

**NATIONAL GUIDELINE
ON PREVENTION
OF FALLS OF
OLDER PERSONS**

INTRODUC- TION

Falling is a serious blow to anyone's confidence and represents a potential threat to an older person's independence. It is the leading cause of morbidity and reduced physical activity in those over the age of 65 and the largest single cause of death due to injury in the elderly. In older patients hospitalised for a fall, only about 50% will still be alive a year later. Falls are often the indirect cause of death, as when pneumonia or pulmonary emboli follow a period of immobility due to a fall. Compared to males, females have a higher incidence of fractures other than the skull. Males are nearly twice as likely to die, however, following a fall injury than are females.

Despite these grim statistics, most falls in the elderly do not end in death or significant physical injury. This does not imply that such falls are benign events. The psychological damage owing to loss of self-esteem and fear of falling again, can be severely debilitating and can create the tendency to fall and lead to self-protective immobility.

Instability ranks amongst the four major conditions of old age - the others being immobility, incontinence and intellectual impairment. These problems are often interrelated in that prolonged immobility invariably results in instability, and persistent falling will result in a loss of confidence and a reluctance to walk. Studies have indicated that older persons on medication are at risk of falling. Age-associated susceptibility to drug toxicity can lead to poor coordination and confusion.

The onset of instability is often a presenting symptom of disease in the elderly and may, in fact, herald the beginning of a steady decline in health.

• Any fall in the elderly may signal impending
• major illness. Falls may be caused by **any** acute
• or chronic illness that causes weakness or dizziness. Myocardial infarction, stroke or gastrointestinal (GI) tract bleeding may well present with
• falls. A fall can be the first sign of urinary tract,
• respiratory or gall-bladder infection.

• Postural hypotension is a common cause (17%)
• of recurrent dizziness and falls in the older person and is especially notable on rising after prolonged bedrest. Vasoactive drugs are the most
• common culprits, typically antihypertensive agents, vasodilators used for angina, and tricyclic
• antidepressants.

• South Africa's population aged 65 years and over
• is projected to quadruple over the coming four decades. The 'oldest' old-age group, i.e. persons
• aged 85 years and older, is growing more rapidly than any other age group. With increased longevity, older persons will have extended periods
• at risk for physical and mental impairment. This makes falls a major public health concern. The
• ability to get up after a fall is important to maintain mobility and lessen fear of subsequent falls
• or further damage. Severe injuries may increase the burden on family or care providers or increase
• health costs.

• Women comprise 70% to 80% of patients with
• hip fractures. In patients with osteoporosis falls commonly cause hip fractures. Most hip fractures
• result from comparatively minor falls such as falls from a bed, a chair or from a standing position.

• The reasons for a patient's inability to get up or

to get help or assistance are associated with the causes that result in falls. If a person remains on the floor or the ground, the physical and psychological morbidity may be serious. Dehydration, pressure sores and pneumonia have all been reported in persons found lying for prolonged periods after falls.

The frequency of inability to get up and the short and long-term morbidity associated with this inability suggest the need for preventive and treatment efforts. The majority of falls do not result in serious morbidity, but possible sequelae include deterioration in gait, physical trauma ranging from minor soft tissue injuries to fractures, with or without hospitalisation, and activity restriction or death.

To prevent falls in older persons.

Target population for:

Prevention of falls

- Older persons \geq 60 years.

Health education and health promotion

- Caregivers of older persons, general public and older persons.

Training

- All categories of professional health workers and other categories of persons and professions working with older persons.

MANAGEMENT
OBJECTIVES

SCOPE OF
THE GUIDE-
LINE

CAUSES OF FALLS

• Causes:

• A falling episode is a marker of homeostatic **dysfunction** and a result of an interaction of intrinsic and extrinsic factors.

• **Intrinsic risk factors** include age-related physiological changes (poor vision - 51%), pathologic disease (foot problems - 69%), drug toxicity (inappropriate medication - 67%) and psychological factors.

• **Extrinsic risk factors** are environmental hazards, such as unsatisfactory footwear (59%), slippery floors and poorly lit stairs.

• Causes differ from males to females. Males have a higher prevalence of other impairments, such as poor vision, unsteady gait, chronic medical conditions that predispose them to falls which may contribute to their death. Males often take more risks that can result in falls.

