

Falls Risk Assessment in Older People



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Institute**

Assessing falls risk

- unrealistic expectations?

- **The causes of falls are multifactorial in nature**
- **There is a desire for a single test or quick assessment of falls risk**

Screening or assessment?

Screening – identification of people at risk

- **Increased surveillance**
- **Referral for further assessment and intervention**

Assessment - identification of risk factors amenable to treatments / correction

- **Tailoring intervention strategies**

Simplest screen

- **Have you fallen in the past 12 months?**
 - **Degree of difficulty – easy**
 - **Sensitivity and specificity – reasonable**
 - **Information gained about prevention strategies – nil**

Hospitals: STRATIFY (Oliver 1997)

- **Items**
 - falls as a presenting complaint
 - agitation
 - frequent toileting
 - visual impairment
 - transfer and mobility score
- Sensitivity 93% and specificity of 88% in development hospital
- Sensitivity 92% and specificity 68% in different hospital

Timed Up and Go Test

- Recommended by American and British Geriatrics Societies
- Surprisingly little validation as a predictor of falls
- Varying methods
 - Usual vs. fast performance
 - Differing walk distances: 3m vs. 8ft
 - Differing instructions about turning: walk to line, walk past line, walk around a cone
- Varying cut-points: 10s, 14s, 15s, 22s

Timed Up and Go Test - recommendations

- Most widely used method
 - Perform at usual (own) pace
 - Chair with seat height of 43cm with armrests
 - Walk distance of 3m
 - Walk past line and turn
- Cut-points
 - 10s for community-dwelling people
 - 15s for frail groups

Assessment batteries

- Berg Balance Scale
<http://www.physicaltherapy.utoronto.ca/assetfactory.aspx?did=126>
- Tinetti Performance Oriented Mobility Assessment (POMA)
- Physical Performance battery (Guralnik et al) -
<http://www.coe.uqa.edu/cs-pfp/pdfs/ppt.pdf>
- Elderly Fall Screening Test
- Gait Abnormality Rating Scale

Guralnik Physical performance battery

- Has been used in very large studies, and normative values have been established
- Comprises
 - timed standing balance
 - repeated chair stands
 - timed walk
- Each item scored /4 with combined score / 12

Guralnik Physical performance battery

SCORING:

A. SIDE-BY-SIDE STAND

Held for 10 seconds .. _ **1 point**
Not held for 10 seconds .. _ **0 points**
Not attempted _ **0 points**
If 0 points, end Stands Test

Number of seconds held if
less than 10 seconds __. __ seconds

IF NOT ATTEMPTED, CIRCLE ANSWER:

Tried but unable1
Participant could not stand unassisted. 2
Not attempted, you felt unsafe 3
Not attempted, participant felt unsafe...4
Participant unable to understand
instructions ..5
Other (SPECIFY) _____6
Participant refused ...7

B. SEMI-TANDEM STAND

Held for 10 seconds . _ **1 point**
Not held for 10 seconds.. .. _ **0 points**
Not attempted ... _ **0 points**
If 0 points, end Stands Test

Number of seconds held if less than 10 seconds . __. __ seconds

C. TANDEM STAND

Held for 10 seconds _ **2 points**
Held for 3 to 9 seconds .. . _ **1 point**
Not held for at least 3 seconds ... _ **0 points**
Not attempted . _ **0 points**

Number of seconds held if less than 10 seconds . __. __ seconds

D. TOTAL STANDS SCORE _____ (sum points)

Comments: _____

Comparison of 8 function tests

- Sit-to-stand 1x & 5x
- Alternate step test (19cm high step)
- Turn test (n steps to turn 180 degrees)
- 6m walk – normal speed
- Pick-up 5kg weight test
- Stair ascent (8 steps - 5cm high, 27cm deep)
- Stair descent (8 steps - 5cm high, 27cm deep)

- 362 community-dwelling people aged 75+

- Compared w.r.t. validity, reliability and feasibility

Sit-to-stand test an Alternate Step Tests



Functional tests - recommendations

Test	Validity	Reliability	Feasibility	Total
STS- 5	10	5	5	20
Alt step	10	4	4	18
6m walk	10	4	3	17
Stair des	10	5	0	15
Stair asc	5	5	0	10
Turn	0	4	5	9
STS – 1	0	2	5	7
Pick-up	0	1	4	5

Need for multiple tests for falls prediction

- Poor performances in two tests did increase risk
- Poor performances in 3+ tests did not increase risk further

