



EVIDENCE BASED NURSING

Summary

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Fall prevention for older and elderly persons in hospitals and chronic care facilities
Evidence-based Guideline

STURZPROPHYLAXE

für ältere und alte Menschen
in Krankenhäusern und
Langzeitpflegeeinrichtungen

Evidence-based Leitlinie

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Title:

Evidence-based Guideline: Fall prevention for older and elderly persons in hospitals and chronic care facilities
Version 01 (January 2009)

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1. Introduction

Awareness of the danger of falls, the consequences for the individual and the lack of scientifically sound guidelines for nursing personnel led the Evidence-Based Nursing Core Team at the LKH—University Hospital in Graz, Austria, to prepare an evidence-based guideline on “Fall prophylaxis for older and elderly persons.” Guidelines are systematically developed aids to decision making with regard to appropriate approaches to special health problems. They suggest modes of action that have a firm practical and scientific basis. (AWMF, ÄZQ 2001) Such guidelines should provide nursing personnel with a route to follow in their decisions and actions, bearing in mind that in special cases it may be desirable or even necessary to depart from the guidelines. (Ollenschläger 2006).

This guideline comprises systematic information on the prevention or reduction of falls by older and elderly people in hospitals and long-term geriatric care (nursing homes, assisted living facilities, geriatric hospitals). Aim of the guideline is, on the basis of the literature, to present the most effective methods of fall prophylaxis and to provide practical advice. Use of this guideline should enable implementation of the results of nursing research in nursing practice.

2. General remarks

Different versions of this guideline are available. This short version is intended to provide the user with a survey of the most important recommendations and so to aid in the planning of appropriate measures. The long version includes a description of the methodology, aims and limits, underlying evidence, detailed information on the recommendations, all the included and excluded studies, references and meta-analyses.

This guideline is available in print and electronic versions, so as to reach the various categories of readers. The electronic versions and detailed information on the authors are available from the EBN homepage, www.ebn.at, at no cost.

3. Classes of evidence and recommendations

Evidence classification (“levels of evidence”) refers to the hierarchical organization of study types according to their methodology. The *GRADE Working Group* system was followed in the classification of evidence and recommendations

