FUNCTIONAL INDEPENDENCE MEASURE AND FUNCTIONAL ASSESSMENT MEASURE

Functional Independence Measure

The Functional Independence Measure (FIM) scale assesses physical and cognitive disability.[1] This scale focuses on the burden of care – that is, the level of disability indicating the burden of caring for them.

Scoring

Items are scored on the level of assistance required for an individual to perform activities of daily living. The scale includes 18 items, of which 13 items are physical domains based on the Barthel Index and 5 items are cognition items. Each item is scored from 1 to 7 based on level of independence, where 1 represents total dependence and 7 indicates complete independence. The scale can be administered by a physician, nurse, therapist or layperson. Possible scores range from 18 to 126, with higher scores indicating more independence. Alternatively, 13 physical items could be scored separately from 5 cognitive items.

Time

It takes 1 hour to train a rater to use the FIM scale, and 30 minutes to score the scale for each patient.

Clinical application

The FIM scale is used to measure the patient's progress and assess rehabilitation outcomes. This scale is useful in clinical settings of rehabilitation. The FIM was carefully designed and developed with the consensus of the US National Advisory Committee, with close attention to definitions, administration and reliability. Manuals, training and videos are provided (further information can be found at www.udsmr.org). The FIM has been used in a number of countries, including the USA, Canada, Australia, France, Japan, Sweden and Germany. Studies of large samples have been published, including a study of 93 829 subjects.[2] The FIM has been used extensively in rehabilitation, including that for stroke and multiple sclerosis. Scores are responsive to change and also reflect the patient's discharge destination.
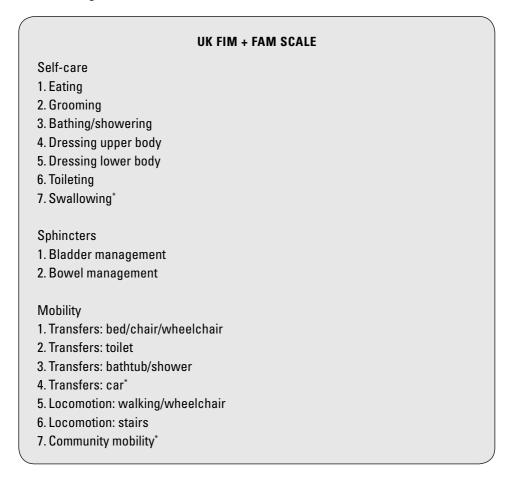
FIM and FAM

The Functional Assessment Measure (FAM) includes FIM items but also adds 12 new items, mainly covering cognition, such as community integration, emotional

status, orientation, attention, reading and writing skills, and employability.[3] The FIM scale on its own had ceiling effects, so the FAM was proposed, which extends the coverage of the FIM. This scale was originally intended for patients with brain injury, but is in fact useful in all rehabilitation settings.

FIM + FAM is completed by a healthcare professional for the patient.

UK FIM + FAM

This scale was developed in the UK, and was last modified by the UK FIM+FAM Group in 1999.[4] Some of the items used in the original FAM from the US Developmental Group in California were considered to be too vague. For this reason the UK version was developed after modification of the original FAM. The UK FIM + FAM Group was coordinated by the Regional Rehabilitation Unit at Northwick Park Hospital, Middlesex, UK.[4] This group has improved the consistency of scoring. The original 30 items and 7 levels remain the same as in the original version.

UK FIM + FAM SCALE

Self-care
1. Eating
2. Grooming
3. Bathing/showering
4. Dressing upper body
5. Dressing lower body
6. Toileting
7. Swallowing*

Sphincters
1. Bladder management
2. Bowel management

Mobility
1. Transfers: bed/chair/wheelchair
2. Transfers: toilet
3. Transfers: bathtub/shower
4. Transfers: car*
5. Locomotion: walking/wheelchair
6. Locomotion: stairs
7. Community mobility*

Communication
1. Expression
2. Comprehension
3. Reading*
4. Writing*
5. Speech intelligibility*

Psychosocial
6. Social interaction
7. Emotional status*
8. Adjustment to limitations*
9. Use of leisure time (replaces employability in original version)*

Cognition
10. Problem solving
11. Memory
12. Orientation*
13. Concentration (replaces attention in original version)*
14. Safety awareness (replaces safety judgement in original version)*

