Functional Fitness Assessments for Mature Clients

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Dr. Dan M. Ritchie, PhD
Functional Aging Institute
Miracles Fitness
Creator, Never Grow Old Fitness Program

Cody Sipe, PhD

- 20 years industry experience
- Over 100 presentations internationally
- Over 30 published articles
- 2005 IDEA Program Director of the Year
- Advisory Boards for National Posture Institute, International Council on Active Aging, Act!vate Brain and Body, ACSM, CFES, WCAA
- Editorial Boards: IDEA, Faith and Fitness Magazine, Boomerbloomer.com

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Dan Ritchie, PhD, CSCS

16 years experience

Certified Strength and Conditioning Specialist

FallProof Balance and Mobility Enhancement Specialist

Enhance Fitness Master Trainer

2014 PFP Personal Trainer of the Year

Owner, Miracles Fitness

President, Functional Aging Institute

Creator, Never Grow Old Fitness Program

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Discover How To Train The Largest & Wealthiest Untapped Market In Fitness History

If you want to be one of the elite few personal trainers to establish themselves as an authority with this untapped population, while creating an incredible income and securing your future in the fitness industry, then you need to act now to take advantage of this incredible opportunity.

So Who Are These Prospective Clients?

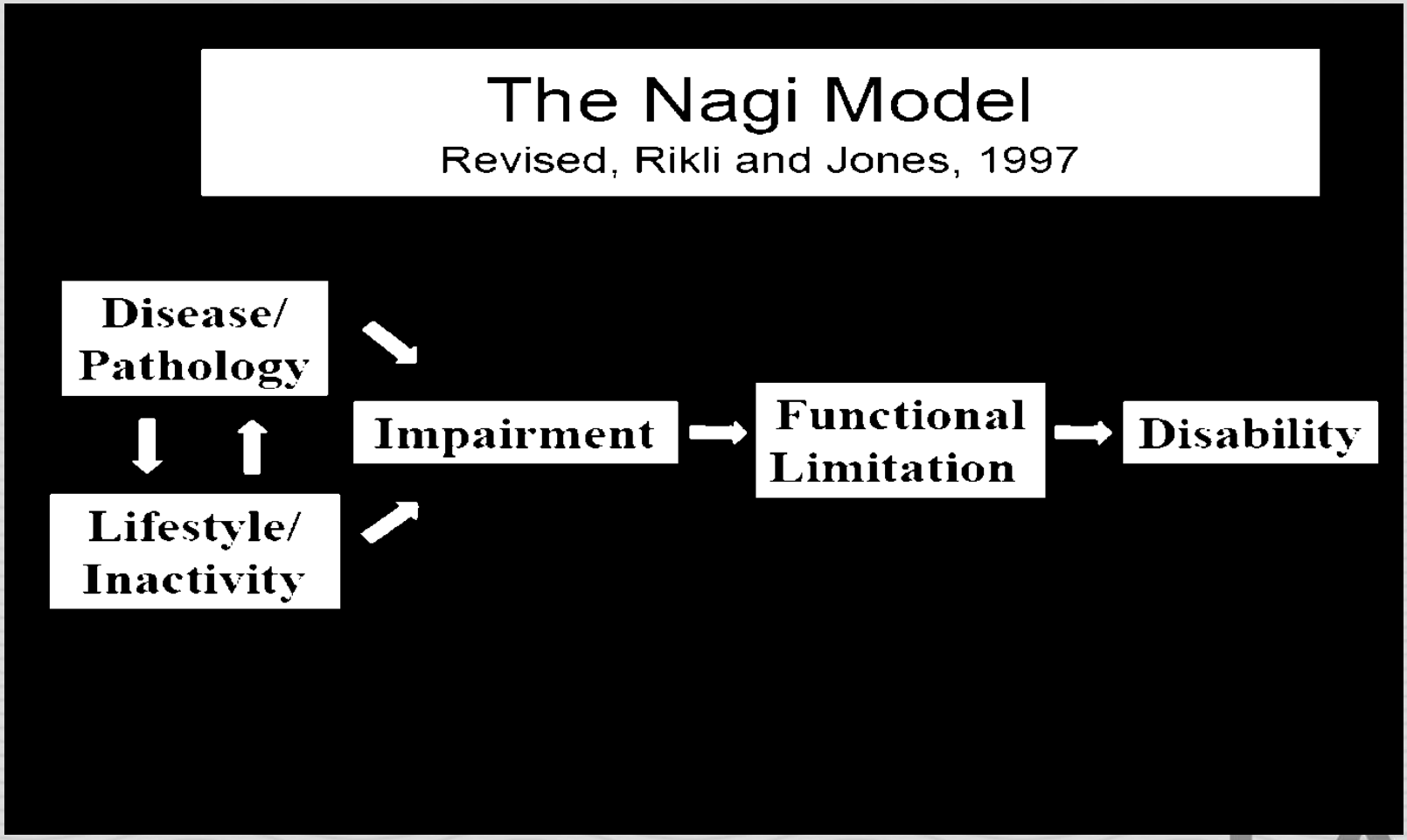
- They are the largest and fastest-growing population segment in the world
- They are the ONLY growing segment of the fitness industry (all others are shrinking rapidly)