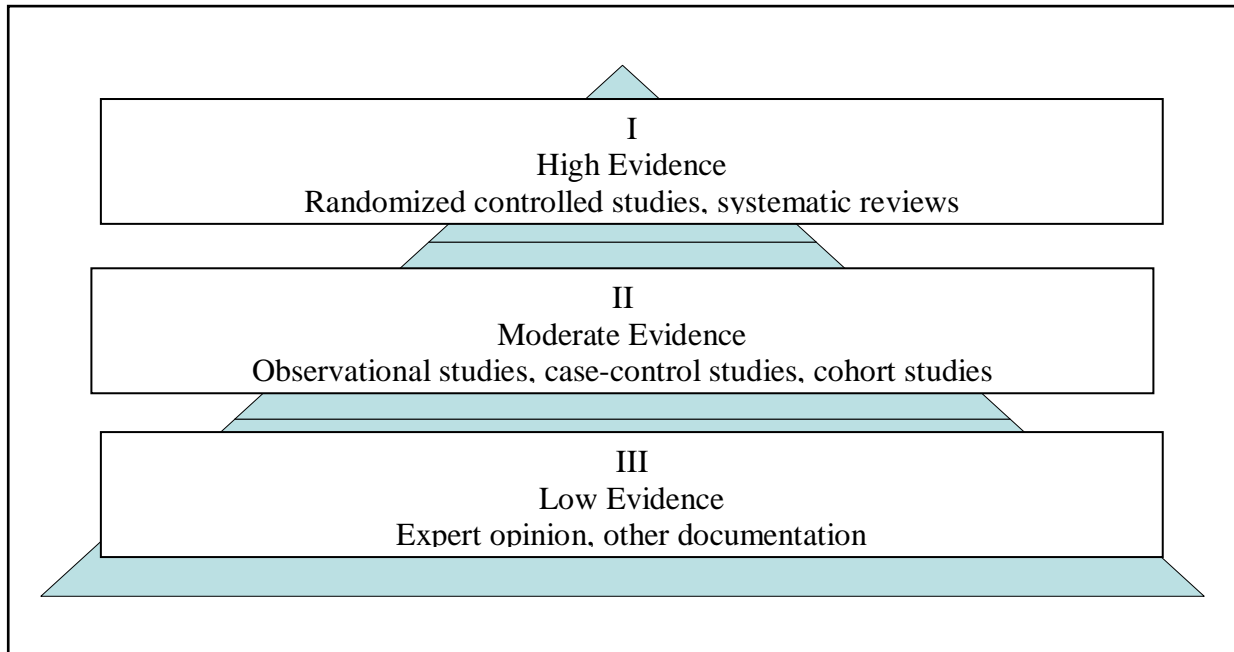


Fig.1: Evidence classification based on the kind of documentation (cf. GRADE Working Group 2004)

These categories are used in the guideline to classify recommendations and are interpreted as follows:




	<p>Do it This measure should be used in nursing practice.</p>
	<p>Do it -- maybe This measure can be used but it may involve risks or additional resources</p>
	<p>Don't do it As this measure entails risks or costs that outweigh its usefulness, it should not be used</p>

Fig.2: Classification of recommendations (cf. GRADE Working Group 2004)

In the decision-making process, it must be borne in mind that nursing decisions always are based on individual cases and that under some circumstances, it can be desirable or even necessary to deviate from the recommendations.

4. Risk factors for falls

Risk factors for falls in hospitals

Factors that are the most common causes of falls in hospitals (Oliver et al. 2004):

- Uncertain gait and/or weakness of the lower extremities
- Urinary incontinence, greater frequency of urination, need for assistance using the toilet
- History of falls
- Agitation and/or confusion, limited judgment
- Prescription drugs that predispose to falls, especially sedatives.

Risk factors for falls in chronic care facilities (*National Ageing Research Institute, Australia 2004*):

Intrinsic fall risk factors

- Very advanced age
- Women: estrogen deficiency, low bone density,
- Acute illness
- History of falls
- Tendency to wander
- Cognitive limitations
- Post-prandial drop in systolic blood pressure
- Diabetes mellitus
- Limitations in performing ADLs
- Decreased strength or balance in the lower extremities
- Unsteady gait; use of walking aids
- Wheelchair use, transfer to/from wheelchair
- Antidepressants, multiple medications
- Visual impairment

Extrinsic faktors in chronic care facilities

- Adaptation to a new setting
- Environmental dangers (excessively low toilets, chairs on casters, problems with wheelchair brakes) and devices intended to aid mobility (walkers, wheelchairs)

5. Assessing fall risk

There are different methods for identifying persons at risk and different levels of assessment instruments (*NICE 2004*):

- Comprehensive assessment instruments
- Multifactorial fall assessment instruments (fall focus assessment)
- Tests to assess disorders of balance and gait



Comprehensive assessment instruments that include factors for fall risk (e.g. MDS–RAI or PAS) or fall focus instruments (STRATIFY or MORSE) should be used for all older and elderly patients in hospitals and care facilities to identify risk patients. Evidence class I.

5.1. Morse Fall Risk Assessment Scale

Risk Factor	Scale	Points	Patient's Score
History of Falls	Yes	25	
	No	0	
Secondary Diagnosis (Two or more medical diagnoses)	Yes	15	
	No	0	
Ambulatory Aid	Furniture	30	
	Crutches/Walker/Cane	15	

	None/Bedrest/Wheelchair/Nurse	0	
IV/Saline Lock	Yes	20	
	No	0	
Gait/Transferal	Impaired	20	
	Weak	10	
	Normal/Bed Rest/ Immobile	0	
Mental Status	Forgets limitations	15	
	Oriented to own ability	0	

Total Score: _____

High Risk = 45 and higher

Moderate Risk = 25-44

Low Risk = 0-24

Fig. 3 Morse Fall Risk Assessment Scale

(From Morse, J. M. (1997). Preventing Patient Falls. Thousand Oaks: Sage.)