*FAM items

Seven levels for each item

Level		Description
7	Complete independence	Fully independent
6	Modified independence	Requiring the use of a device but no physical help
5	Supervision	Requiring only standby assistance or verbal prompting or help with set-up
4	Minimal assistance	Requiring incidental hands-on help only (subject performs > 75% of the task)
3	Moderate assistance	Subject still performs 50–75% of the task
2	Maximal assistance	Subject provides less than half of the effort (25–49%)
1	Total assistance	Subject contributes < 25% of the effort or is unable to do the task

Scoring principles

- Function is assessed on the basis of direct observation.
- Admission scoring is done within 10 days of admission.
- Discharge scoring is done during the last week before discharge.
- Scoring is done by a multi-disciplinary team member.
- The subject is scored on what they *actually do* on a day-to-day basis, not on what they *could do.*
- Do not leave any score blank.
- Score 1 if the subject does not perform the activity at all, or if no information is available.
- If function is variable, use the lower score.

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FALLS RISK ASSESSMENT TOOLS

Falls in the elderly represent a complex phenomenon and are rarely due to a single cause. A variety of factors are associated with risk of falling among older adults, including the following:

◗ physical factors such as history of previous falls, poor gait or balance, muscle weakness, functional limitation, poor vision, arthritis, postural hypotension, sensory deterioration and neurological disorders
◗ pharmaceutical factors – use of medications
◗ psychiatric factors – cognitive impairment
◗ environmental factors.
   Assessment of falls risk may include the following:
◗ use of multi-factorial assessment tools that cover a range of falls risk factors. This could enable screening of high-risk populations and targeting of interventions
◗ functional mobility assessments that focus on postural stability, including strength, balance, gait and reaction times.

Effective assessment of fall risk requires a holistic approach, and includes review of many complex and interconnected factors. Falls could be the result of one or more complex and interrelated physiological systems impairments as well as environmental factors. The falls risk increases rapidly with advancing age above 65 years. It is difficult to determine what factors affect balance and contribute to falls, and which factors could be addressed to reduce falls.

Choice of tool

This is difficult. A variety of tools have been assessed and evaluated for their use in predicting falls risk. Different tools have been used in a variety of settings – for example, in the community, at home, and in long-term or acute care.[1] Some of them have focused on balance and gait assessments, while others have focused on risk factors. Target populations within a given setting have varied in studies – for example, those with cognitive impairment, and studies limited to small samples or recurrent fallers. Few tools have been tested more than once in more than one setting. Therefore no single falls risk assessment tool can be recommended for implementation in all settings.

   The choice of tool in a particular clinical context should reflect the purpose for which that tool needs to be applied. For example, the screening of a high-risk population requires a tool that is quick and easy to use, with good sensitivity and specificity. If the aim is to reduce risk, the tool should be reliably able to

identify remedial risk factors which would allow for tailoring of interventions. Comprehensive medical assessment of fallers is the focus of the Prevention of Falls Network Europe Group (profane.org.eu).

A systematic review of risk assessment tools for falls in hospitalised patients was published in 2004.[2] The authors concluded that few well-validated tools have been described, and that even the best-validated tool could fail to predict a significant number of falls, as fallers are a heterogenous group.[2] However, a small number of readily detectable risk factors have been repeatedly identified in studies. Perhaps the key is to look for reversible falls risk factors in all patients.[2]

Currently the use of falls risk assessment as part of a multi-factorial approach to the prevention of falls is supported by evidence of a strong association between multiple risk factors and falls, and a significant reduction in falls can be achieved where assessment is combined with tailored interventions.[3]

Some of the tools for assessing risk of falling are described below.

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THE STRATIFY FALLS RISK ASSESSMENT TOOL

This tool was developed and validated in the UK to predict falls.[1]

Scoring

The tool contains five clinical risk factors associated with falling, and has a simple scoring system. These factors can be readily assessed by ward nurses based upon their day-to-day observation of patients admitted to hospital. A score range of 0 to 5 is derived by scoring 1 point for each of the five factors. The scoring requires no formal measurements, additional training or equipment.

Time taken

It takes 1 minute to administer this tool.

Sensitivity and specificity

The ability of the STRATIFY tool to predict falls had 93% sensitivity and 88% specificity amongst the phase 2 population cohort and 92% sensitivity and 68% specificity amongst the phase 3 cohort population studied.[1] The authors found that this tool has high predictive validity. The tool shows reproducibility with the predictive variables tested in different geriatric settings.