PREVENTION OF FALLS

• Prevention:

• Prevention of falls is critical to the health of all older persons including those without a history of falling. Even older persons with no previous falls express fearful anticipation of falling. Such persons usually have an underlying gait dysfunction or imbalance problem that may lead to self-imposed restriction of activities and immobility and may result in them being house-bound or chair-bound. Falls cannot be prevented unless risk factors are identified.

Causes	Prevention
■ Physiologic changes with normal ageing	<ul style="list-style-type: none"> - Do a physical examination to determine fall risk factors (refer Annexure A). - Prevent inactivity through exercises, e.g. walking, gardening (refer <i>Guideline for the Promotion of Active Ageing in Older Adults</i>). - Health education on healthy life-style (refer <i>Guideline on Prevention of Chronic Diseases of Lifestyle (CDL)</i>).
<ul style="list-style-type: none"> ❖ Vision decline is one of the most significant normal physiologic changes that places the older person at risk of falling. Poor vision is a modifiable risk factor. 	<ul style="list-style-type: none"> - Refraction and correctional interventions. - Prevention and treatment of all causes of avoidable blindness, e.g. cataracts, retinopathy.
<ul style="list-style-type: none"> ❖ Reaction time diminishes with age. 	<ul style="list-style-type: none"> - Educate to be cautious of falls. - Physical exercises.
■ Pathologic disease processes	
<ul style="list-style-type: none"> ❖ <i>Orthostatic hypotension</i> Older persons may have some postural hypotension as part of 'normal' ageing or because of diabetes, Parkinson's disease or certain medication. 	<ul style="list-style-type: none"> - Do not stand up suddenly. - Raise the head of the bed during sleep. - Bedridden patients to sit up at intervals. - Use steroids only as prescribed.
<p>Large venous varicosities may cause postural drop in blood pressure owing to significant blood pooling in the legs.</p>	<ul style="list-style-type: none"> - Use elastic stockings as per prescription. - Elevate feet while sedentary.
<p>Immobolised persons.</p>	<ul style="list-style-type: none"> - Rehabilitation, e.g. physiotherapy, occupational therapy. - Do exercises, when sedentary (refer Annexure B). - Other passive exercises.
<p>Dehydration and/or haemorrhage can cause changes in blood volume and postural hypotension.</p>	<ul style="list-style-type: none"> - Educate older persons on normal fluid intake. - Assist with intake of fluids where necessary.

Causes	Prevention
❖ <i>Arrhythmia</i> A fall that occurs abruptly, with or without loss of consciousness, and that is preceded by dizziness or palpitations, suggests the possibility of cardiovascular disorders and cerebro-vascular disorders (Transient Ischaemic Attack (TIA)).	<ul style="list-style-type: none"> - Intravenous therapy where applicable. - Regular physical assessment by a professional for at-risk identification. - Determine cause of abrupt fall if and when it occurs.
❖ <i>Premonitory falls</i> Any fall must be considered a possible sign of impending major illness or infection, bladder/gall-bladder infection.	<ul style="list-style-type: none"> - Regular physical assessment. - Hormone therapy and calcium supplementation to prevent osteoporosis in the female. - Self-inspection of stools.
❖ <i>Seizure</i> Patients with a history of epilepsy or seizure because of recent stroke.	<ul style="list-style-type: none"> - Educate people to be cautious where there is a history of epilepsy and to adhere to disease-management regimen. - Educate persons with epilepsy to become aware of the 'aura' they have prior to a seizure and to position themselves in a safe environment.
❖ <i>Impaired gait</i> A variety of pathologic neuromuscular and arthritic changes can impair the gait of older persons and increase the risk of falling. Gait patterns change with age, resulting in decreased step height and decreased stride length.	<ul style="list-style-type: none"> - Do gait and balance assessment (refer Annexure C). - Provide with a cane/walker. - Grab bars and railing to walls will be helpful. - Non-slip carpets or no carpets. - Wear shoes with non-slip soles.
Foot deformities and pathology.	<ul style="list-style-type: none"> - Regular foot care (refer <i>Guideline on Foot Health at Primary Level</i>).