5.2. STRATIFY fall risk assessment tool

Item		Wert
1	Recent fall Fall during or within 2 months before hospitalization	1 = yes 0 = no
2	Mental alteration Confusion, disorientation and/or agitation	1 = yes 0 = no
3	Urgency Does the patient need to visit the toilet unusually often? (e.g. frequency, urgency, incontinence)	1 = yes 0 = no
4	Visual impairment Does the patient have functional visual impairment that limits everyday life? ?	1 = yes 0 = no
5	Transfer – walking/wheelchair (Barthel subscale) Item “Transfer” <u>plus</u> item “walking/wheelchair” = 15-20 Punkte?	1 = yes 0 = no
SUM		
Optional	Medication Sedatives, antidepressants and/or opiates/opioides	1 = yes 0 = no

	Punkte
Item transfer - walking/wheelchair = 15-20 points?	1 = yes 0 = no
Transfer from bed to chair or wheelchair	
<ul style="list-style-type: none"> • Completely independently from a lying position into the (wheel)chair and back 	15
<ul style="list-style-type: none"> • Supervision or slight help (untrained layperson) 	10
<ul style="list-style-type: none"> • Considerable help (trained layperson or professional help) 	5
<ul style="list-style-type: none"> • Essentially no transfer from bed 	0
Walking on level ground or wheelchair mobility	
<ul style="list-style-type: none"> • Without supervision or professional help can rise from seated to standing position and walk at least 50 m without walker (if necessary with canes or crutches) 	15
<ul style="list-style-type: none"> • Without supervision or professional help can rise from seated to standing position and walk at least 50 m with a walker 	10
<ul style="list-style-type: none"> • With lay help or walker, can stand up and cover distances in living area, or is completely independent in living area in wheelchair 	5
<ul style="list-style-type: none"> • Does not fulfill previous item (does not earn 5 points) 	0
Sum Barthel subscale	

Fig. 4: STRATIFY Fall Risk Assessment Tool

Scoring: The STRATIFY instrument comprises five or six items. Fall risk is increased if at least two of them are answered “yes.”

5.3. Fall risk assessment as a means of preventing falls



If falls and injuries due to falls are to be reduced, the fall risk assessment must be followed by suitable interventions. This means that measures must be planned for risk patients in accordance with their risk factors. Evidence class I

5.4. Recording falls



Every fall should be documented with a fall protocol. Analysis of fall protocols can be useful in determining extrinsic and intrinsic causes of falls and may allow a patient’s or resident’s “fall pattern” to be recognized. Evidence class III