Clinical application

A score of 2 as a definition of high risk identified 93% of falls.[1] This can allow targeting of strategies to prevent falls of patients on the ward. Thus the STRATIFY falls risk assessment tool may be applicable to many acute elderly patients in hospital.

Limitations

Falls rather than patients were used as outcomes in the STRATIFY study, and this could inflate the predictive validity. Certain patient characteristics may have greater value in predicting falls. The term 'agitation' could have varying interpretations. A prospective cohort study showed that the STRATIFY tool performed poorly as a predictor of falls in stroke patients.[2]

A STRATIFY tool with some modifications and re-weighting of items has been used and developed in a Canadian hospital setting, where it showed good predictive validity in identifying fallers.[3]

STRATIFY FALLS RISK ASSESSMENT TOOL

Person's name: . . . .

Date of assessment: . . . .

Choose **one** of the following options which best describes the person's level of capability when transferring from a bed to chair:

Answer	Score
Unable	0
Needs major help	1
Needs minor help	2
Independent	3

Choose **one** of the following options which best describes the person's level of mobility:

Answer	Score
Immobile	0
Independent with the aid of a wheelchair	1
Uses walking aid	2
Walks with the aid of one person	2
Independent	3

Total the transfer and mobility score: _____

		Answer	Score
1	Is the combined transfer and mobility score 3 or 4?	*Answer*	*Score*
		Yes	1
		No	0
2	Has the person had any falls in the last 3 months?	*Answer*	*Score*
		Yes	1
		No	0
3	Is the person visually impaired to the extent that everyday function is affected?	*Answer*	*Score*
		Yes	1
		No	0
4	Is the person agitated?	*Answer*	*Score*
		Yes	1
		No	0

5 Do you think the person is in need of especially frequent toileting?	*Answer*	*Score*
	Yes	1
	No	0

Total of questions 1–5   _____

0 = low risk   1 = moderate risk   2 or above = high risk

Developed from Oliver D *et al.* Development and evaluation of evidence-based risk assessment tool (STRATIFY) to predict which elderly inpatients will fall. *BMJ.* 1997; **315:** 1049–53. Reproduced with permission from BMJ Publishing Group.

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BALANCE TESTS IN OLDER ADULTS

Maintaining balance requires the interaction of skeletal, neuromuscular and sensory systems. A variety of balance tests have been developed for use at home or in hospital. These can assist older adults who are at risk of falling. Among the many tools that have been published, a review[1] identified the following six balance testing tools as most appropriate for clinical use, as they do not require much equipment or training, they can be administered quickly and they can be applied at home or in clinic:

1 the Berg Balance Scale
2 the Clinical Test of Sensory Interaction and Balance
3 the Functional Reach Test
4 the Tinetti Balance Test
5 the Timed Up and Go Test
6 the Physical Performance Test.

The choice of tool depends upon what aspect of balance is to be measured and what the results will be used for. All of the above tools measure balance during voluntary, self-initiated dynamic movements which are involved in the performance of daily activities. The Tinetti Balance Test and the Timed Up and Go Test also measure balance during gait. The Clinical Test of Sensory Interaction and Balance, the Functional Reach Test and the Timed Up and Go Test measure more narrow aspects of balance. The Functional Reach Test and the Timed Up and Go Test are more sensitive to change over time. The Berg Balance Scale and the Functional Reach Test have more evidence for reliability and validity.[1]

For prediction of falls, only the Berg Balance Scale, the Functional Reach Test and the Tinetti Balance Test have actual cut-off scores which are predictive of falls. Therefore these three tools could be useful when setting objective goals for individual patients. However, as balance requires the interaction of many different systems, use of one tool alone may not predict falls. Even then, among the multiple risk factors, altered balance is the greatest contributor towards falls in the elderly.

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BERG BALANCE SCALE

This is one of the most widely used tests of functional mobility and balance. It was specifically designed as a measure of balance for use with older people in clinical settings.[1] It is intended to assess a person's ability to perform several common daily living tasks safely. It assesses ability to maintain positions or perform movements of increasing difficulty, progressing from a sitting position to bilateral stance and then to tandem and single leg stance. The ability to change positions is also assessed.

Scoring

This balance scale[1] is based on 14 items that are common to daily life activities. The items include both simple mobility tasks (transfers, standing unsupported, sit to stand) and more difficult tasks (tandem standing, turning through 360 degrees, single leg stance). The items are graded on a 5-point ordinal scale from 0 to 4, with a maximum possible score of 56 points. A score of 0 is given if the participant is unable to perform the task, and a score of 4 is given if they are able to do the task.

