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My older patient with cancer reports falls: What should I do?



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ABSTRACT

Falling is one of the major geriatric syndromes, with a multi-factorial pathogenesis due to age-related changes, pathological conditions and environmental hazards. Such a multi-factorial syndrome needs a standardized approach aimed at identifying risk factors. A comprehensive loco-motor, gait and standing balance, cardiovascular and neurological assessment, as well as a drugs regimens review, should be part of the routinely approach. Modification of environmental hazards, exercise training, behavioral and pharmacological treatment of specific diseases which can be the leading cause of falls, should all be part of an individualized intervention. Particular attention should be paid in the evaluation of unexplained falls, which can mask hypotensive or arrhythmic syncope.

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1. Introduction

Falling is one of the major geriatric syndromes affecting mortality, morbidity and institutionalization.¹ Thirty-four percent

of community dwelling patients older than 65 years old and 50% of octogenarians fall at least once a year. Incidence rates for falls in nursing homes and hospitals are two to three times greater than in the community and complication rates are

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also considerably higher.² Ten percent of the admissions to the Emergency Department (ED) and 6% of urgent hospitalizations are due to fall-related injuries³; 5–10% of older patients experience fractures and concussions⁴ and in about 1% of the cases a hip fracture occurs, with a 20 to 30% one-year mortality and loss of functional capacity.⁵ The consequences of falling or not being able to get up after a fall can include, besides physical injuries, psychological problems, as fear of falling and loss of confidence in being able to move safely, leading to social isolation and depression, increase in dependency and disability, loss of mobility, hypothermia, pressure-related injury and infection.

Cancer is a disease of aging too. Considering the growing incidence of cancer in older adults who may be at greater risk for falls and the aging process of the population, attention to falls becomes mandatory to meet the clinical needs of this growing population.

2. Pathogenesis and Risk Factors

The pathogenesis of falls is multi-factorial due to age-related changes, pathological conditions, and environmental hazards (Table 1, 6).

Ambulatory problems and muscle weakness are responsible for 10–25% of the falls.⁷ The type of injury sustained is determined by the way of falling: wrist fractures usually result from forward or backward falls onto an outstretched hand and hip fractures typically from falls to the side, whereas backward falls directly onto the buttocks have much lower rates of associated fractures.⁸ Although the reduction of muscle strength is part of the physiological aging process, much of this is probably attributable to co-morbidity and physical inactivity. Falls are indeed the result of the interaction between increased individual susceptibility, high risk activities and environmental hazards, as carpets, thresholds, stairs, slippery surfaces, inadequate lighting or, on the contrary, excessive or dazzling illumination which contribute to the fall's dynamic in 30–50% of the cases.⁹ Frequently a fall happens in the domestic environment, because older patients are prone to spend most of

their time at home, feeling unsafe and less confident outside on their own, and on the contrary feeling more confident in the well-known domestic space. Inpatients or older adults in nursing homes are more prone to fall getting out of bed, getting into or out of the bath, or during postural changes.¹⁰ Restraints on older inpatients can worsen the risk of falling, increasing the level of mental confusion or psychomotor agitation. The risk of falling is four times higher after discharge from the hospital or in the sub-acute phase of an illness because bed rest, wheel-chair restriction or immobilization reduces muscles strength and predisposes to orthostatic de-conditioning.¹¹

A recent systematic review suggests that falls in older adults with cancer may be more common than among community-dwelling older adults without. Especially cancer symptoms and treatment factors were examined.¹² Daily pain was associated with a 44% greater odds of falls [OR 1.44 (95% CI 1.32–1.59)] in one study¹³ and an 87% greater odd of falls in another [OR 1.87 (95% CI 1.03–3.4)].¹⁴ Cancer treatment, with increasing numbers of cycles of neurotoxic chemotherapy, accelerates frailty more than increasing age, such that chronological age is no longer an important predictor of falls in an oncology population. Nearly one in five older adults with cancer will develop a new risk factor for falls subsequent to starting chemotherapy.¹² Moreover, certain chemotherapeutic agents¹⁵ and advanced cancer stage¹⁶ represent unique falls' risk factors for patients with cancer.

3. Assessment of Older Patients with Falls

Such a multi-factorial syndrome, needs a comprehensive and standardized approach (Fig. 1), as suggested by the National Institute for Health and Care Excellence (NICE).¹⁷ The latest update of the NICE guidelines¹⁸ highlights: "Older people in contact with healthcare professionals should be asked routinely whether they have fallen in the past year and asked about the frequency, context and characteristics of the fall/s." Obtaining a full report of the circumstances, supported by witnesses' account, is an essential step of the fall's clinical history, because the patient may have a poor recollection of the event. The fall circumstances can help in the etiological differential diagnosis: an abrupt sit or lie down to standing change prior to falling, suggests orthostatic hypotension (OH), trip or slip suggests gait, balance or vision disturbance or an environmental hazard, drop attack can be due to vertebrobasilar insufficiency, and carotid sinus compression can lead to a fall when looking up or sideways. Symptoms experienced near the time of falling may also point to a potential cause. Dizziness can suggest OH, vestibular problem, hypoglycaemia, arrhythmia and drug-side effects, palpitations can be related to an arrhythmia, incontinence or tongue biting can suggest seizure, asymmetric weakness may be associated with cerebrovascular disease and chest pain a myocardial infarction or coronary insufficiency.