Causes	Prevention
<p>■ Drugs, psychological factors</p>	
<p>❖ Older persons on medication fall more often than those not on medication. Polypharmacy associated with multiple diseases, self-medication, as well as age-associated susceptibility to drug toxicity can lead to poor coordination and confusion.</p>	<ul style="list-style-type: none"> - Warn older persons against self-medication/over-the-counter medicines. - Rational prescribing of medication (reduce dosage or stop the drug if clinically feasible). - Assist disorientated persons in drug-taking (direct observed treatment). - Use central nervous system (CNS) drugs, sedatives, hypnotics, anxiolytics, anti-depressants and certain anti-inflammatory agents cautiously.
<p>❖ Many falls are associated with a precipitating psychosocial event, i.e. in older people who are lonely or feeling abandoned, falls may be intentional, in an effort to gain attention. Many falls occur during periods of transient emotional stress.</p>	<ul style="list-style-type: none"> - Counselling of older persons with stress-related disorders. - Community involvement, visits by volunteers, self-help groups, support groups.
<p>❖ Falls can also be associated with denial of the physical limitations imposed by the ageing process or to maintain an image of capability.</p>	<ul style="list-style-type: none"> - Counselling and education on the ageing process to accept limitations and changes.
<p>■ Extrinsic factors</p>	
<p>Falls are the most frequent type of accident among older persons, regardless of living arrangement.</p>	<ul style="list-style-type: none"> - Environmental hazards must be assessed and corrected (refer Annexure D). - Adhere to the SA Bureau of Standards building regulations.

ANNEXURE A

PHYSICAL EXAMINATION TO IDENTIFY POTENTIALLY MODIFIABLE FALL RISK FACTORS

Blood pressure (Postural Hypotension) 17% risk	Correlated blood pressure in following positions: Supine Standing
Visual (Poor vision 51% risk)	Perform the following: Acuity ✕ Pinhole test ∩ Red reflex test ◆ Peripheral vision ⊕ Colour discernment
Cardiovascular	Identify: Arrhythmias Carotid bruits (murmur) Vertebrobasilar dysfunction
Extremities	Determine: Degenerative joint disease Range of motion Podiatry problems (69% risk) Quality of footwear (59% risk)
Neurologic	Determine: Movement disorders and degenerative diseases of the nervous system Position sense Perform the following: Romberg test ★ Gait assessment Berg Balance Scale *
Inappropriate medication (67% risk)	Determine: Type of drugs taken, e.g. sedatives, diuretics, hypotensive agents Dosage of drugs Need for drugs

✘ **Acuity test**

The visual acuity of each eye is tested separately and then both eyes together, with the standard Snellen chart. If the patient uses corrective lenses, they should be worn.

⦿ **Pinhole test**

- Make a 1mm wide hole in a piece of paper with a large pin, needle or point of a pen or pencil.
- Ask the patient to look through this hole at the Snellen chart.
 - **If** vision improves, this suggests that the patient has a refractive error and needs glasses. Refer to optometrist.
 - **If** no improvement or vision becomes worse, then it is probably due to **cataract, glaucoma** or **retinal** disease, and needs to be **referred** to ophthalmologist.

◆ **Red reflex test**

- Procedure:
 - The patient looks past your head fixing on a distance target.
 - The examiner stands about 60cm away from the patient.
 - With the ophthalmoscope at 0 (zero) the examiner keeps it close to his eye and then focuses the beam of light so that it falls on the pupillary area of the cornea.
 - In normal individuals, the examiner should be able to see a red or pink colour (reflex) through the pupil which comes from the retina.

Significance of an absent red reflex

If there is a history of trauma or diabetes, the absence of a red reflex is probably due to:

- retinal detachment

- a vitreous or internal haemorrhage
- mature cataract
- cataracts: one usually sees black shadows against the red in immature cataracts
- absence of red reflex in mature cataracts
- in a patient above the age of 50 years with no history of trauma or previous eye disease, an absent red reflex is almost sure to be due to cataract formation (especially with decreased visual acuity).

Absent red reflex: refer to ophthalmologist.

⊛ ***Peripheral Vision***

The patient's peripheral field of vision is tested with a moving pencil or finger. Hold a pencil, approximately 30cm from the patient's eyes, directly in front of nose. Move pencil alternately to the patient's right and left sides maintaining an equidistance from the head. The point at which the pencil/finger disappears from the patient's line of vision on both sides indicates the patient's peripheral field of vision.

★ ***Romberg test***

Inability to stand erect without swaying if the eyes are closed. A sign of locomotor ataxia.