Instructions

◗ Please document each task and/or give instructions as written.
◗ When scoring, record the *lowest* response category that applies for each item.
◗ For most items, subjects are asked to maintain a given position for a specific length of time.
◗ Progressively more points are deducted if:
  ● the time or distance requirements are not met
  ● the subject's performance warrants supervision
  ● the subject touches an external support or receives assistance from the examiner.
◗ The subject should understand that they must maintain their balance while attempting the tasks.
◗ The choice of which leg to stand on or how far to reach is left to the subject.
◗ Chairs that are used should be of reasonable height.
◗ Either a stool or a step of average step height should be used for item 12.

Berg Balance Scale score	Falls risk
41–56	Low
21–40	Medium
0–20	High

Assistive devices cannot be used. However, personal assistance is permitted during the test and is incorporated into the scoring system.

Administration time

It takes around 15 minutes to administer this tool.

Tools

A stopwatch, ruler, chair, bed and stool are needed.

Reliability

The psychometric properties of this tool have been extensively tested. The tool has demonstrated adequate inter–rater (Intraclass Correlation Coefficient (ICC) = 0.98) and high intra–rater (ICC = 0.98) reliability and high internal consistency (Cronbach's alpha coefficient = 0.96).[2]

Concurrent validity

With the Barthel Index, r = 0.67, with the Timed Up and Go Test, r = –0.76, and with the Tinetti Balance Test, r = 0.91.[3]

Clinical application

A score of < 45 was shown to be predictive of falls in older adults.[3] However, a later study showed that this cut–off score was only 53% sensitive in identifying people who fall, but was specific in identifying people who do not fall.[4] In other words, older adults who scored higher than a cut–off score of 45 were less likely to fall than those who scored below that cut–off score. The Berg Balance Scale also predicted a person's use of an assistive device,[4] as the scores of people who used a walker or cane indoors were different from each other and lower than those of individuals who only used a cane outdoors, or who walked without an assistive device. The Berg Balance Scale differentiated people with stroke from people without stroke.[4]

Scores can improve after training in mobility and balance, and the test is responsive to changes in clinical status. The Berg Balance Scale measures many aspects of balance, and requires very little equipment.

The scale has been used for insurance reports and the Medicare Program in the USA. In an investigation of the feasibility of using different clinical measures as screening tests for referral to physical therapy, the Berg Balance Scale yielded one of the most promising results.[5]

Limitations

This scale takes 15 minutes to administer, which is longer than the other balance scales. There is a potential ceiling effect with higher-level patients. The Berg

Balance Scale does not include gait items. Some training is required in the use of the scale.

Modification

A lower cut-off score of 40/56 has been recommended for assessing fall risk.[6] Although the original scale is used without modifications, it has been recommended that users omit the first 5 items on the scale if the subject is able to stand.[7]

BERG BALANCE SCALE

Patient's name: . . . .

Date: . . . .

1. **Sitting to standing**

    Please stand up. Try not to use your hands for support.

    Able to stand, not using hands, and stabilise independently = 4 points

    Able to stand independently using hands = 3 points

    Able to stand using hands after several tries = 2 points

    Needs minimal assistance to stand and stabilise = 1 point

    Needs moderate or maximal assistance to stand = 0 points

2. **Standing unsupported**

    Stand for 2 minutes without holding on to support.

    Able to stand safely for 2 minutes = 4 points

    Able to stand for 2 minutes with supervision = 3 points

    Able to stand for 30 seconds, unsupported = 2 points

    Needs several tries to stand for 30 seconds, unsupported = 1 point

    Unable to stand for 30 seconds, unassisted = 0 points

3. **Sitting unsupported, with feet on floor**

    Sit with arms folded for 2 minutes.

    Able to sit safely and securely for 2 minutes = 4 points

    Able to sit for 2 minutes under supervision = 3 points

    Able to sit for 30 seconds = 2 points

    Able to sit for 10 seconds = 1 point

    Unable to sit unsupported = 0 points

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4. **Standing to sitting**

Please sit down.

Sits safely with minimal use of hands = 4 points

Controls descent by using hands = 3 points

Uses backs of legs against chair to control descent = 2 points

Sits independently but has uncontrolled descent = 1 point

Needs assistance to sit down = 0 points

5. **Transfers**

Please move from chair to bed and back again.