Impairments	Odds Ratio
0	1
1	1.9
2	4.7
3	5.0
4	4.7

QuickScreen Assessment Form

PRINCE OF WALES MEDICAL RESEARCH INSTITUTE

QuickScreen® Clinical Falls Risk Assessment

Patient: _____ Date: _____

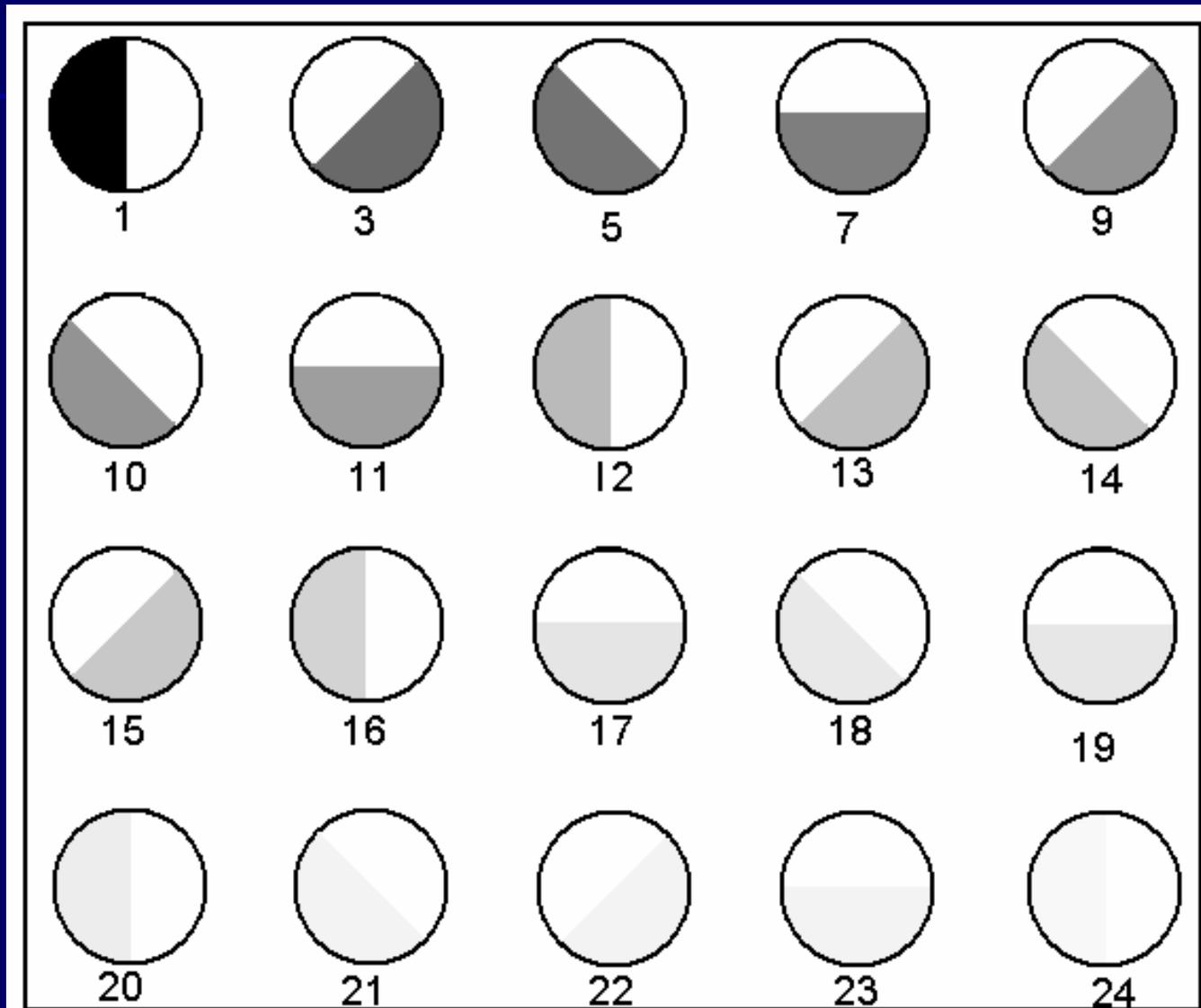
MEASURE	RISK FACTOR PRESENT? (please circle)	ACTION															
Previous Falls																	
One/more in previous year	Yes/No																
Medications																	
Four or more (excluding vitamins)	Yes/No																
Any psychotropic	Yes/No																
Recommendation: Review current medications																	
Vision																	
Low contrast visual acuity test	Yes/No																
Unable to see all of line 10	Yes/No																
Recommendation: Give vision information sheet. Examine for glaucoma, cataracts and suitability of spectacles. Refer if necessary.																	
Peripheral Sensation																	
Tactile sensitivity test	Yes/No																
Unable to feel 2 out of 3 trials	Yes/No																
Recommendation: Give sensation loss information sheet. Check for diabetes.																	
Strength/ Reaction Time/ Balance																	
Neartandem stand test	Yes/No																
Unable to stand for 10 secs	Yes/No																
Alternate step test	Yes/No																
Unable to complete in 10 secs	Yes/No																
Sit to stand test	Yes/No																
Unable to complete in 12 secs	Yes/No																
Recommendation: Give strength/balance information sheet. Refer to community exercise class or home exercise program if appropriate to individual level of functioning.																	
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Number of risk factors</th> <th style="width: 10%;">0-1</th> <th style="width: 10%;">2-3</th> <th style="width: 10%;">4</th> <th style="width: 10%;">5</th> <th style="width: 10%;">6 +</th> </tr> </thead> <tbody> <tr> <td>Total risk increase</td> <td>1</td> <td>2.2</td> <td>3.7</td> <td>4.8</td> <td>10.1</td> </tr> </tbody> </table>						Number of risk factors	0-1	2-3	4	5	6 +	Total risk increase	1	2.2	3.7	4.8	10.1
Number of risk factors	0-1	2-3	4	5	6 +												
Total risk increase	1	2.2	3.7	4.8	10.1												
Total Risk Increase: The patient has _____ times the risk of falling as someone with no risk factors																	