6. Evidence-based recommendations for fall prophylaxis

6.1. Fall prophylaxis intervention tree

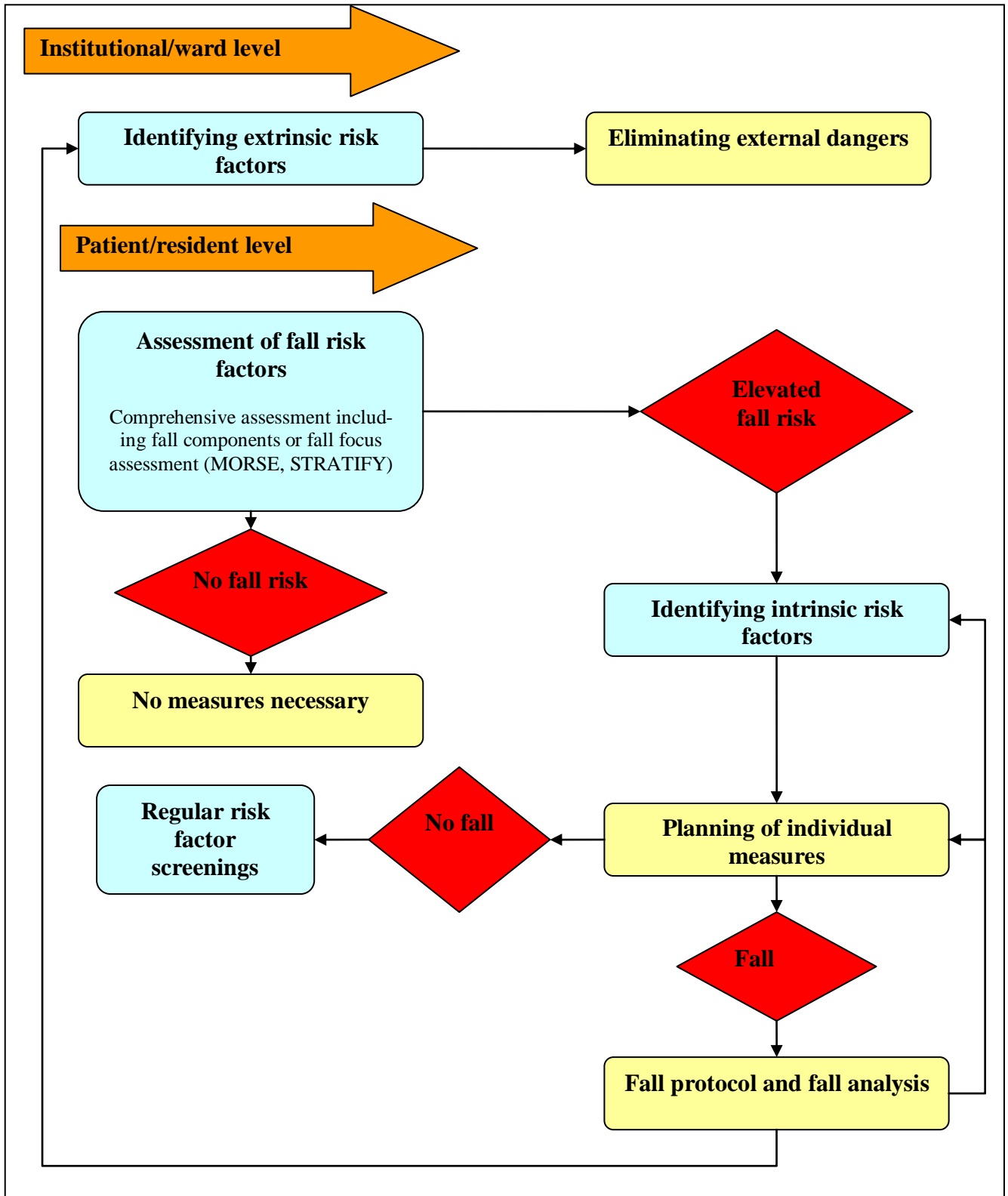


Abb.5: Intervention tree for fall prophylaxis

6.2. Multifactorial intervention program

A multifactorial intervention program is a fall prevention program that takes into account the individual risk factors of a given patient or those of a particular patient group.



A multifactorial intervention program is effective in reducing falls by patients or residents in hospitals and chronic care facilities. All older and elderly persons who have a higher risk of falling should be identified and interventions chosen for them on the basis of their individual risk factors. To make these measures effective, nursing personnel must be aware of the extrinsic and intrinsic risk factors. Evidence class I



The implementation of comprehensive prevention programs must involve the entire care team including physicians, therapists and relatives to provide patients/residents with continuous care. Evidence class III

The following table is an example of possible interventions aimed at individual risk factors. It must always be borne in mind that nursing decisions are always made on an individual basis and interventions must take the individual patient's/resident's capabilities and views into account.