Get Your Free Functional Training Starter Kit

Why Functional Assessment?

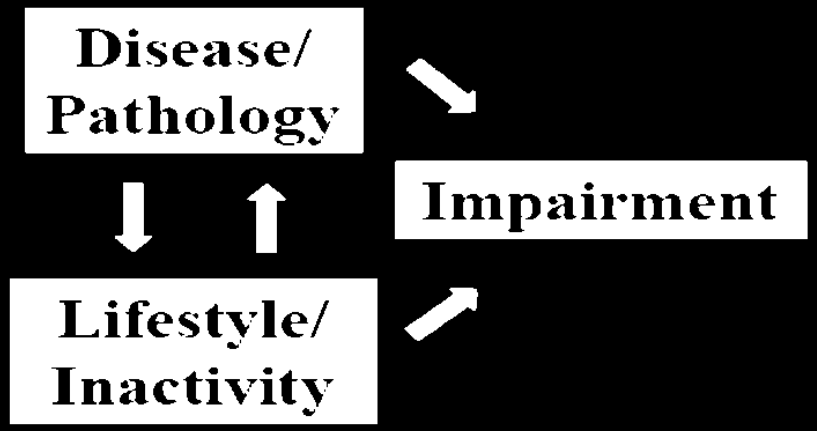
- Drive Sales
- Identify Deficiencies
- Determine Need for 1-1
- Determine Appropriate Small Group
- Quantify Improvement
- Testimonials/Marketing
- Assess Risk
- Demonstrate Expertise

What is a Functional Assessment?