Full Screen

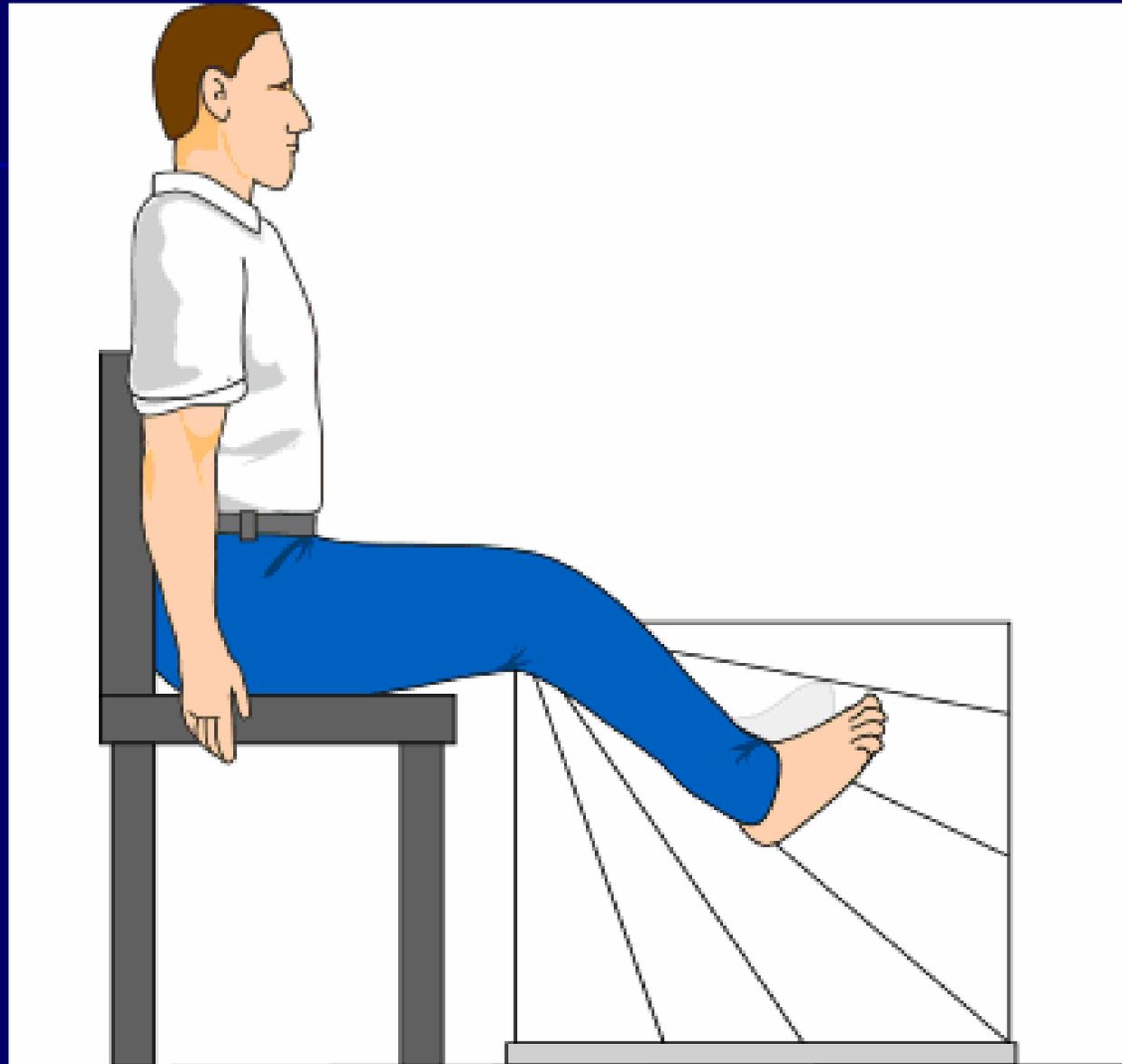
Fall Risk Assessment - PPA

- Physiological, rather than disease-oriented
- Involves quantitative functional assessment of sensorimotor abilities
- Assumes that most disease processes will be manifest in impaired performances in one or more tests