<p style="text-align: center;">Intrinsic risk factors (National Ageing Research Institute, Australia 2004, Oliver 2004)</p>	<p style="text-align: center;">Possible interventions</p>
<ul style="list-style-type: none"> • Advanced age • Multimorbidity 	<ul style="list-style-type: none"> • Motivation for physical activity • Group exercises in chronic care facilities • Training for patients (and relatives when indicated) and/or information on risk factors, potential dangers and prophylactic measures
<p>Limited mobility</p> <ul style="list-style-type: none"> • Unsteady gait • Weakness in the lower extremities • Use of walking aids • Balance problems 	<ul style="list-style-type: none"> • Suitable walking aid • Functionality of walking aids • Suitable footwear • Group exercises in chronic care facilities • Exercises to improve balance
<p>History of multiple falls</p>	<ul style="list-style-type: none"> • Search for cause • Heightened watchfulness (more rounds, chair/bed alarms, sensor mats) • Hip protectors • Training for patients (and relatives when indicated) and/or information on potential dangers, prophylactic measures; behavior after a fall
<p>Need of assistance using the toilet</p> <ul style="list-style-type: none"> • Urinary incontinence • Frequency 	<ul style="list-style-type: none"> • Suitable footwear • Non-skid socks (at night) • Heightened watchfulness
<ul style="list-style-type: none"> • Agitation • Confusion • Dizziness • Poor judgement • Cognitive limitations • Limited orientation 	<ul style="list-style-type: none"> • Heightened watchfulness • Review of medications • Monitoring pulse and blood pressure
<ul style="list-style-type: none"> • Medications that predestine for falls (sedatives, 	<ul style="list-style-type: none"> • Review of medications • Monitoring of pulse and blood pressure

antidepressants) • Multiple medications	
Sensory limitations, e.g. poor vision	<ul style="list-style-type: none"> • See that eyeglasses are worn • Keep lenses of eyeglasses clean • Check visual acuity
Measures that limit freedom	<ul style="list-style-type: none"> • Reduction of measures that limit freedom • Chair/bed alarm, sensor mat • More checks • Review of medications • Hip protectors

Extrinsic risk factors (Evans 2004, Conell 1996 in National Ageing Research Institute, Australia 2004)	Possible Interventions
Poor lighting	Adequate lighting, night light, sensor lights at night
Slippery floors	Dry floors, warning signs when floors are wet
High bed	Adjust bed to lowest possible level
Stumbling blocks on the floor	Take care that no there are no objects lying around on the floor
Unsuitable footwear (mules, slippers)	See that well fitting shoes are worn that provide adequate support, are not too tight, cover the heel and have a non-skid sole

Tab.: Possible interventions to avoid individual risk factors

6.3. Mobility exercises in the hospital



Exercise programs for older and elderly people in the hospital consume time, personnel and financial resources and are not effective in reducing falls or injuries due to falls in the hospital. Evidence class I



Older and elderly patients in the hospital should, in so far as their health allows, be encouraged to be physically active (walking, active mobility exercises in bed...) to prevent loss of mobility and/or function. Evidence class III

6.4. Mobility training in chronic care

6.4.1. Group exercises



Group exercises should be offered at least once a week for approximately one hour for chronic care patients who are at risk of falling. The exercises in the program should aim to improve muscle strength, equilibrium and flexibility. Evidence class I



With group exercise programs, care should be taken to form groups that are as homogeneous as possible and to choose exercises that are geared to the physical and cognitive abilities of the individual participants. There should not be more than eight to ten patients/residents in the group. Evidence class III

6.4.2. Individual exercises



There is no evidence that individual exercise programs are effective for fall reduction. The time and personnel resources required for the implementation of this intervention are further reasons for its non-acceptance. Evidence class I