The Nagi Model

Revised, Rikli and Jones, 1997



Muscular Strength

Flexibility/ROM

Muscular Endurance

Cardiorespiratory Endurance

Muscular Power

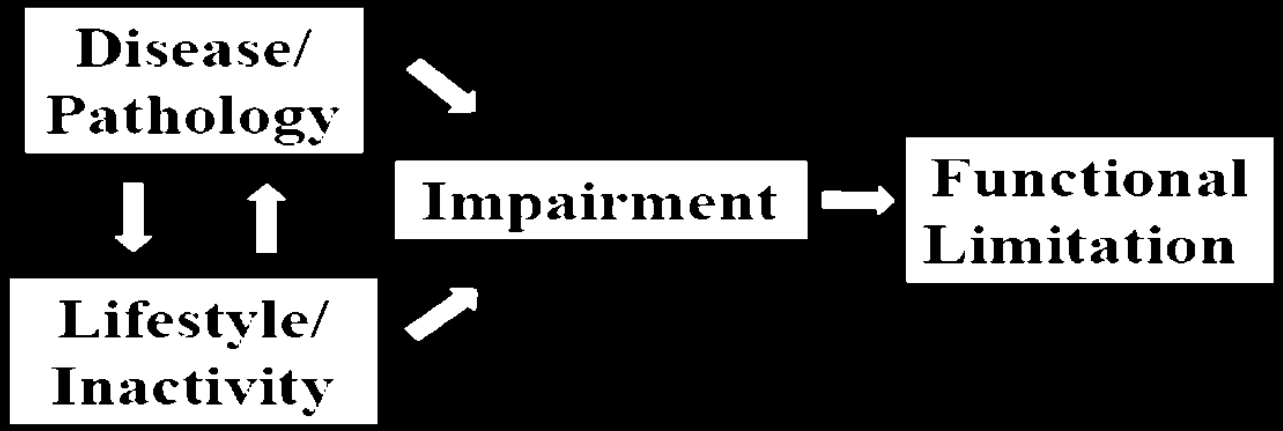
Speed

Reaction Time

Coordination

The Nagi Model

Revised, Rikli and Jones, 1997



- Climbing Stairs
- Standing
- Walking
- Cooking
- Cleaning
- Carrying
- Lifting
- Driving
- Bathing