 - Cataracts – poor vision
 - Neuropathy – poor sensation
 - Prior-polio – weakness
 - Stroke – weakness, incoordination, instability

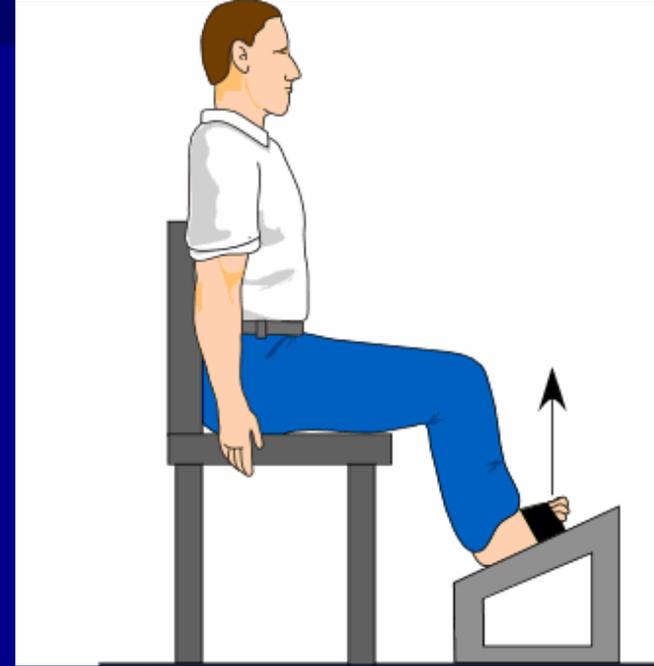
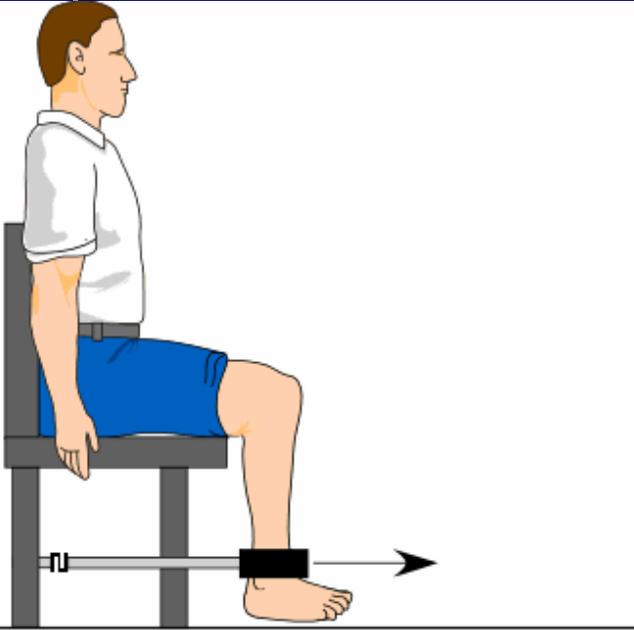
Contrast sensitivity - MET