Particular attention should be paid on the evaluation of the patient's drugs regimen and the time relationship between the assumption and appearance of adverse effects. Antiarrhythmic drugs, antihypertensives, nitrates, diuretics, antidepressants, antipsychotics, and benzodiazepines, are relevant fall risk

Table 1 – Causes of falls in the elderly: summary of 12 studies, modified by Rubenstein LZ et al.⁶

Cause	Mean Percentage ^a (%)	Range ^b (%)
'Accident'/environment-related	31	1–53
Gait/balance disorders or weakness	17	4–39
Dizziness/vertigo	13	0–30
Drop attack	9	0–52
Confusion	5	0–14
Postural hypotension	3	0–24
Visual disorder	2	0–5
Syncope	0.3	0–3
Other specified causes ^c	15	2–39
Unknown	5	0–21

^a Mean percentage calculated from the 3.628 falls in the 12 studies.

^b Ranges indicate the percentage reported in each of the 12 studies.

^c Arthritis, acute illness, drugs, alcohol, pain, epilepsy and falling from bed.

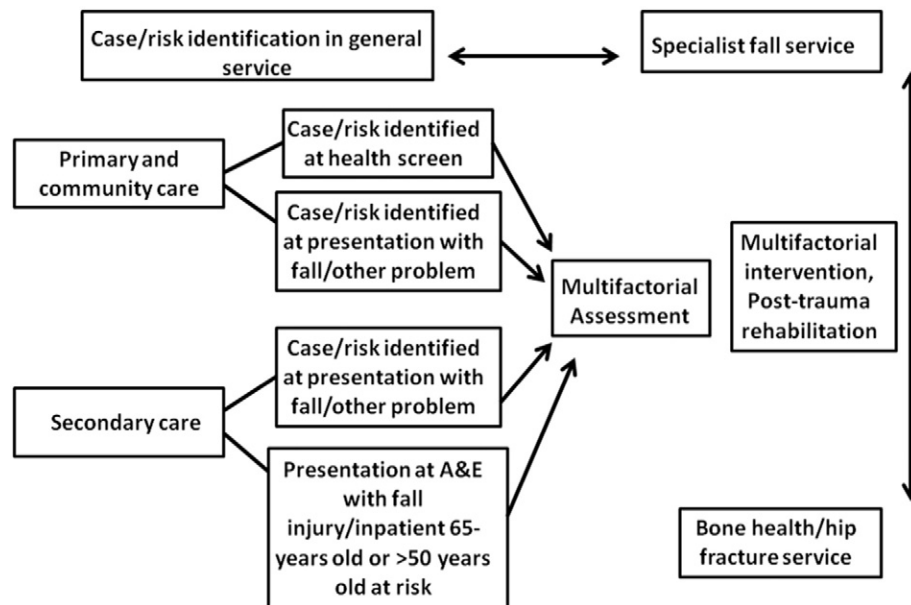


Fig. 1 – Falls assessment and prevention pathway, modified from NICE clinical practice guideline.¹⁷ A&E = accident and Emergency

factors both in their acute and chronic use, with a significant rise in the risk of falling in polypharmacy regimens.¹⁹

Patients who report one fall requiring medical aid/assistance, two or more falls in the past year or demonstrate abnormalities of gait and/or balance should then be offered an individualized multi-factorial falls risk assessment. It has also been demonstrated that the greater the number of risk factors, the greater the risk of falling; the proportion of community-dwelling patients with recurrent falls increases from 10% to 69% when the number of risk factors increases from 1 to 4 or more.¹¹

The patient should be evaluated for gait and standing balance, mobility, and muscle weakness. Close observation of how the patient rises from a chair, stands with eyes open and closed, walks, turns and sits down, should be assessed. A formal gait assessment screening through the Tinetti balance and gait instrument can be helpful.²⁰ The Short Physical Performance Battery (SPPB) is a well-established, reliable, valid measure of lower-extremity performance, including a test of standing balance, a timed 4-m usual-pace walk, and a timed test of five repeated chair stands. Each test is scored from 0 to 4, with a maximum summed score of 12 for the three tests and higher scores indicating better functioning. The SPPB is predictive of disability, hospitalization and mortality in older populations.²¹ The utility of SPPB as part of an injurious falls risk assessment strategy in older adults has been recently determined.²² Multiple components of functional performance were assessed separately and in combination using the SPPB to evaluate injurious falls risk. The chair stand component of the SPPB performed better than the combined score, which includes balance and gait speed. This has important clinical implications, suggesting that a short, simple chair stand test, which may identify lower-extremity weakness, poor muscle power, and limitations in dynamic balance, may be sufficient for evaluating performance as part of a risk stratification strategy for injurious falls.