One way towards a seat with armrests.

One way towards a seat without armrests.

Able to transfer safely with minimal use of hands = 4 points

Able to transfer safely with definite use of hands = 3 points

Able to transfer safely with verbal cueing and/or supervision = 2 points

Needs assistance of one person = 1 point

Needs assistance of two people to transfer safely/unable to transfer = 0 points

6. **Standing unsupported with eyes closed**

Close your eyes and stand still for 10 seconds.

Able to stand still for 10 seconds safely = 4 points

Able to stand still for 10 seconds with supervision = 3 points

Able to stand still for 3 seconds = 2 points

Unable to keep eyes closed for 3 seconds, but stays steady = 1 point

Needs help to keep from falling = 0 points

7. **Standing unsupported with feet together**

Place your feet together and stand without holding on to support.

Able to place feet together independently and stand safely for 1 minute = 4 points

Able to place feet together independently and stand for 1 minute with supervision = 3 points

Able to place feet together independently, but unable to hold for 30 seconds = 2 points

Needs help to attain position, but able to stand for 15 seconds
= 1 point

Needs help to attain position, and unable to hold for 15 seconds
= 0 points

8. **Reaching forward with outstretched arm**

Lift arms to 90 degrees. Examiner places ruler at the fingertips
when arm is at 90 degrees. Stretch out your fingers and reach
forward as far as you can. Do not move your feet. When possible
use both arms to avoid rotation of trunk.

Can reach forward confidently more than 10 inches = 4 points

Can reach forward more than 5 inches = 3 points

Can reach forward more than 2 inches = 2 points

Reaches forward, but needs supervision = 1 point

Needs help to keep from falling = 0 points

9. **Picking up item from floor**

Pick up the shoe/slipper which is placed in front of you on the floor.

Able to pick up the slipper safely and easily = 4 points

Able to pick up the slipper, but needs supervision, and keeps
balance independently = 3 points

Unable to pick up the slipper, reaches 2–3 inches from it = 2 points

Unable to pick up the slipper, and needs supervision when trying
= 1 point

Unable to pick up the slipper, and needs assistance to keep from
falling = 0 points

10. **Turning to look behind over left and right shoulder**

Turn to look behind you over your left shoulder, and then repeat
over your right shoulder.

Looks behind from both sides and shifts weight well = 4 points

Looks behind to one side only, other side shows less weight shift
= 3 points

Turns sideways only, but maintains balance = 2 points

Needs supervision when turning = 1 point

Needs assistance to keep from falling = 0 points

11. **Turning through 360 degrees**

Turn around completely in a full circle one way, pause, and then turn a full circle in the opposite direction.

Able to turn through 360° safely each way in less than 4 seconds = 4 points

Able to turn through 360° safely to one side in less than 4 seconds = 3 points

Able to turn through 360° safely but slowly = 2 points

Needs close supervision or verbal cueing = 1 point

Needs assistance while turning = 0 points

12. **Number of times stool touched while stepping**

Place each foot alternately on the stool. Continue until each foot has touched the stool four times.

Able to stand independently and safely and complete 8 steps in 20 seconds = 4 points

Able to stand independently and complete 8 steps in 20 seconds = 3 points

Able to complete 4 steps, without aid, with supervision = 2 points

Able to complete more than 2 steps, needs minimal assistance = 1 point

Needs assistance to keep from falling/unable to try = 0 points

13. **Standing unsupported with one foot in front of the other**

(Demonstrate this to subject first.) Place one foot in front of the other. If you feel that you cannot place your foot directly in front, try to step far enough ahead for the heel of your forward foot to be in front of the toes of the other foot.

Able to place feet in tandem independently and hold for 30 seconds = 4 points

Able to place one foot in front of the other independently and hold for 30 seconds = 3 points

Able to take small step independently and hold for 30 seconds = 2 points

Needs help to step, but can hold for 15 seconds = 1 point

Loses balance while stepping or standing = 0 points

14. **Standing on one leg**

Stand on one leg for as long as you can without holding on.

