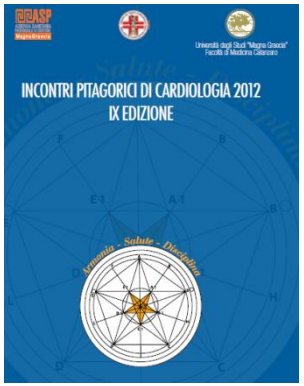

Cadute e sincopi nell'anziano

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Presidio Ospedaliero di Ricerca di Cosenza

- Epidemiologia e cause
- Strategie di assessment
- Problemi specifici dei pazienti anziani

- Epidemiologia e cause
- Strategie di assessment
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An approach to the evaluation and management of syncope in adults

Cite this as: *BMJ* 2010;340:c880
doi: 10.1136/bmj.c880

Steve W Parry, Maw Pin Tan

"Collapse query cause": did my patient have syncope?

Patients with transient loss of consciousness often present non-specifically with an episode of collapse. The most common cause of such a presentation is syncope—rapid onset loss of consciousness of short duration as a result of global cerebral hypoperfusion with loss of postural tone, which is followed by spontaneous and complete recovery.[3 4] A syncopal episode typically lasts around 20-30 seconds and almost invariably less than five minutes, although more prolonged episodes are occasionally recorded.[w6]

Definitions of falls and syncope

Box 1
Traditional definitions of falls and syncope

Fall: An event whereby an individual unexpectedly comes to rest on the ground or another lower level without known loss of consciousness.[21]

Syncope: A transient loss of consciousness due to transient global cerebral hypoperfusion characterized by rapid onset, short duration, and spontaneous complete recovery.[22]

Cronin et al, Clin Geriatr Med 2010

European Heart Journal (2009) **30**, 2631–2671
doi:10.1093/eurheartj/ehp298

Guidelines for the diagnosis and management of syncope (version 2009)

The Task Force for the Diagnosis and Management of Syncope of the European Society of Cardiology (ESC)

Table 3 Conditions incorrectly diagnosed as syncope

Disorders with partial or complete LOC but without global cerebral hypoperfusion

- Epilepsy
- Metabolic disorders including hypoglycaemia, hypoxia, hyperventilation with hypocapnia
- Intoxication
- Vertebrobasilar TIA

Disorders without impairment of consciousness

- Cataplexy
- Drop attacks
- Falls
- Functional (psychogenic pseudosyncope)
- TIA of carotid origin

LOC = loss of consciousness; TIA = transient ischaemic attack.