The patients should also be evaluated for osteoporosis risk, visual impairment and urinary incontinence. A comprehensive cardiovascular and neurological assessment, should be part of the routinely approach.¹⁸ The cognitive status should be screened and the Mini Mental State Examination, a 30-item internationally validated tool, is adequate for this purpose.²³ Details of social circumstances, injuries, impact of the event on confidence and ability to carry out basal/instrumental activities of daily living independently, should be recorded.

Finally, considering the weight of the fear of falling on the quality of life of elderly patients, instruments for its detection could be used, as the Falls Efficacy Scale (FES)²⁴ and the FES-International (FES-I).²⁵

3.1. Unexplained Falls

Falls which are not accidental, not related to a clear medical condition or drug-induced, are defined “unexplained”²⁶ and represent a relevant cause of hospital admission and sanitary cost increase.²⁷ Especially in older adults in whom the circumstances cannot always be established, because of the lack of witnesses and the amnesia for the episode, a misdiagnosed syncope may indeed underlie an unexplained fall. About 20% of cardiovascular syncope in patients older than 70 years old appears indeed as a fall, especially when carotid-sinus syndrome (CSS) and OH are diagnosed, more than 20% of older patients with CSS complains of falls as well as syncope.²⁸ Kenny R.A has analyzed patients older than 60 years old, who were referred to the hospital for a fall or a syncope. Those referred for a fall, who had CSS during Carotid Sinus Massage (CSM), showed retrograde amnesia for the loss of consciousness more frequently than patients with syncope.²⁹ As recently shown, more than one third of all the falls in patients in orthopedic wards are unexplained, particularly in those with depressive symptoms and syncopal spells,³⁰ suggesting the need for a comprehensive assessment at the very beginning of the medical pathway.

The neuro-autonomic evaluation, as proposed by the European Society of Cardiology (ESC) guidelines on management of syncope,³¹ through the active standing test, Tilt Testing (TT) and CSM should be performed in patients with unexplained falls, as the positivity prevalence of TT and CSM has proved to be similar in these patients compared to those with unexplained syncope.³² The active standing test, which consists in the measurement of blood pressure (BP) in the supine position and orthostatic position, is a relevant diagnostic step, given the age-related increased rate of OH, 24.3% in the 8th decade and 30.9% in the 9th decade.³³ The test is diagnostic when there is a symptomatic fall in systolic blood pressure (SBP) from a baseline value ≥ 20 mmHg or diastolic BP (DBP) ≥ 10 mmHg or a decrease in SBP to < 90 mmHg.³¹

When an underlying arrhythmia is highly probable in patients with recurrent falls, ambulatory ECG and external event recorder can be used to obtain a correlation between heart rhythm disturbance and falls. The Implantable Loop Recorder (ILR) could be an additional diagnostic tool, to provide an ECG documentation of events that occur sporadically.³¹ It has been demonstrated in a population of highly selected patients, with a mean age of 71 years and an initial diagnosis of either epilepsy or unexplained fall that the ILR gave a documentation of a relapse of their index attack and that, in about a quarter of patients, the final diagnosis was of arrhythmic syncope. Moreover, when the arrhythmia was not documented at the time of a spontaneous attack, ILR monitoring definitely excluded an arrhythmic cause.³⁴

4. Multi-factorial Intervention

If a clear diagnostic entity is identified, the logical progression to management is self-evident, as administration of antiarrhythmic drugs or pacemaker implantation when the fall is clearly related to an arrhythmia or to a cardiogenic syncope. Hypovolaemia or dehydration requires fluid administration. Treatment of OH involves behavioral maneuvers, as elimination of antihypertensives, expansion of extracellular volume, salt and water intake, in the absence of hypertension, elevation of the head of the bed to reduce nocturnal hypertension, abdominal binders or compression stockings,³¹ and pharmacological treatment, as midodrine and 9- α -fluorohydrocortisone,³⁵ pyridostigmine³⁶ and droxidopa.³⁷

Modification of environmental hazards, training paths and appropriate use of support tools (sticks, walkers), which can be effective elements of a multi-factorial intervention program, are indicated.³⁸ Hip protectors probably reduce the risk of hip fractures, but, may slightly increase the small risk of pelvic fractures. Poor acceptance and adherence by older people offered hip protectors are barriers to their use.³⁹

Regular exercise can delay age-related risk factors, maintaining or improving physical health and activity in older adults leading to a decrease in fall risk. As recently confirmed in a meta-analysis of 17 trials, exercise program emphasize balance training. However, most programmes are multicomponent, including gait and functional training, strengthening exercises, flexibility, and endurance. These types of interventions can improve reaction time, gait, muscle strength,

coordination and overall physical functioning as well as cognitive functions.⁴⁰

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There are no conflicts of interest for either author.

Author Contributions

Andrea Ungar and Martina Rafanelli conceived the article concept and drafted the manuscript. Both agreed on the final version of the manuscript.

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