

# LifeTrail Research Study – Fall 2009

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Ian Proud

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## Introduction

The LifeTrail™ is an outdoor exercise system designed for people over 55 years of age. There are twenty activities grouped around seven three-sided stations. The system is based on Functional Fitness principles and offers three levels of challenge for each activity.

The system was installed at RiverWoods Senior Living Community in Lewisburg Pennsylvania. The system can be assembled in many different ways. The method used for RiverWoods was to place all the wheelchair accessible activities on two separate stations. The five stations with exercises for ambulatory people were the ones used in this study.

The testing and resident usage was coordinated and executed by RiverWoods staff with help from Playworld during October and November 2009.

## Summary

Use of LifeTrail by the participants appeared to lead to substantial changes in strength and balance. The changes observed in agility and dynamic balance testing were also substantial. The aerobic endurance results showed a slight improvement overall.

Measured Capability	Test	Average Result
Lower body strength	Chair Stand	31% improvement
Upper body strength	Arm Curls	49% improvement
Agility & dynamic balance	8' Up-and-Go	14% improvement
Aerobic endurance	6 Minute Walk	6% improvement

## Test & Sample Description

The basis of the test was Rikli & Jones' Senior Fitness Test. This was administered immediately before and after a 6 week period of LifeTrail usage. The name of each test, a description and what is being measured is below:

- **Chair stand test** – max sit-to-stand reps in 1 min. (lower body strength)
- **Arm curl test** – max reps in 1 min. (upper body strength)
- **Chair sit & reach** – reach to toes, distance (lower body flexibility)
- **6 min walk test** – distance covered in 6 minutes (aerobic endurance)
- **Back scratch test** – distance between fingertips behind back (upper body flexibility)

- **8 foot up-and-go test** – From a seated position to standing, around a cone 8 feet away and back to seated position (agility and dynamic balance)
- **Height & weight**

This testing was performed indoors in a temperature-controlled environment. The study participants were asked to add the LifeTrail regimen to their daily activities. The subjects were not asked to make any other changes than adding LifeTrail to their daily routine.

16 people, 15 females and 1 male, completed a post-test. Their ages ranged from 64 to 92, with an average age of 77.8 years.

No record was kept as to frequency of use of LifeTrail by the participants.

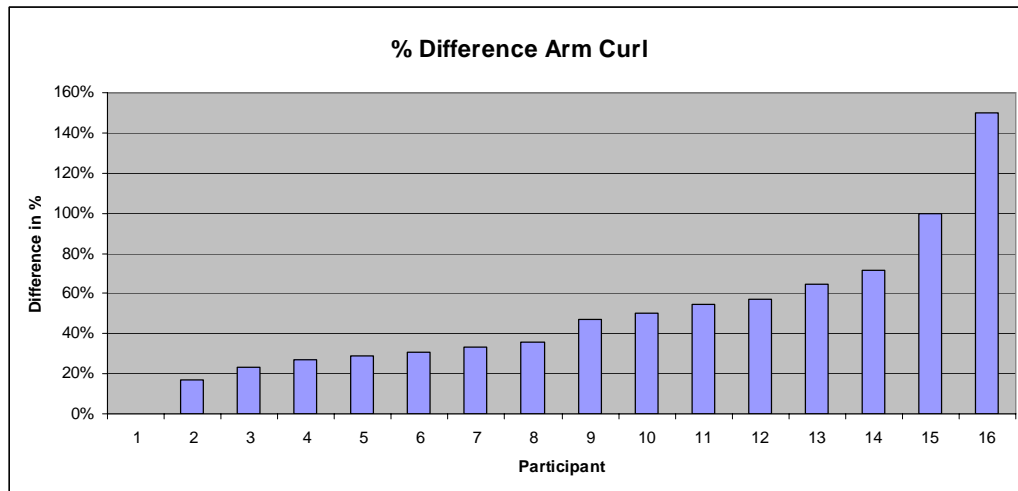
## Observations

### *Upper Body Strength*

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The arm curl test requires the participant to sit on a chair without arms, with their dominant side close to the edge of the seat. A dumbbell is held in the dominant hand and curled up to the shoulder. The score is the number of curls completed in 30 seconds. Women used a 5-lb, men used an 8-lb dumbbell.