✱ ***Berg Balance Scale (BBS)***

The BBS consists of 14 activities that individuals perform in their daily routine. The tasks are ranked such that the base of support is decreased in the latter tasks, thus making the tasks more difficult. The tasks include stable positions, such as standing unsupported and sitting unsupported, as well as transition phases such as sit to stand, stand to sit, and picking up an object from the floor. The most difficult activities, tandem standing and one-legged standing, reduce the base of support. The BBS is scored on a scale of 0 to 4.

0 - being an inability to perform the task.

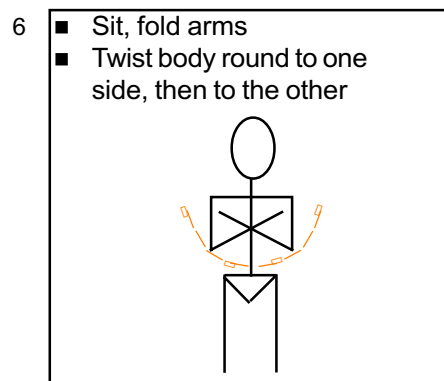
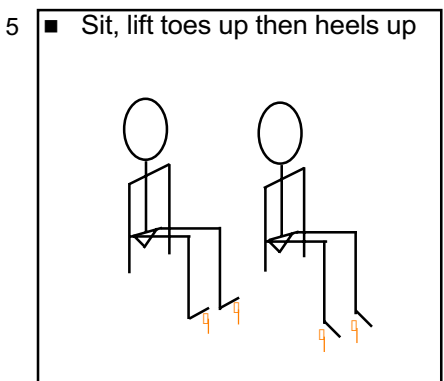
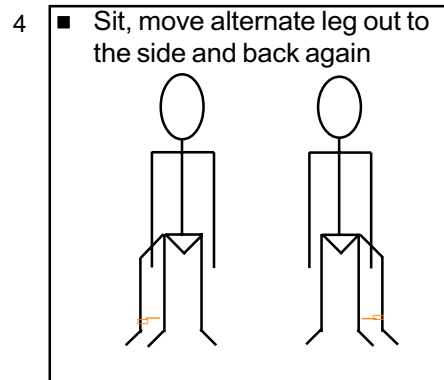
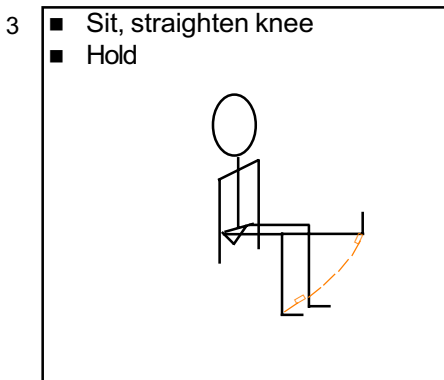
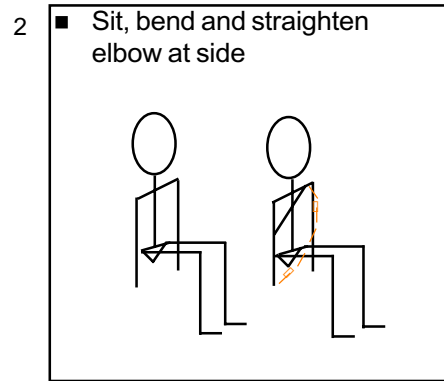
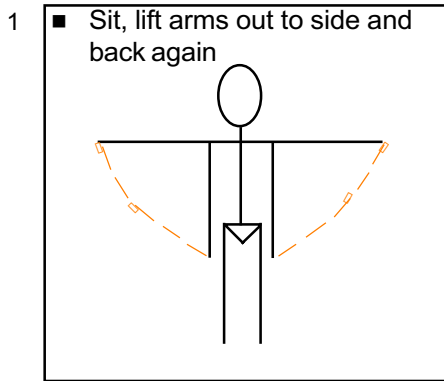
4 - ability to perform the task.

Maximum score: 56

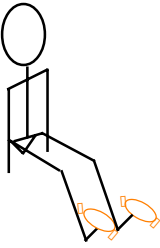
The test can be completed in approximately 15 minutes and requires a chair and a watch/stop-watch.