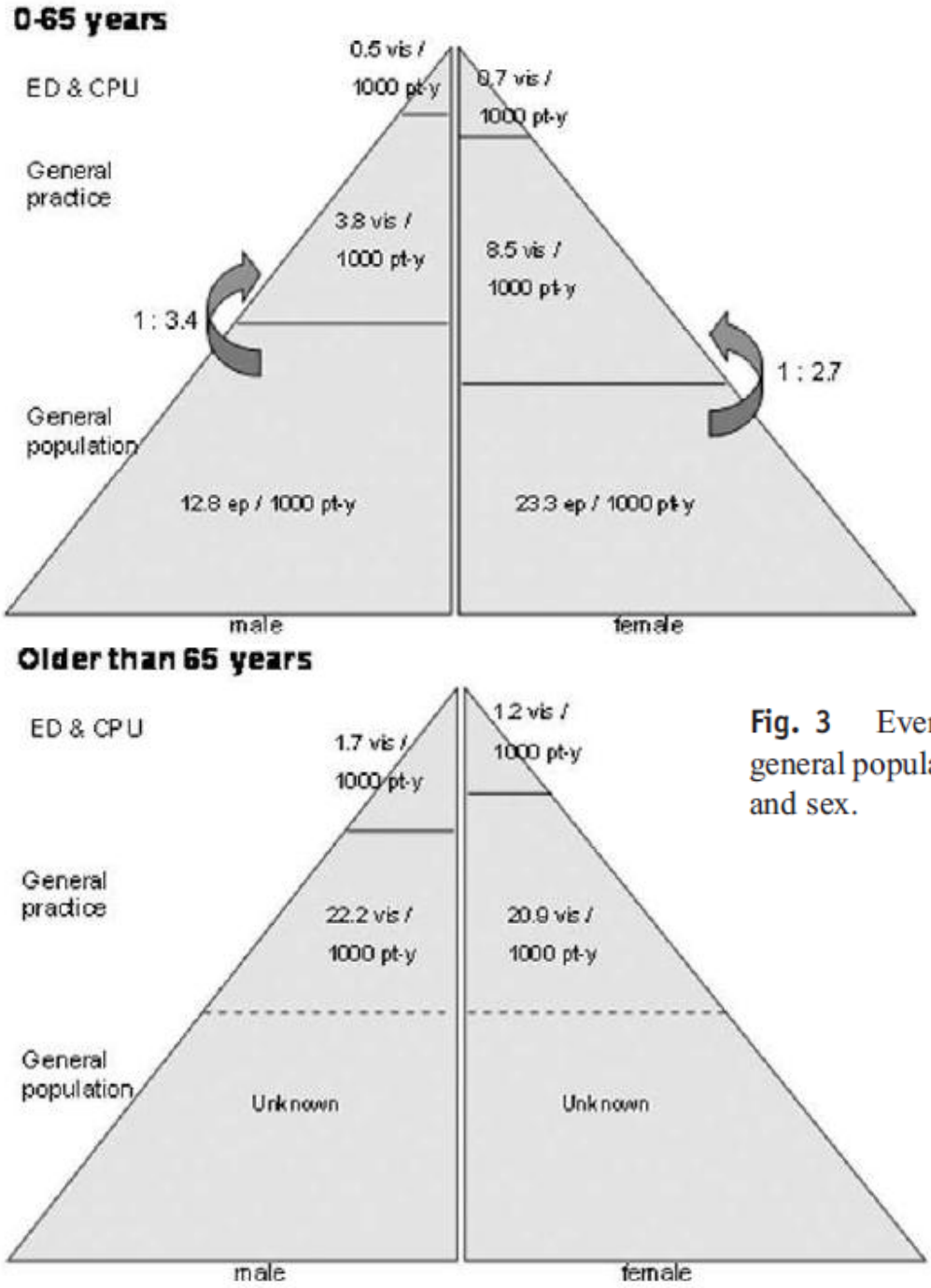

Fig. 3 Event and visitation rates per 1000 person-years in the general population, general practice, and emergency settings by age and sex.

Olde Nordkamp et al, Am J Emerg Med 2009

European Heart Journal (2009) **30**, 2631–2671
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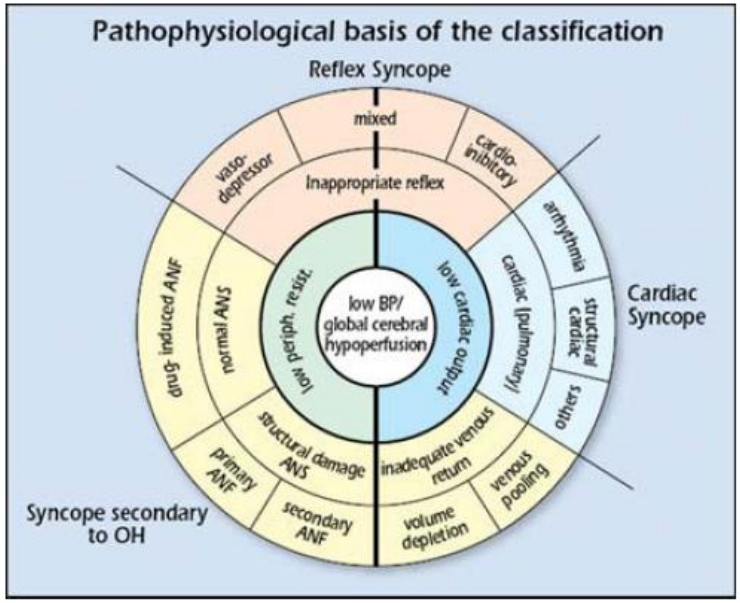

Figure 2 Pathophysiological basis of the classification (see text). ANF = autonomic nervous failure; ANS = autonomic nervous system; BP = blood pressure; low periph. resist. = low peripheral resistance; OH = orthostatic hypotension.