Functional Assessments

Balance

Gait, Mobility, Agility

Task Performance

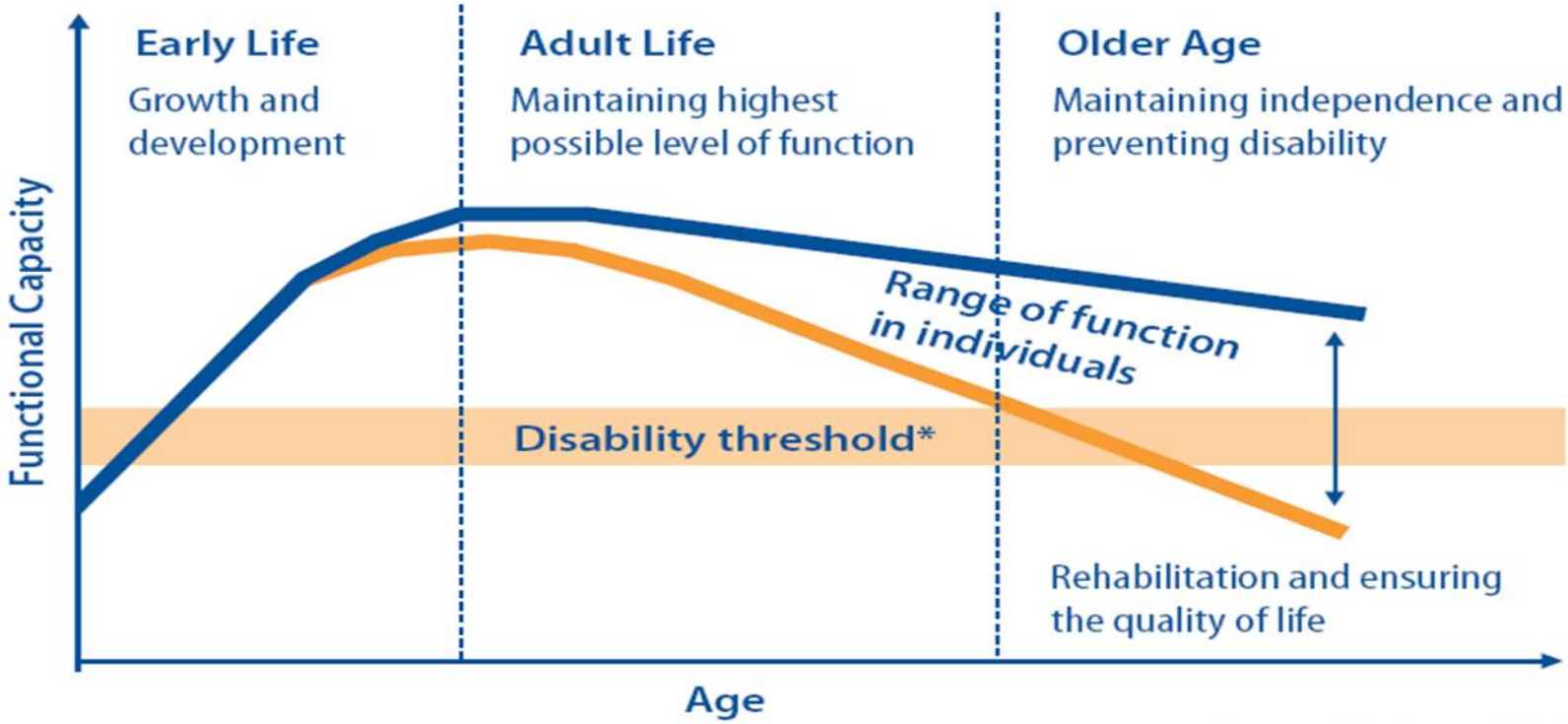
Aerobic Capacity

Flexibility

- Single vs Multiple vs Composite
- Objective (performance-based) vs Subjective (questionnaire)
- Lab vs Field

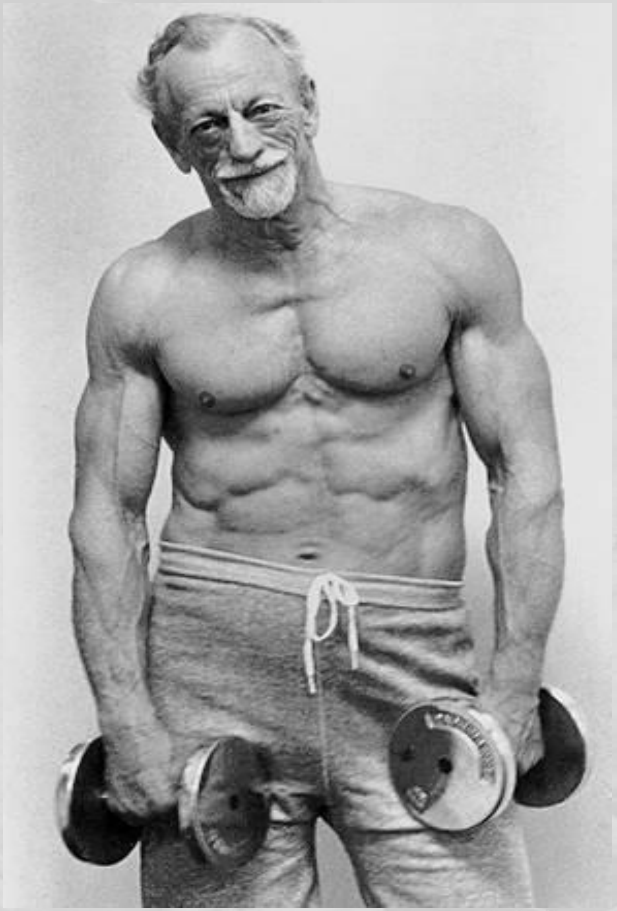
Diversity of Aging

Figure 4. Maintaining functional capacity over the life course



Source: Kalache and Kickbusch, 1997

Functional Levels



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Qualities of Functional Assessments

Validity – Does it measure what it is intended to measure?

Reliability – Are the results able to be replicated accurately?

- **Intra-Rater**
- **Inter-Rater**

Floor Effect – a lower (min) limit for potential scores

Ceiling Effect – a higher (max) limit for potential scores

Keys to High Quality Assessment

Clinician/Practitioner Skill

Proper test selection

Follow protocol to the letter

Remove extraneous influences

Consistency

Safety above all

Functional Assessments

Single Item

- Single-Limb Stance
- Functional Reach
- 20m Walk
- mCTSIB
- Stair Climb
- Figure of 8 Walk Test
- Ramp Power Test
- Dual Tasking