6.4.3. Balance exercises



Computer-animated balance exercises (20- to 30-minute units with computer feedback) can be used as a fall prevention program for patients who can walk without assistance and have no cognitive disabilities, provided they are interested in using computer programs. A further requirement is the availability of enough PCs at the respective institution. Evidence class II

6.5. Modifications of the environment

Falls by older people in chronic care facilities are the result of complex interactions between personal (intrinsic) factors and environmental factors (Gross et al. 1990 in National Ageing Research Institute, Australia 2004). Risk factors for falls in chronic care facilities include poor **light**, wet or slippery **floors**, uneven walkways, wheelchairs or beds without wheel locks, unsuitable footwear, and **incorrect use of walking aids** (National Ageing Research Institute, Australia 2004).

Note: The law specifies that certain risk factors should not be present in chronic care facilities. According to the Styrian law for nursing homes [§ 2 (3) St-PHVO (Steiermärkische Pflegeheimverordnung – StPHVO 2004)], patients' rooms must, for example, have height adjustable beds, a call button at the bedside and nightlights. Elsewhere [§ 2 (4) St-PHVO], the requirements for sanitary facilities are given. These include, among others:

- Grab bars on both sides of the toilet
- Call button within reach of toilet and shower
- Shower seat
- Handrail
- Barrier-free shower area

6.5.1. Non-skid socks



Patients or residents who often get up at night (e.g. to use the toilet) and who have difficulty putting on shoes, should wear non-skid socks in bed, but under the condition that this is acceptable to the patient. Evidence class II

6.5.2. Safe footwear



Take care that patients/residents wear shoes that fit well, support the foot, are not too tight, cover the heel and have non-skid soles. Evidence class III

6.5.3. Walkers



Walkers should be kept in good repair (check tire pressure, brakes) and adjusted to the respective patient (e.g. height). Personnel and potential users should be instructed in the use of these mobility aids. Evidence class III

6.5.4. Suitable eyewear



Care should be taken that when patients/residents leave their beds they put on their eyeglasses, and that these are always clean.

If a vision problem is suspected, the prescription should be checked and new eyeglasses fitted if necessary. Evidence class III

6.5.5. Wall-to-wall carpet



Replacing vinyl flooring with wall-to-wall carpet is not an effective measure to reduce falls. Evidence class I

6.5.6. Environmental modification combined with a multifactorial fall prevention program



The elimination of extrinsic risk factors for falls is an important component of multifactorial fall prevention programs, both in hospitals and in chronic-care facilities. The following measures should be taken to reduce risk factors:

- Adjust the bed to the lowest level after bedside patient care.

- Keep floors dry (watch out for water sloshed from the mop bucket, spilled drinks, urine...).
- Draw attention to wet floors with warning signs.
- Make sure that there are no objects lying around on the floor.

Evidence class I

6.5.7. Restrictive measures



Restrictive measures are not suitable for fall prophylaxis and can actually increase the danger of injury resulting from falls. Evidence class I

6.6. Training

6.6.1. Training for residents/patients, information for relatives



Patients/residents with a risk profile for falls and their relatives should be informed of this risk, and of what they can do themselves to reduce it. Information for patients/residents should include the following:

- Strategies for fall avoidance (suitable footwear, acceptance of help when getting out of bed, suitable lighting, wearing eyeglasses)
- Explanation of possible causes of falls (extrinsic and intrinsic risk factors)
- What to do in the case of a fall

These measures do, however, require that the patient/resident have the cognitive ability to comprehend the information given. Evidence class III

6.6.2. Training for personnel



Specific training in hospitals and chronic care facilities is recommended to increase staff awareness of the subject of falls and to recognize the extent of the problem in their facility. Training programs should include information on fall risk factors, as well as suitable measures to identify patients with a high risk profile, and to develop effective strategies for

fall prevention. Besides information on safety aspects (eliminating risk factors), it is important to provide information on transfer techniques.