- Reflex syncope is the most frequent cause of syncope in any setting.
- Syncope secondary to cardiovascular disease is the second most common cause. The number of patients with a cardiovascular cause varies widely between studies; higher frequencies are observed in emergency settings mainly in older subjects, and in settings oriented toward cardiology.
- In patients <40 years OH is a rare cause of syncope; OH is frequent in very old patients.
- Non-syncopal conditions, misdiagnosed as syncope at initial evaluation, are more frequent in emergency referrals and reflect the multifactorial complexity of these patients.
- The high unexplained syncope rate in all settings justifies new strategies for evaluation and diagnosis.

An approach to the evaluation and management of syncope in adults

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Steve W Parry, Maw Pin Tan

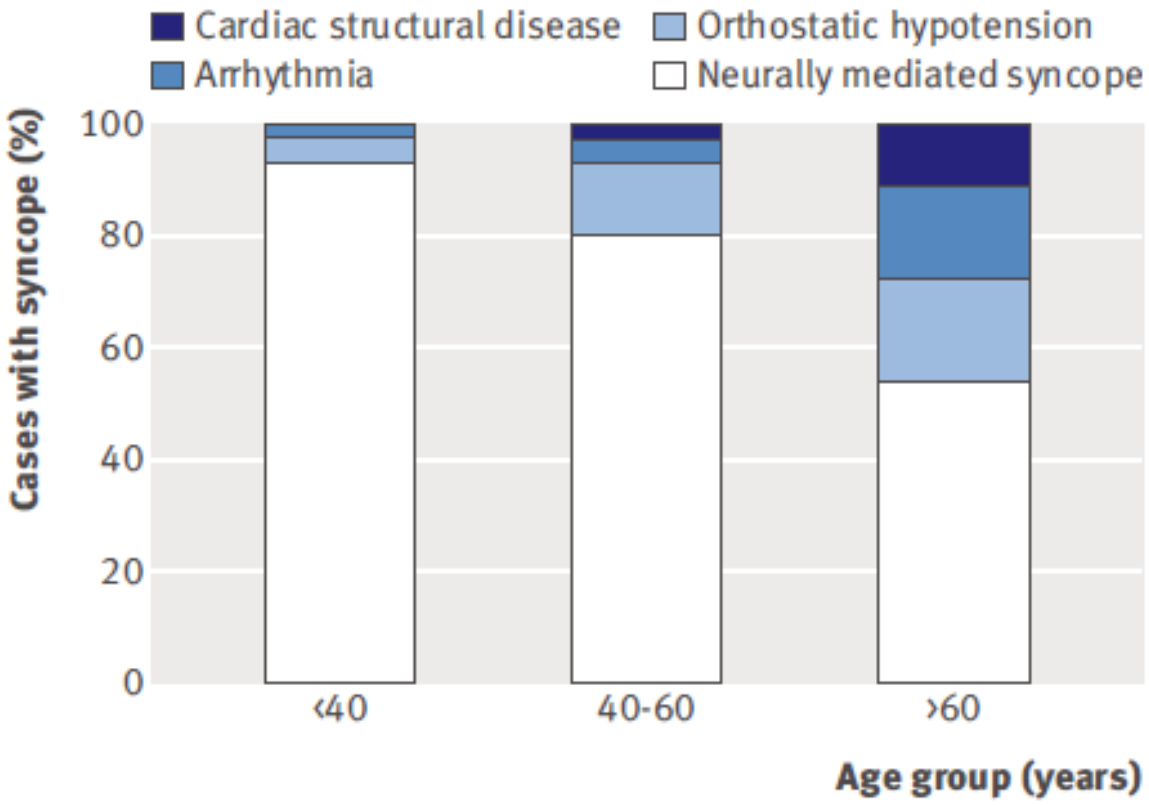


Fig 1 | Causes of syncope by age

Diagnosis and Characteristics of Syncope in Older Patients Referred to Geriatric Departments