Composite

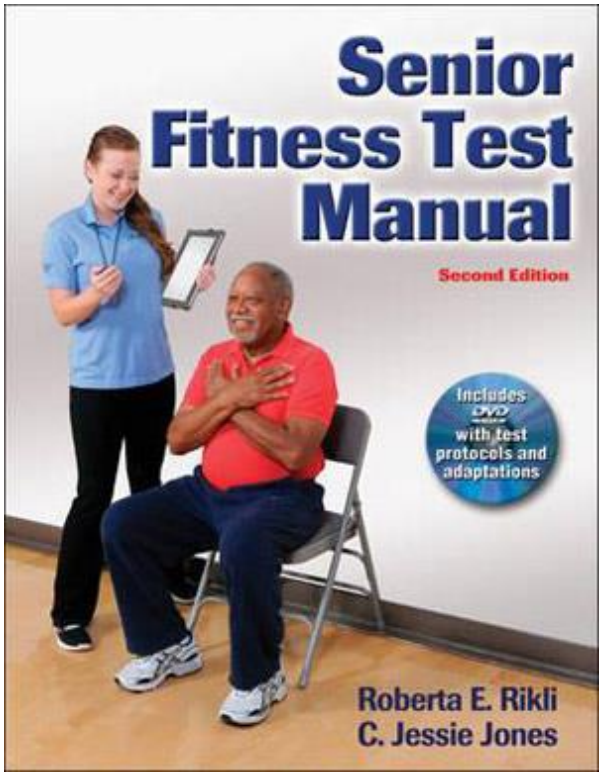
- Continuous Scale Physical Functional Performance Test
- Physical Performance Test
- Short Physical Performance Battery
- Tinetti Performance-Oriented Mobility Assessment
- Berg Balance Scale
- Fullerton Advanced Balance Scale

Screening & Health History

- PARQ is inadequate
- Comprehensive health history interview is highly recommended
  - Current health conditions
  - Current medications
  - Current problems or issues
  - Current activity and exercise
  - Past…all of them
- Informed consent

Senior Fitness Test Battery

- Chair Stand
- Arm Curl
- 8’ Up and Go
- 2-min Step in Place
  - Or 6 min Walk
- Chair Sit and Reach
- Back Scratch



Chair Stand

- Assesses lower-extremity strength under practical (functional) conditions
- Validated against 1RM leg press
- Number of times a person can rise from a chair in 30 seconds

Chair Stand Norms

	Women				Men			
% Rank	60-64	65-69	70-74	75-79	60-64	65-69	70-74	75-79
90	20	18	18	17	22	21	20	20
80	18	16	16	16	20	19	18	18
70	17	15	15	14	19	18	17	16
60	16	14	14	13	17	16	16	15
50	15	14	13	12	16	15	14	14
40	14	13	12	12	15	14	13	13
30	12	12	11	11	14	13	12	12
20	11	11	10	9	13	11	11	10
10	9	9	8	8	11	9	9	8

Chair Stand

Arm Curl

- Assesses upper extremity muscular strength
- Number of times a person can curl a weight in 30 sec while seated in a chair
- 5lb for women; 8lb for men

2-min Step Test

- Alternative is 6 min walk
- Assesses cardiorespiratory endurance
- Validated against maximal VO2 testing
- Number of marches a person can make in two minutes