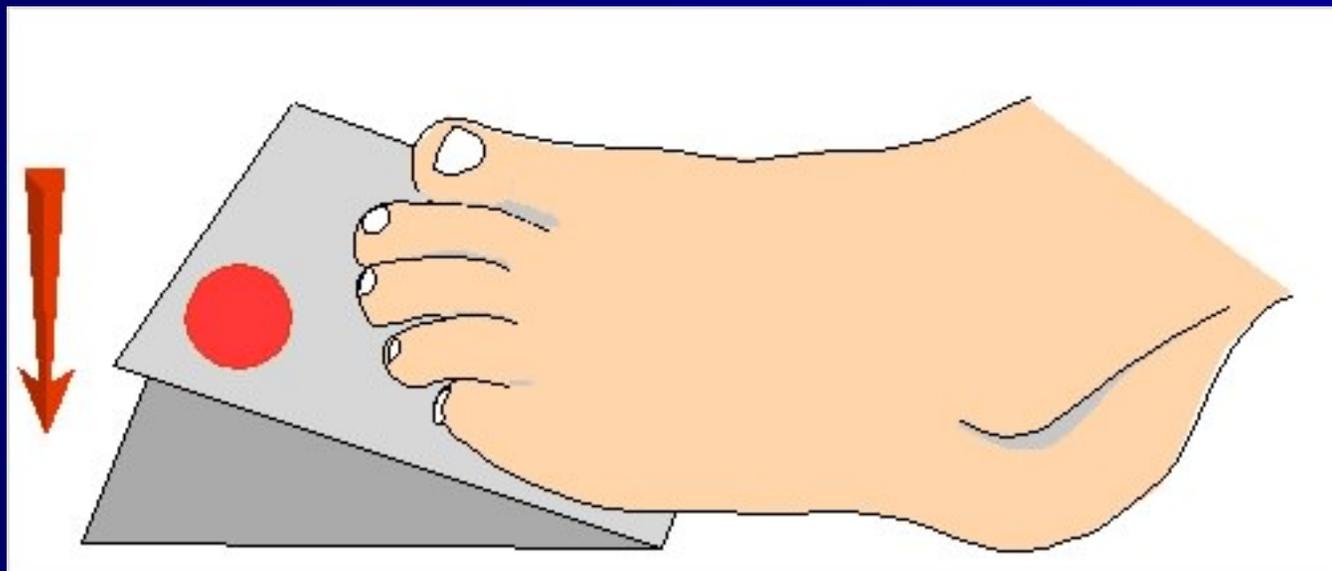
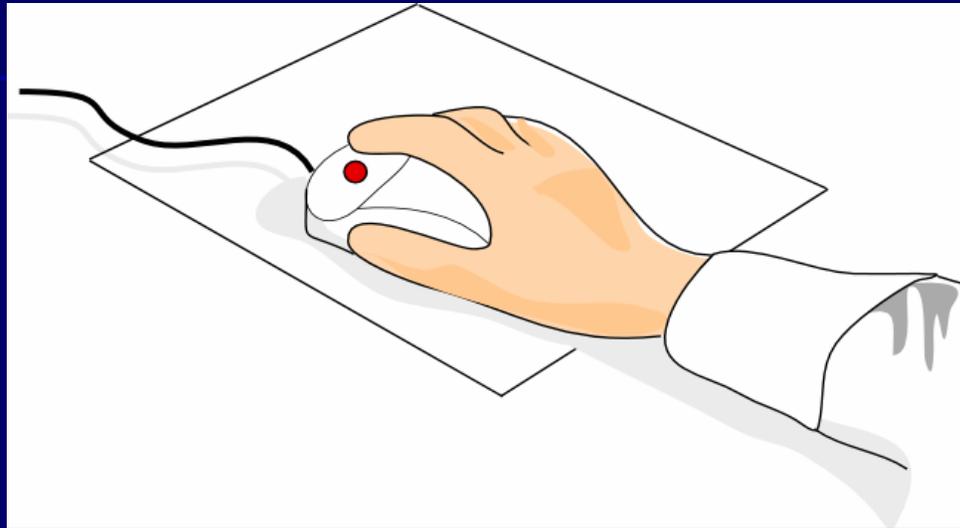
Proprioception