Drawing staff into the development and implementation of fall prevention programs can have a positive effect on the success of training sessions. Evidence class II

6.6.3. Information folders



Folders on fall prevention can be helpful for explaining the situation to patients/residents and relatives. Preparing and distributing informative material does, however, make demands upon financial and personnel resources. Evidence class III

6.6.4. Training programs as part of a multifactorial fall prevention program



Training sessions for personnel can be effective for fall prophylaxis when they are a component part of a comprehensive fall prevention program. Evidence class I

6.7. Medication review



Elderly people who are at risk of falls in the hospital and who take medications regularly should have their medication reviewed by their physician and, if feasible, have dosages reduced to lessen the likelihood of falls. These measures are not cost intensive from the point of view of time and personnel and help to reduce the costs of medication. Evidence class II



It is true for chronic care facilities as well that medication review by a physician requires little time and effort, and that selective consumption of medications will provide the patient with more benefit than harm. Evidence class I

6.8. Incontinence management in combination with physical exercises



As there is no strong supporting evidence for this measure and the nursing effort (help with going to the toilet, physical exercises, toilet training) is considerable, this intervention cannot be recommended. Evidence class I

6.9. Checking pulse



Patients should be encouraged to tell nursing personnel whenever they feel weak or dizzy. Hospital patients who are known to have low blood pressure or who have just had surgery should be mobilized slowly (they should sit up slowly, stand up and wait before starting to walk). Evidence class II

6.10. Heightened watchfulness

6.10.1. More frequent checks



Patients with a history of falls should be checked more frequently. Older and elderly people who tend to be disoriented in the morning should be offered help going to the bathroom in the morning. Evidence class II



If falls show a pattern, patients should be checked more often at these times. This makes for efficient use of staff time. Evidence class III

6.10.2. Bed, chair and mat alarms



Bed, chair or mat alarms can be helpful for patients who are prone to falls, but staff must be immediately available when an alarm goes off. Due to material costs, this measure should only be used in individual high risk cases.

6.10.3. “Sitters”

Sitters are persons (relatives, friends, volunteers) who watch patients with very high risk of falls and offer or get help as necessary.



Patients or residents who are constantly watched may feel limited in their personal freedom. Visitors or relatives must, however, be made aware of the patient’s or resident’s risk of falling and should be told to get help when necessary, e.g. for mobilization, transfer, walking exercises. Evidence class III

6.10.4. Location of the patient’s room



In certain cases, it can make sense to put fall risk patients in rooms near the nursing station. Changing patients’ rooms does, however, require some effort and may not be unproblematic in view of the patient’s own wishes. Evidence class III

6.11. Hip protectors

6.11.1. Hip protectors to reduce falls



Hip protectors are not an effective means of reducing falls. Evidence class I

6.11.2. Hip protectors to prevent hip fractures



If falls cannot be effectively prevented, hip protectors can help to avoid fractures and should be offered to patients/residents in hospitals and chronic care facilities. Evidence class I



If nursing personnel have a positive attitude toward hip protectors and are well informed as to their proper use, patients/residents will be more likely to accept and wear them. Evidence class II

7. How to use this guideline

In the gradation of the recommendations in this guideline, care was taken that the implementation of the recommended interventions not involve additional resources. According to the law (Styrian Chronic Care Home Law, Steiermärkisches Pflegeheimgesetz), certain risk factors should not be present (missing handrails, poor lighting). Elimination of these risk factors so cannot be deemed to involve additional resources.

The recommendations in this guideline can, however, involve changes in the normal organization of health care in a facility. Such changes shift the focus from treatment to prevention and risk identification and can affect structures or personnel.

8. Evaluation and continuation

This guideline will be evaluated with regard to its usefulness and effectiveness. This should assure that the aim of securing and optimizing care quality is met.

A revised version of the guideline will appear in February, 2012. This means that this guideline will expire in February 2012 and cannot be reliably used after that date.

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