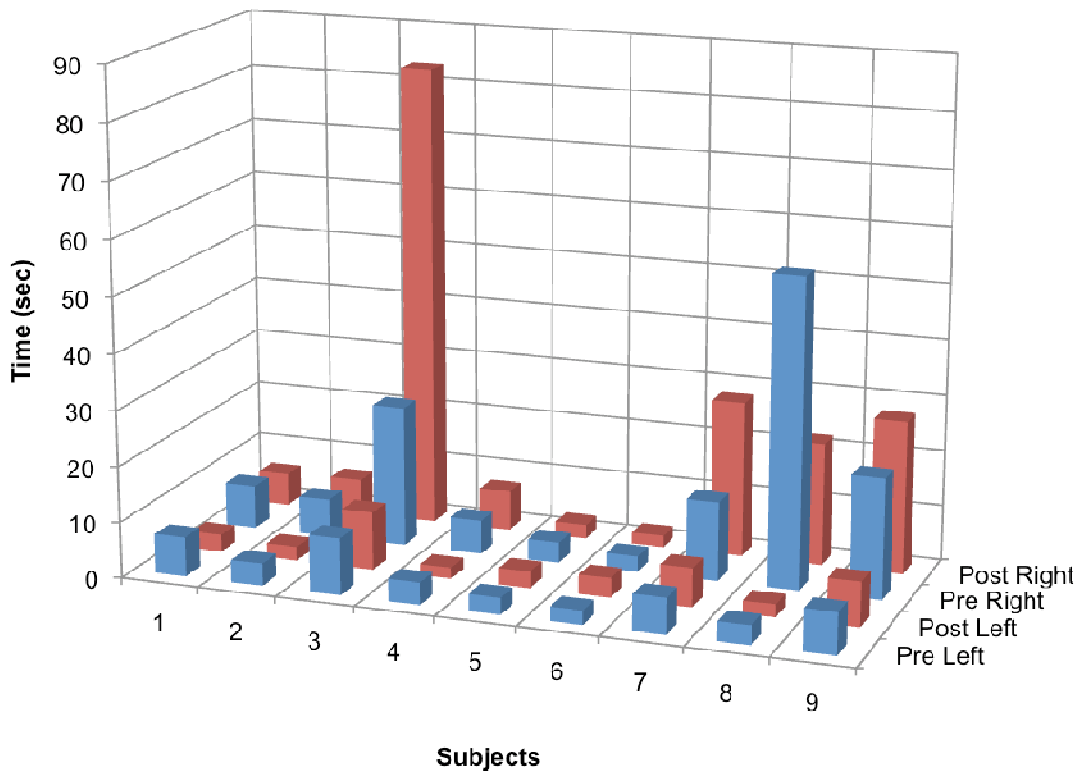
It is suggested that similar falls prevention programmes are repeated for a longer period of time so that a full evaluation is able to take place with a larger cohort of participants.

## Appendix 2 - Graphs

### Timed Get Up & Go



### Single Leg Balance



## Functional Reach