This movement is considered a test of upper body strength since it requires the muscles of the shoulder and upper body to be in a similar condition to move the weight effectively.



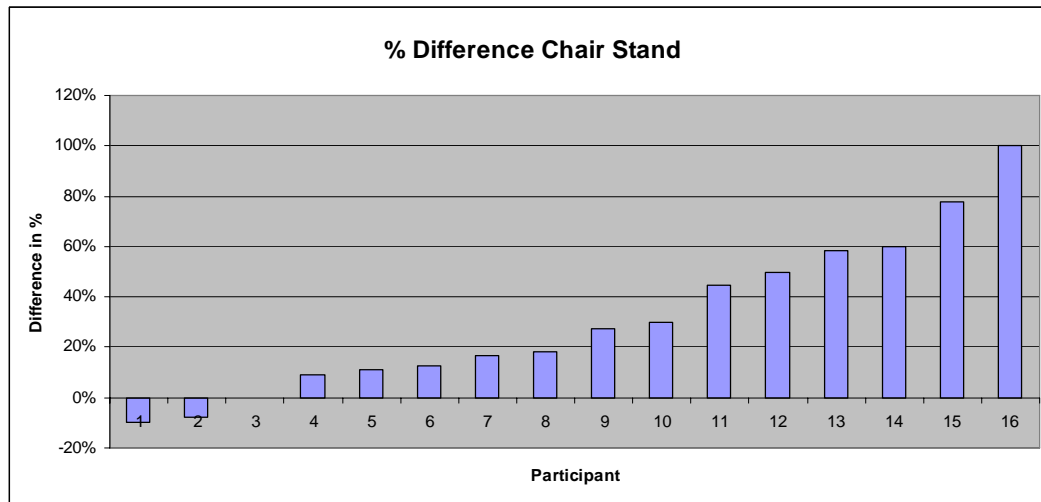
**Results:** As the chart above shows, 15 of 16 people improved their score after using LifeTrail for 6 weeks. Those improvements ranged from 17 to 150%, averaging 49%. No participant ended with a test score that was less than their starting score.

## *Lower Body Strength*

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The chair stand test requires the participant to sit on a dining chair with their arms crossed across their chest. One rep is rising to a full standing position and returning to a seated position. The score is the number of full stands completed in 30 seconds.

Since this movement demands that the muscles of the legs and lower torso work in conjunction with one another to perform this action, this is considered a test of lower body strength.



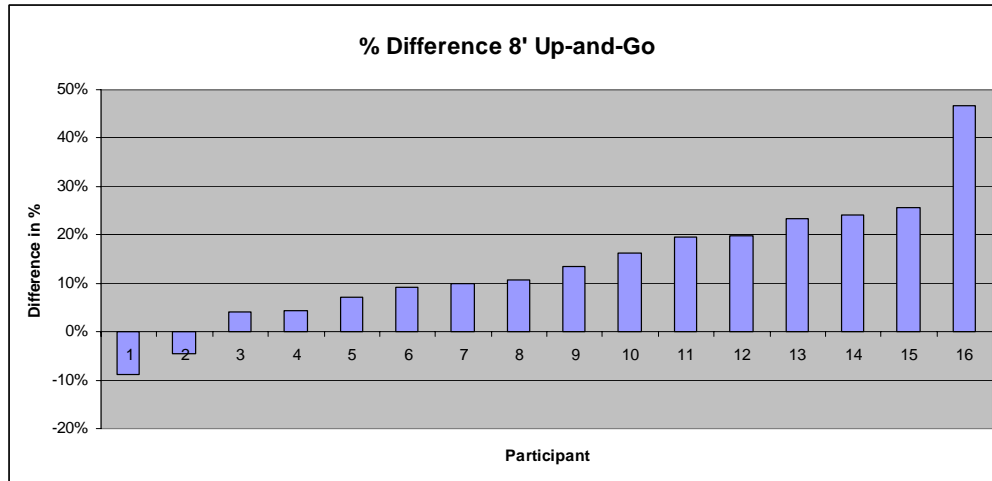
**Results:** 13 of 16 participants gained strength in their lower body, with an average improvement of 31%

## *Agility & Dynamic Balance*

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The participant begins by sitting in a chair, and on a signal stands up and moves as quickly as they can around a cone 8 feet away, returning to the chair. The score is the time in seconds from leaving the chair until the person sits down again.