Back Scratch Test

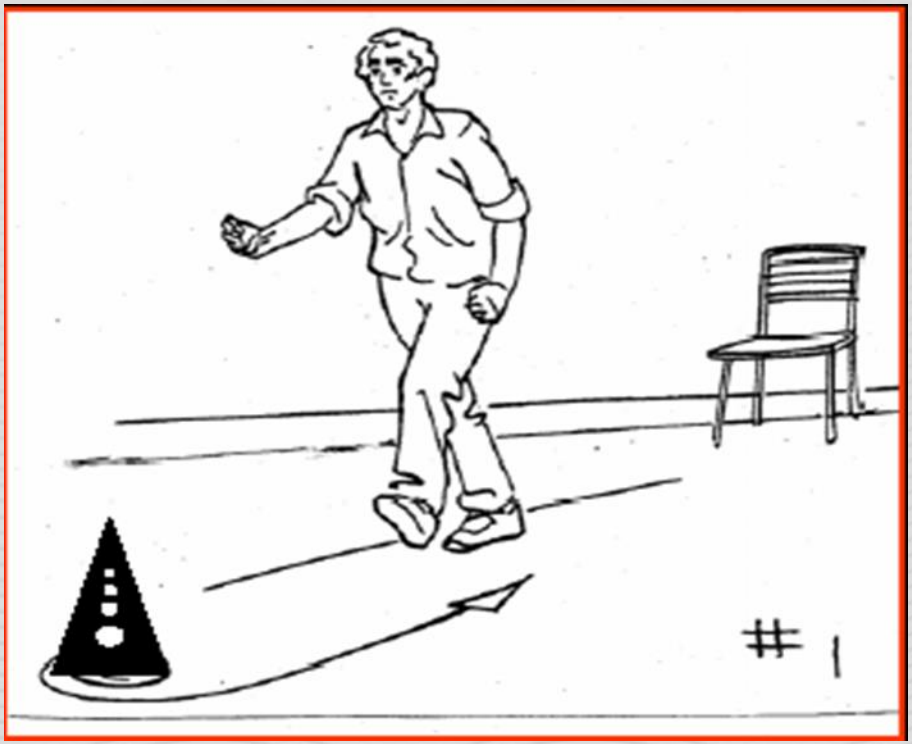
- Assesses upper body flexibility
- Performed in standing
- Preferred/best arm is placed over shoulder behind neck, palm towards body
- Other arm is placed behind back under shoulder blade, palm away from body
- Try to touch/overlap fingers

Chair Sit and Reach Test

- Assesses lower body flexibility
- Seated in chair, towards front edge
- One leg extended, other leg bent
- Arms extended in front, hands overlapping
- Lean/hinge forward towards toe
  - No spinal flexion is allowed

8’ Up and Go

- Assesses agility/dynamic balance
- How long it takes a person to rise from a chair, walk around a cone 8’ away and return to their seat
- Older adults who required greater than 8.5 seconds to complete the UG were classified as fallers.
- Overall prediction rate of classification was 82%.



8’ Up and Go Norms

	Women				Men			
% Rank	60-64	65-69	70-74	75-79	60-64	65-69	70-74	75-79
90	3.7	4.1	4.0	4.3	3.0	3.6	3.6	3.5
80	4.2	4.6	4.7	5.0	3.6	4.1	4.2	4.3
70	4.6	5.0	5.2	5.5	4.0	4.5	4.6	4.9
60	4.9	5.3	5.6	5.9	4.4	4.8	5.0	5.4
50	5.2	5.6	6.0	6.3	4.7	5.1	5.3	5.9
40	5.5	5.9	6.4	6.7	5.0	5.4	5.6	6.4
30	5.8	6.2	6.8	7.1	5.4	5.7	6.0	6.9
20	6.2	6.6	7.3	7.6	5.8	6.1	6.4	7.5
10	6.7	7.1	8.0	8.3	6.4	6.6	7.0	8.3

8’ Up and Go

Fall Prevalence

Table 1. Fatal Fall Rates by Age and Sex, United States, 2001

Age Group	Per 100,000 Population	
	Men	Women
65-69	10.6	5.4
70-74	16.0	9.5
75-79	34.0	19.1
80-84	63.9	41.4
85+	153.2	106.4
Overall, 65+	36.8	30.1
Overall, 65+, adjusted for age	42.0	26.8

Source: National Center for Health Statistics, 2001

2005 NCOA Falls Free: Promoting a National Falls Prevention Action Plan

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Fall consequences

Among adults 70 years and older:

- 3 in 10 fall each year
- 1 in 10 suffer a serious fall injury such as a broken bone or head injury
- Falls cause over 90% of broken hips (only half fully recover; some die)
- Chance of falling increase with health problems (e.g. 4+ = 80% chance of falling)
- A past fall is a significant indicator of a future fall!

Why do people fall?

- First indicator of an acute problem
- Indicate progression of a chronic disease
- Signal of “normal” age-related changes

Multifactorial Geriatric Syndrome

Balance

- One-Legged Stance Test
- Berg Balance Scale
- Fullerton Advanced Balance Scale
- MCTSIB

One-Legged Stance Test

Instructions:
Have clients stand on preferred leg without support of the upper extremities or bracing of the unweighted leg against the stance leg.