Andrea Ungar, MD, PhD,[*†] *Chiara Mussi, MD, PhD,*[‡] *Attilio Del Rosso, MD,*[§] *Gabriele Noro, MD,*[‖] *Pasquale Abete, MD, PhD,*[¶] *Loredana Ghirelli, MD,*[#] *Tommaso Cellai, MD,*[*†] *Annalisa Landi, MD,*[*†] *Gianfranco Salvioli, MD,*[‡] *Franco Rengo, MD,*[¶] *Niccolò Marchionni, MD,*[*†] *and Giulio Masotti, MD,*[*†] *for the Italian Group for the Study of Syncope in the Elderly*

JAGS 54:1531–1536, 2006

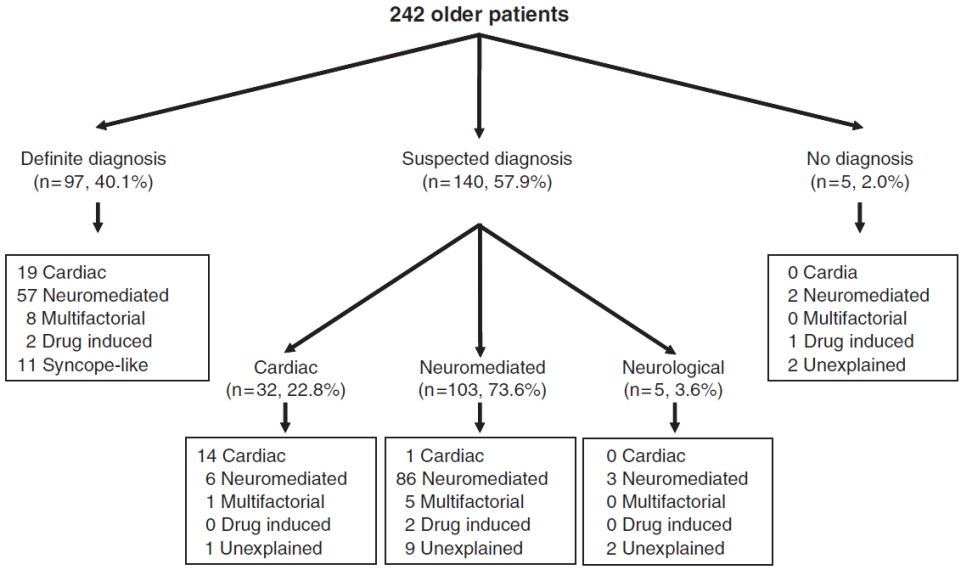
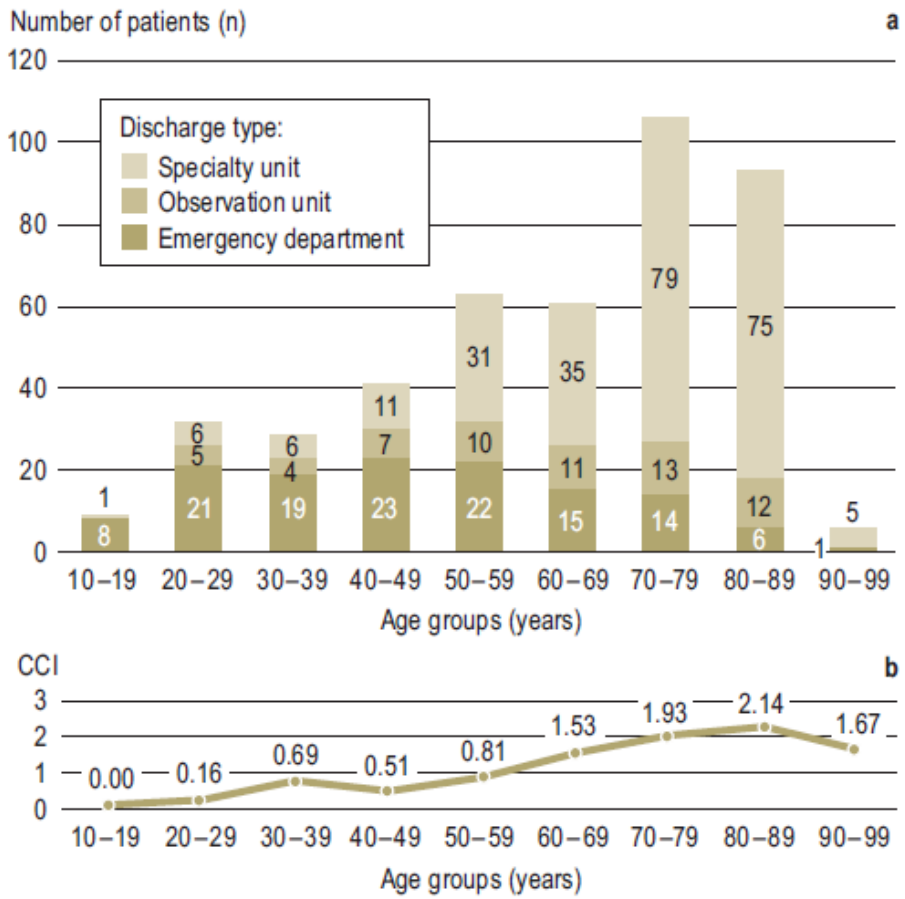