Able to lift leg independently and hold for 10 seconds = 4 points

Able to lift leg independently and hold for 5–10 seconds = 3 points

Able to lift leg for more than 3 seconds = 2 points

Tries to lift leg, unable to hold for 3 seconds, but remains standing independently = 1 point

Unable to try, or needs assistance to prevent falling = 0 points

Total score (maximum possible score = 56)

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FUNCTIONAL REACH TEST

Functional reach manoeuvres have been used extensively by the US Department of Transportation, the National Aeronautics and Space Administration (NASA)

and the US Automotive Industry for safety and functional utility of vehicle design. For older adults, functional reach is a dynamic measure of stability during a self-initiated movement.[1] The Functional Reach Test was designed as a clinical measure of balance, and was originally tested on a sample of 128 community-dwelling adults between 21 and 87 years of age.[1]

Scoring

Functional reach is the difference in inches between a person's arm length and maximum forward reach with the shoulder flexed to 90 degrees while maintaining a fixed base of support in standing. In other words, it is the maximum distance one can reach forward beyond arm's length. The distance is measured with a yardstick mounted on the wall, parallel to the floor, at the level of the person's shoulder.

The subject is asked to stand with their feet a comfortable distance apart, to make a fist and to forward flex the dominant arm to approximately 90 degrees. They are then asked to reach forward as far as possible without taking a step or touching the wall. The distance between the start and end points is measured using the head of the metacarpal of the third finger as the reference point.[1] Two practice trials and three test trials are performed, with the mean of the three test trials documented in inches or centimetres. A carefully trained clinician should be capable of reading the measurement on a yardstick to the nearest 0.5 inches.

FUNCTIONAL REACH NORMS

Age (years)	Men (inches)	Women (inches)
20–40	16.7±1.9	14.6±2.2
41–69	14.9±2.2	13.8±2.2
70–87	13.2±1.6	10.5±3.5

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Administration time

It takes 1–2 minutes to administer the test.

Tools

A yardstick, Velcro and level are needed.

Reliability

The test has good inter-rater reliability (ICC = 0.98) and test–retest reliability (r = 0.89).[2]

Concurrent validity

This has been determined with walking speed (r = 0.71), tandem walk (r = 0.71) and mobility skills (r = 0.65).[2]

Clinical application

A score of ≤ 6 was shown to be predictive of falls in the elderly[3] (predictive validity). The Functional Reach Test measures dynamic postural control. It is a continuous measurement system that enables greater sensitivity than categorical or ordinal measures. The advantages of functional reach are that it is a quick, precise and portable test, it requires minimum equipment, is single task and is sensitive to change following balance training.

Limitations

The test measures dynamic stability in only one direction and with no change in the base of support. Many activities that are difficult for the elderly, such as gait, involve controlled movement of the centre of mass laterally as well as in an anterior direction and outside the stability limits. Height, age and gender can influence the results to a certain extent. It is difficult to perform the Functional Reach Test in patients with dementia or spinal deformities, and in frail individuals who are unable to stand unsupported. Also it can only be used to test individuals who have adequate shoulder range of motion to perform the test and are able to maintain a standing position for several minutes without an assistive device.

Despite its limitations, this test is a useful tool for screening, assessing, monitoring over time and even predicting functional status in older people. It is appropriate in a variety of settings, including acute care, inpatient and outpatient rehabilitation, home health and community screening.

The test has been expanded to include reaching to both sides and behind the subject.[4]

Lateral Reach Test

This test was developed to assess mediolateral postural control.[5] The subject stands near a wall with their arm abducted at 90 degrees. They are asked to reach directly sideways as far as possible without overbalancing, moving step or touching a wall. No knee flexion or trunk rotation is permitted. Maximum hand excursion is measured. In a study of 60 community-dwelling women aged 72.5±5 years, the mean lateral reach observed was 20.0±4.88 cm, with a range of 10–36

cm.[5] The test–retest reliability was very high (ICC = 0.943). The results decrease with increasing age, decreasing height and decreasing arm length.

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TINETTI BALANCE TEST

This is a performance test of balance and gait during manoeuvres used during normal daily activities.[1]

Scoring

Scoring is done on a 3-point ordinal scale with a range of 0–2, where a score of 0 represents maximum impairment and a score of 2 represents independence. The individual scores are then combined to form three measures – *gait score*, *balance score* and *overall score*. The test has two components.

◗ *The balance portion* has 9 manoeuvres which are graded on an ordinal scale as either normal adaptive or abnormal. The maximum total score is 16 points.

◗ *The gait portion* has 7 gait characteristics which are graded as normal or abnormal. The maximum total score is 12 points. The subject first walks at 'usual pace' and then walks at 'rapid but safe pace.'