1. Sit to stand
2. Stand unsupported
3. Sit unsupported
4. Stand to sit
5. Transfer from chair to chair
6. Stand with eyes closed
7. Stand with feet together
8. Reach forward with outstretched arm
9. Retrieve object from floor
10. Turn to look behind
11. Turn 360 degrees
12. Place alternate foot on stool
13. Tandem standing (heel-to-toe)
14. Stand on one foot (left and right foot)

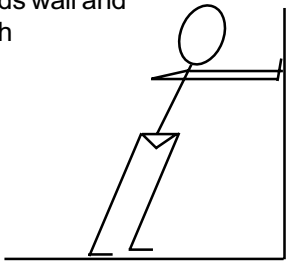
ANNEXURE B



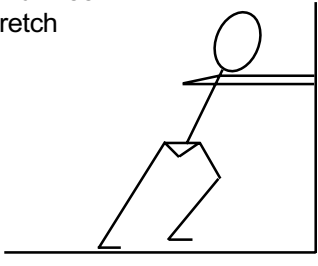
7 ■ Sit, circle ankles, heel on floor



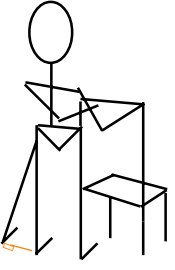
8 ■ Stand 0,5-1m from wall
 ■ Keep knees straight, lean towards wall and stretch



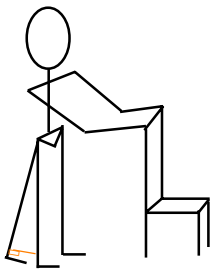
9 ■ Stand as before, move foot 15 cm in front and bend knee
 ■ Stretch



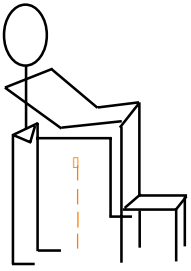
10 ■ Stand, use back of chair for balance
 ■ Move leg out to the side



11 ■ Stand as before
 ■ Keeping knee straight, extend leg out behind



12 ■ Stand, bend up alternate knee in front



• **Annexure C**



• **GAIT AND BALANCE ASSESSMENT**

• Rise from and sit in a chair

• Walk 6 meters at normal pace, turn around and tandem walk (heels touching toes) back. Observe for posture, balance, length of stride, coordination and steppage height.

• Stand with feet together, first with eyes open, then with eyes closed.

• With eyes open, perform sternal tap. Tap one foot at a time back and forth.

• Stand and reach arms upward; then bend down and pick up an object from the floor.

• Stand and touch chin to chest; then bend head backward, looking straight upward.

• Stand and turn head laterally to each side.

• Climb and descend a flight of stairs.

Annexure D

ENVIRONMENTAL ASSESSMENT FOR FALLS: A SAFETY CHECK-LIST

Exterior and stairs

- Are surfaces even?
- Are steps in good repair?
- Do steps have handrails?
- Are handrails securely fastened?
- Is lighting adequate?
- Are outside movement areas unobstructed?

Interior

- Are lights bright enough to compensate for limited vision?
- Are stairways adequately lit?
- Are night-lights sufficient?
- Do loose rugs have secure rubber backing?
Avoid all unnecessary rugs and mats.
- Are rooms uncluttered to permit easy mobility?
- Are chairs of sufficient height for easy transfer?
- Do door thresholds permit safe mobility?
- Are floors non-slippery?
- Are canes, walkers or wheelchairs available, in good repair and working condition?

Bathroom

- Are toilet and bathroom inside the house or outside?
- Is assistance available for people to access outside bathroom/toilet?
- Is the route to the bathroom/toilet marked?
- Are skid-proof strips or mats available in the bath or shower?

- - Does the bath/toilet have grab rails nearby?
- - Will the patient need an elevated toilet seat to ease transfer on and off toilet?
- - Are floors non-slippery?
- - Is a bell available to call for help?

• **Bedroom**

- - Is the bed of adequate height to allow for easy transfers?
- - Are rugs/carpets non-skid or well-anchored to the floor?
- - Are floors non-slippery?
- - Does person have a working torch at hand for night?
- - Are light switches accessible?
- - Is lighting adequate?
- - Are bedrails needed?
- - Are bedrails safe and stable?
- - Is a bell available to call for help?

• **Kitchen**

- - Is easy mobility ensured?
- - Are chairs of proper height for ease of transfer?
- - Are storage areas easily reached?
- - Are floors non-slippery?
- - Is lighting adequate?
- - Are mats non-skid?
- - Is the gas pilot light in good repair?
- - Are open fires safeguarded?

• **Lifts**

- - Are time-delay doors present?
- - Is there an emergency phone/button available?
- - Are floor buttons at a convenient height?

• **General**

- - Is informal/formal or both types of help available and accessible?

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