Table 4. Causes of Syncope in the Whole Series and by Age Group

	All (N = 231)	65–74 (n = 71)	≥75 (n = 160)	
Etiology of Syncope		n (%)		*P*-value*
Cardiac	34 (14.7)	8 (11.3)	26 (16.3)	.06
Neuroreflex	102 (44.1)	44 (62)	58 (36.3)	<.001
Orthostatic	52 (22.5)	3 (4.2)	49 (30.5)	<.001
Drug-induced	11 (4.8)	3 (4.2)	8 (5)	.33
Multifactorial	8 (3.5)	3 (4.2)	5 (3.1)	.21
Unexplained	24 (10.4)	10 (14.1)	14 (8.8)	.10

* *P*-value for difference between age groups, chi-square.

FIGURE 1



Age-dependent distribution of patients with syncope

a) Patients with syncope according to age group and indicating the type of care (inpatient care in a speciality unit, inpatient care in the ED observation unit, or discharge from the emergency department (ED) for outpatient follow-up care).

b) Patients discharged against medical advice (n = 38) are represented here according to discharge from the ED. Comorbidities (according to the Charlson Comorbidity Index, CCI) are shown according to the different age groups.

Guldner S Dtsch Arztebl Int 2012

The personal and health service impact of falls: the Newcastle 85+ cohort study

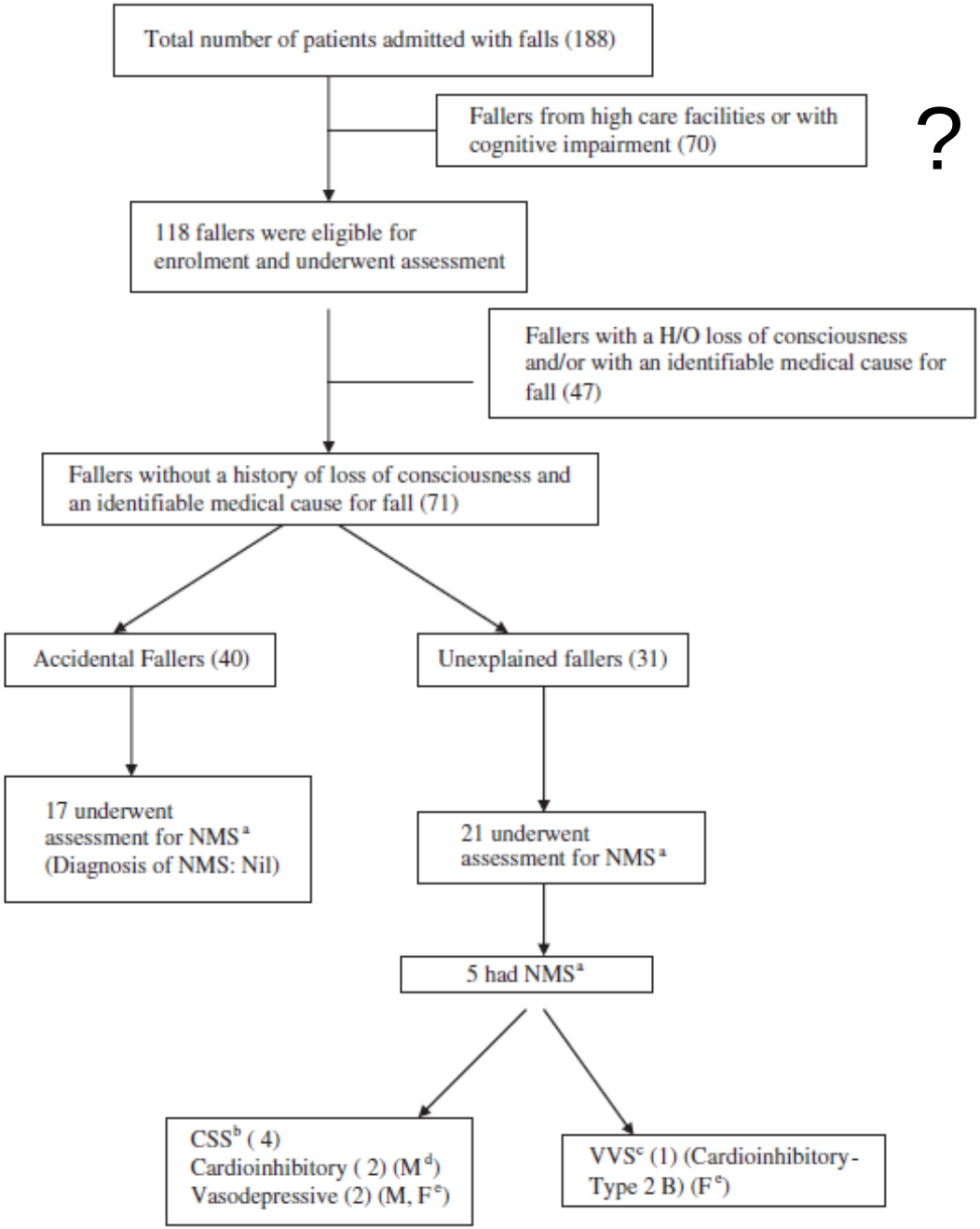
Table 3. Health service use and 12 month cost of falls.

	FALL-RELATED SERVICE USE		FALL-RELATED COSTS			