This requires coordination between sensory, motor and cognitive systems as the person rises to their feet, accelerates, decelerates, turns 90 deg, accelerates again, stops, turns 180 deg to sit and lowers themselves into the chair.



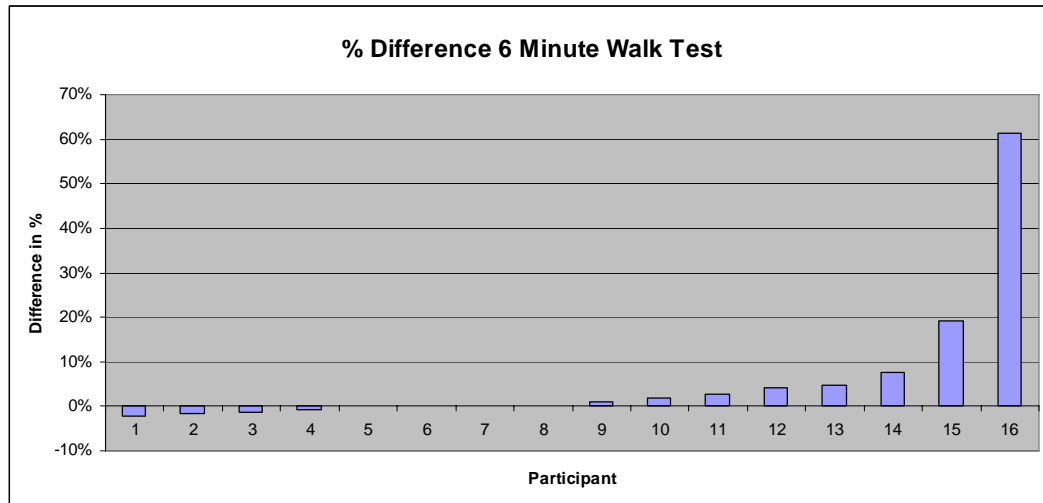
**Results:** 14 of 16 participants improved their times in this test for an average improvement of 14% and a median of 12%.

### *Aerobic Endurance*

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The 6 minute walk was held on an indoor 50 yard course. The participants walked as quickly as possible around this course. They were stopped in place after 6 minutes had passed.

25% of the sample saw a slight decline in their aerobic performance, another 25% walked the same distance as their pre-test and the remaining 50% improved their performance. Building aerobic endurance is not a stated goal of LifeTrail.



**Results:** This test delivered mixed results with 7 of 16 participants improving their distance traveled in the test. The average gain was 6%, the median 0%.

## Notes

The Sit & Reach and Back Scratch test data was not gathered in a sufficiently consistent manner to make it useable for this report.

## Recommendations for Further Testing

The Senior Fitness Test has a reporting form that is open to interpretation. It is recommended that a new form be created that reduces the possibility of interpretation, especially in the Sit & Reach and Back Scratch Tests. In addition, more tester training is recommended to increase the consistency of the data recording.

The 8' Up and Go Test was completed by many residents in 4-6 seconds. Differing reaction times and the difficulty of perceiving exactly when the participant actually touched down on the chair mean that large recording errors are possible. These timing errors might be reduced as a percentage of the whole if the test was composed of two or three reps, rather than the currently prescribed single rep of chair – cone – chair.

Additional policies should be made governing the use of walking frames during the 8' Up-and-Go, and the 6 Minute Walk Test.

RiverWoods is a community where the residents live in and amongst the LifeTrail locations. This makes tracking usage a challenge, but this needs to be addressed in future testing.

## Acknowledgements

Thanks to the management and staff at RiverWoods Senior Living Community especially Tony Cooper and Karla Mitchell for making this study possible.

Special thanks to Ashley Geiser, Wellness Director who led the effort to coordinate the tests and led programmed LifeTrail activities.

Alex Armstrong helped with testing and helped lead LifeTrail activities.