Clients begin the test with the eyes open, practicing once or twice on each side with gaze fixed straight ahead.

Instruct the client to close their eyes and maintain balance for up to 30 seconds.

Termination:
The test ends when: 1) the foot touches the stance leg; 2) hopping occurs; 3) the foot touches the floor; 4) the arms touch something for support; 5) 30 seconds is reached.

Critical Time is 5 seconds

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Berg Balance Scale

Description: 14-item scale designed to measure balance of the older adult in a clinical setting.

Equipment needed: Ruler, 2 standard chairs (one with arm rests, one without), footstool or step, stopwatch or wristwatch, 15 ft walkway

Time: 15-20 minutes
Scoring: Scale from 0-4. “0” indicates the lowest level of function and “4” the highest level of function. Total Score = 56

Interpretation: 41-56 = low fall risk
21-40 = medium fall risk
0 –20 = high fall risk

Criterion Validity:
“Authors support a cut off score of 45/56 for independent safe ambulation”

Berg Balance Scale Items

TURN 360 DEGREES
INSTRUCTIONS: Turn completely around in a full circle. Pause. Then turn a full circle in the other direction.

( ) 4 able to turn 360 degrees safely in 4 seconds or less
( ) 3 able to turn 360 degrees safely one side only 4 seconds or less
( ) 2 able to turn 360 degrees safely but slowly
( ) 1 needs close supervision or verbal cuing
( ) 0 needs assistance while turning

PLACE ALTERNATE FOOT ON STEP OR STOOL WHILE STANDING UNSUPPORTED
INSTRUCTIONS: Place each foot alternately on the step/stool. Continue until each foot has touch the step/stool four times.

( ) 4 able to stand independently and safely and complete 8 steps in 20 seconds
( ) 3 able to stand independently and complete 8 steps in > 20 seconds
( ) 2 able to complete 4 steps without aid with supervision
( ) 1 able to complete > 2 steps needs minimal assist
( ) 0 needs assistance to keep from falling/unable to try

Berg Balance Scale Items

STANDING UNSUPPORTED ONE FOOT IN FRONT
INSTRUCTIONS: (DEMONSTRATE TO SUBJECT) Place one foot directly in front of the other. If you feel that you cannot place your foot directly in front, try to step far enough ahead that the heel of your forward foot is ahead of the toes of the other foot. (To score 3 points, the length of the step should exceed the length of the other foot and the width of the stance should approximate the subject's normal stride width.)

( ) 4 able to place foot tandem independently and hold 30 seconds
( ) 3 able to place foot ahead independently and hold 30 seconds
( ) 2 able to take small step independently and hold 30 seconds
( ) 1 needs help to step but can hold 15 seconds
( ) 0 loses balance while stepping or standing

STANDING ON ONE LEG
INSTRUCTIONS: Stand on one leg as long as you can without holding on.

( ) 4 able to lift leg independently and hold > 10 seconds
( ) 3 able to lift leg independently and hold 5-10 seconds
( ) 2 able to lift leg independently and hold ≥ 3 seconds
( ) 1 tries to lift leg unable to hold 3 seconds but remains standing independently.
( ) 0 unable to try of needs assist to prevent fall

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MCTSIB

Modified Clinical Test of Sensory Interaction in Balance

Test in Four Conditions for 30 seconds:

- Eyes Open Stable EOS
- Eyes Closed Stable ECS
- Eyes Open Unstable EOU
- Eyes Closed Unstable ECU

Cross arms over chest, Stand erect, Shoulder-width stance

Unstable Surface = 2 high density foam pads

Limitation: Cannot identify a deficit in one specific system

mCTSIB

The Aging Opportunity

- Traditionalist or silent generation (seniors)
- 28 million
- Baby Boomers
- 76 million
- Gen Xers (already turning 50)
- 64 million

FAI Programs

CEC's – ACE, AFAA, NFPT, ACSM, NASM, AFN

Completely online

- 13 educational modules
- 5 hours of video
- 90 question test
- Coupon: FitnessFest

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