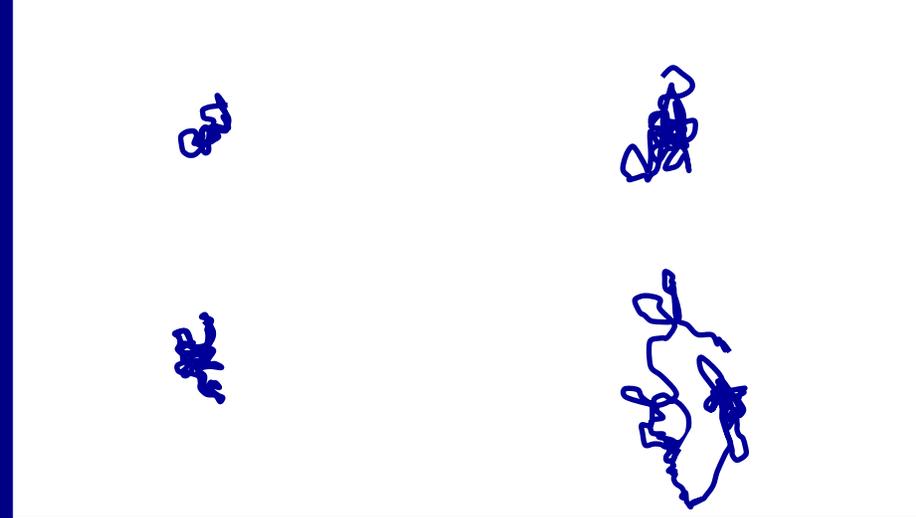
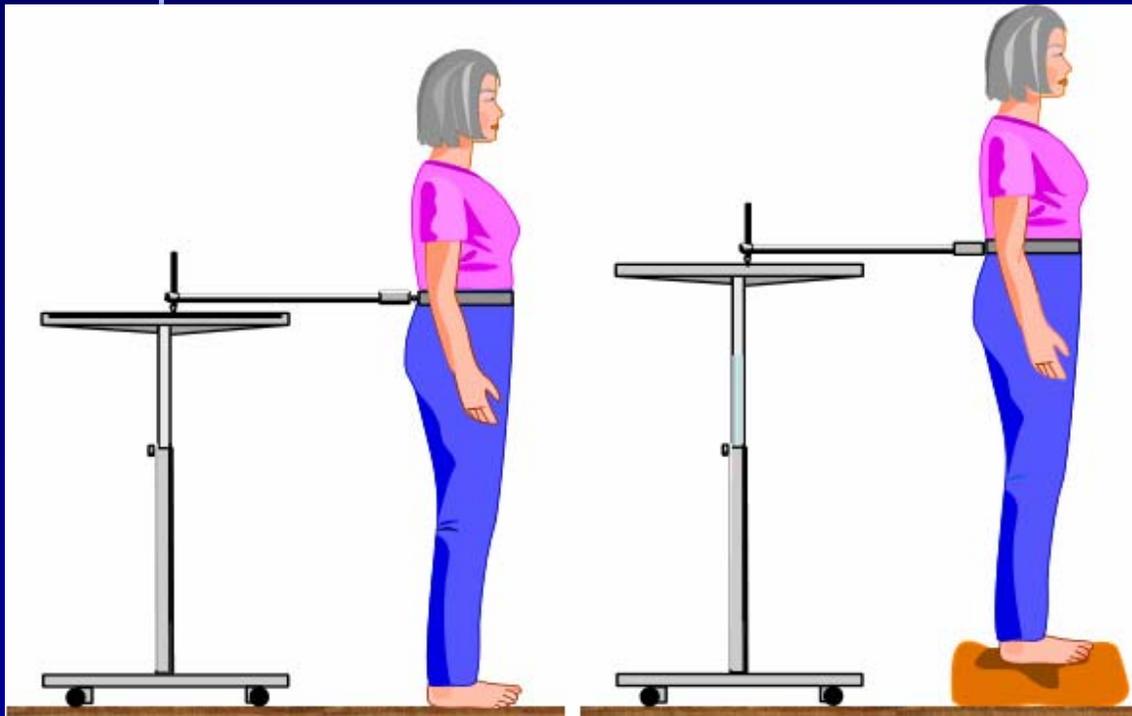
Lower Limb Strength



Reaction Time- Hand & Foot



Sway on floor and on foam



PPA Short form

- **Significant and independent predictors**
Coefficients
 - Visual contrast sensitivity -0.33
 - Proprioception 0.20
 - Quadriceps strength -0.16
 - Simple reaction time 0.47
 - Postural sway on the compliant surface 0.51
- Percentage of subjects correctly classified: 75%.



FallScreen

PHYSIOLOGICAL FALLS ASSESSMENT

Name: Mrs Mary Quitecontrary

Age: 70

Assessment date: 1/ 3/ 2006

Assessment Number: 1

TEST RESULTS

Measure	Score	Young normal	Age-matched~
Vision			
Edge contrast sensitivity (dB)	5**	(23 - 24)	(20 - 24)
Sensation			
Proprioception - legs (degrees)	1.8	(0.2 - 1.4)	(0.4 - 2.4)
Strength			
Knee extension strength (kg)	19	(35 - 58)	(15 - 29)
Speed and Control			
Reaction time - hand (ms)	250	(182 - 236)	(197 - 267)
Balance			
Sway on foam - eyes open (mm)	54.07#	(60-110)	(65 - 163)

~ Women aged 70-74 years.

Better than average age-match (i.e. top 10%).

** Worse than average age-matched.

Notes:

1. Low scores in proprioception, reaction time and sway tests and high scores in edge contrast sensitivity and strength indicate good performances.
2. Population norms from the Randwick Falls and Fractures Study.