The total mobility score for balance and gait is then calculated. The maximum possible score is 28 points.

Tinetti total score	Risk of falls
≤ 18	High
19–23	Moderate
≥ 24	Low

Administration time

It takes around 10 minutes to administer the test.

Tools

A chair, stopwatch, 5 lb object and 15-foot walkway are required.

Reliability

The inter-rater reliability is 85%.[2]

Concurrent validity

With the Berg scale, r = 0.91, with stride length r = 0.62–0.68, and with single leg stance r = 0.59–0.64.[2]

Clinical application

Four items related to balance (unsteady sitting down, unable to stand in single stance, unsteady turning, and unsteady when nudged) and three items related to gait (increased trunk sway, increased path deviation, and speed) in combination have been found to predict falls.[3] People with scores of < 18 have an increased risk of falls for balance and gait items.[4] Scores can improve after training on gait and balance items. The advantages of the Tinetti Balance Test are that it assesses many aspects of balance, and is simple and quick to use, but it is not sensitive enough to changes in balance.

TINETTI ASSESSMENT TOOL: BALANCE

Patient's name: . . . .   Date: . . . .

Location: . . . .   Rater: . . . .

. . . .

Initial instructions: The subject is seated on a hard, armless chair. The following manoeuvres are tested.

Task	Description of balance	Possible points	Score
1. Sitting balance	Leans or slides in chair	0	
	Steady and safe	1	
2. Arises	Unable to arise without help	0	
	Able to arise, uses arms to help	1	
	Able to arise without using arms	2	

Task	Description of balance	Possible points	Score
3. Attempts to arise	Unable to attempt to arise without help	0	
	Able to arise, requires more than one attempt	1	
	Able to arise in one attempt	2	
4. Immediate standing balance (first 5 seconds)	Unsteady (swaggers, moves feet, trunk sway)	0	
	Steady, but uses walker or other support	1	
	Steady without walker or other support	2	
5. Standing balance	Unsteady	0	
	Steady, but wide stance (medial heels > 4 inches apart), and uses cane or other support	1	
	Narrow stance without support	2	
6. Nudged (subject at maximum position with feet as close together as possible, examiner pushes lightly on subject's sternum with palm of hand three times)	Begins to fall	0	
	Staggers, grabs, catches self	1	
	Steady	2	
7. Eyes closed (at maximum position no. 6)	Unsteady	0	
	Steady	1	
8. Turning through 360 degrees	Discontinuous steps	0	
	Continuous steps	1	
	Unsteady (grabs, staggers)	0	
	Steady	1	
9. Sitting down	Unsafe (misjudged distance, falls into chair)	0	
	Uses arms or not a smooth motion	1	
	Safe, smooth motion	2	
	Balance score (out of 16):		

TINETTI ASSESSMENT TOOL: GAIT

Patient's name: . . . .   Date: . . . .

Location: . . . .   Rater: . . . .

. . . .

Initial instructions: Subject stands with examiner, walks halfway down or across the room, first at 'usual' pace, then back at 'rapid but safe' pace (using usual walking aids).

Task	Description of balance	Possible points	Score
10. Initiation of gait (immediately after subject is told to 'go')	Any hesitancy or multiple attempts to start	0	
	No hesitancy	1	
11. Step length and height	Right swing foot does not pass left stance foot with step	0	
	Right foot passes left stance foot	1	
	Right foot does not clear the floor completely with step	0	
	Right foot completely clears floor	1	
	Left swing foot does not pass right stance foot with step	0	
	Left foot passes right foot stance	1	
	Left foot does not clear floor completely with step	0	
	Left foot completely clears floor	1	
12. Step symmetry	Right and left step length not equal	0	
	Right and left step appear equal	1	
13. Step continuity	Stopping or discontinuity between steps	0	
	Steps appear continuous	1	

Task	Description of balance	Possible points	Score
14. Path (estimated in relation to floor tiles 12 inches in diameter; observe excursion of 1 foot over about 10 feet of the course)	Marked deviation	0	
	Mild/moderate deviation or uses walking aid	1	
	Straight without walking aid	2	
15. Trunk	Marked sway or uses walking aid	0	
	No sway, but flexion of knees or back, or spreads arms out while walking	1	
	No sway, no flexion, no use of arms, and no use of walking aid	2	
16. Walking stance	Heels apart	0	
	Heels almost touching while walking	1	
	Gait score (out of 12):		
	Balance and gait score (out of 28):		

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