FallScreen Assessment

Falls Risk Test Scores

The blue bars show performance in each test in relation to norms for persons aged 60 years and over. Scores above zero show above average performances and scores below zero show below average performances. Scores below -1 indicate significant impairments.

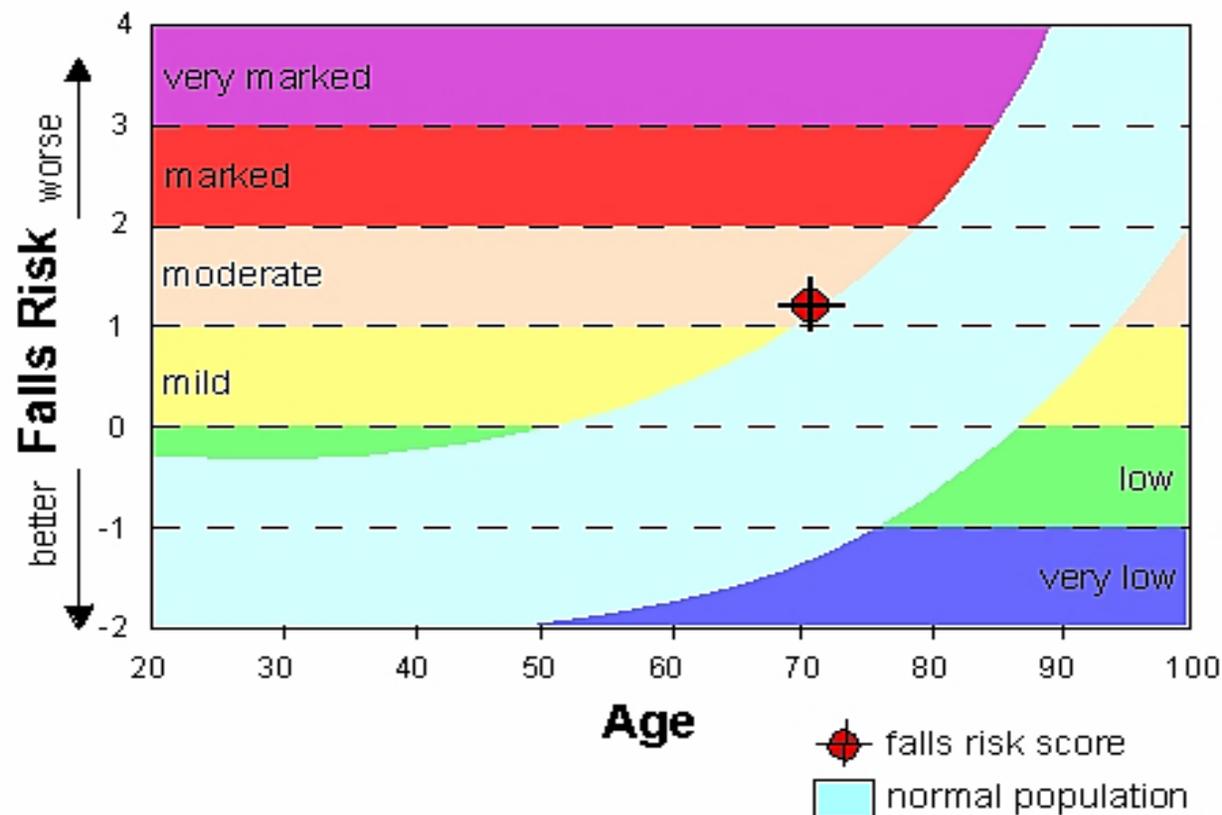
Report for: Mrs Mary Quitecontrary
Assessment date: 1 /3 /2006
Assessment number: 1
Falls risk score: 2.7

Test	Z-score	-3	-2	-1	0	1	2	3
Edge Contrast sensitivity	-2.37							
Proprioception	-0.29							
Knee extension strength	-0.14							
Reaction time - hand	-0.12							
Sway on foam eyes open	-0.78							

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Log Off

Falls Prevention Assessment Report



Report for: Mary Quitecontrary
Assessment date: 1 3 2006
Assessment Number: 1
Falls risk score: 1.2

The Falls Risk Score is indicated by the cross. The lower the score the better. The light curved band shows the normal range across age-groups.

Your score of **1.2** indicates a **moderate** risk of falling.



Falls and Balance Research Group Prince of Wales Medical Research Institute

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1. 3. 2006

High St
Randwick NSW 2031

Dear Mrs Mary Quitecontrary,

Please find attached the report regarding your balance assessment at Prince of Wales Medical Research Institute on 1/ 3/ 2006. These test results indicate that you have an increased risk of falling.

You performed well in the important test/s of sway on foam - eyes open . In some areas however, you were below average for your age group, so the following recommendations may be of help to you.

Your vision test was below average. Reduced vision can increase the risk of a trip over an unseen object in the environment such as steps, gutters and footpath cracks and raised edges. It is recommended that you should see an eye specialist for an assessment if you have not done so in the past year. You may also benefit by wearing a single lens pair of glasses, especially when outside. It is recommended that you do not wear bifocal or multifocal spectacles, as the lower sections of these spectacles blur items at critical distances on the ground and this can lead to trips. Wearing a hat when outside also improves vision by reducing glare substantially.

For enquiries regarding this report, please contact the Falls Risk Assessment Program at Prince of Wales Medical Research Institute on 9399 1000.

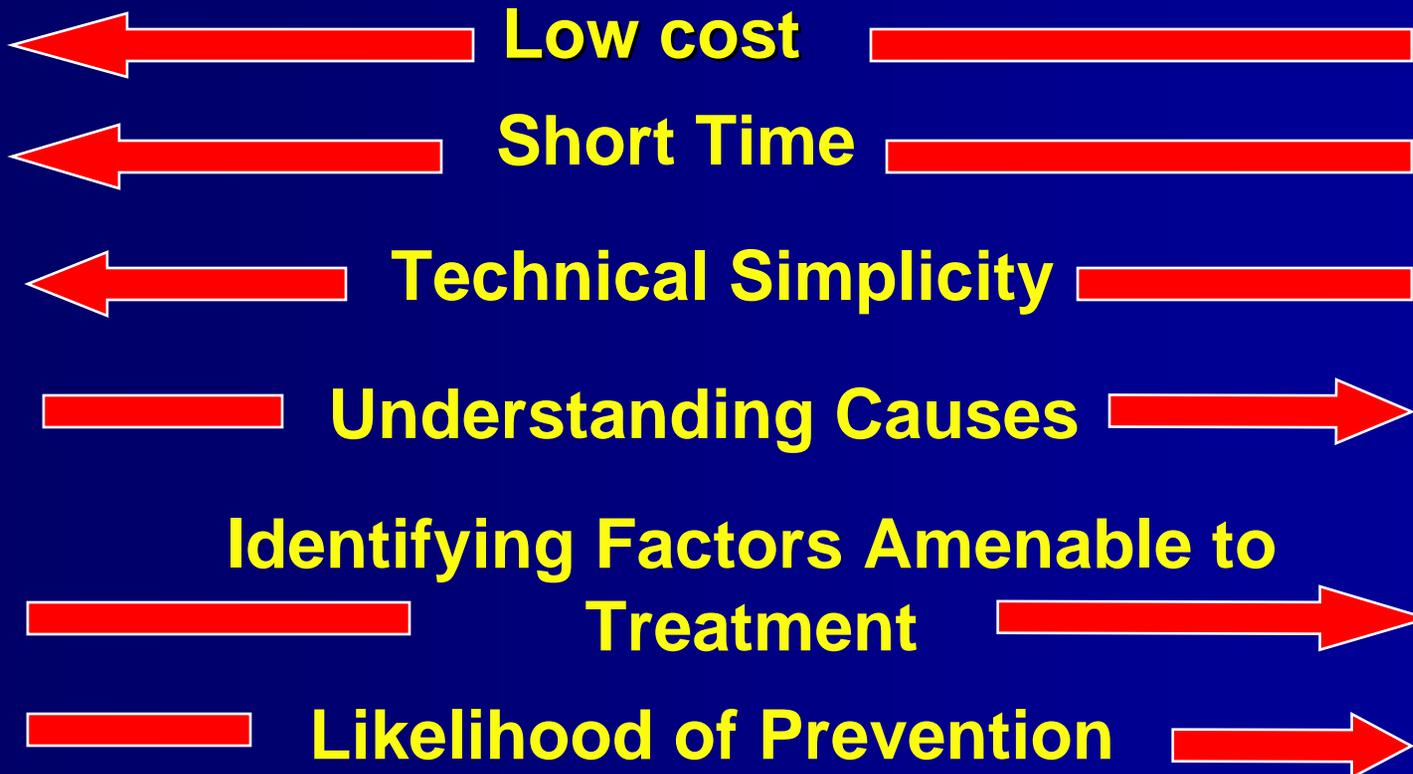
Yours sincerely,

Dr Fixit

Falls Screening and Assessment Trade-offs

SIMPLE

COMPREHENSIVE



Conclusions

- **Epidemiological studies have identified demographic, physiological and medical risk factors for falls**
- **This information can be used to compile evidence-based fall risk screens and assessments**
- **The screen or assessment used depends on the resources available and the extent to which the understanding of the causes of falls is required**