Service	**%(n) of 'all' participants (fallers and non-fallers) in receipt of service due to fall (N = 816)**	**%(n) of fallers in receipt of service due to fall (N = 313)**	**National average unit cost (lower-upper quartile)* (£†)**	**Average cost per participant (fallers and non-fallers) (N = 816) (£†)**	**Average cost per faller (N = 313) (£†)**	**Average cost per fall (F = 580) (£†)**
Accident and Emergency§	12 (94)	30 (94)	280‡ (241–319)	51 (44–58)	132 (114–151)	65 (56–74)
Hospital admission§	5 (40)	13 (40)	205 (174–246)	12 (10–15)	32 (27–39)	23 (20–28)
Falls specialist outpatient¶	5 (39)	12 (39)	154 (114–190)	7 (5–9)	19 (14–24)	10 (7–12)
General practitioner consultation¶	14 (115)	37 (115)	50#	7#	18#	11#
Total	**100 (816)**	**100 (313)**		**78 (67–89)**	**202 (174–231)**	**109 (94–125)**

*Sources: Curtis LA (2007) Unit Costs of Health and Social Care 2007. Personal Social Services Research Unit, University of Kent, Canterbury, UK and Newton JL, Kyle P, Liversidge P, Robinson G, Wilton K, et al. (2006) The costs of falls in the community to the North East Ambulance Service. Emerg Med J 23: 479–481.
†Rounded to nearest pound sterling. Conversion rates (Aug 2011): £1 = US$1.63, £1 = €1.13.
‡Includes the estimated cost of emergency ambulance use estimated from the average cost of a fall to the regional ambulance service in 2004 (Newton et al. 2006) adjusted for inflation (5% per annum). Lower and upper quartile estimated on basis of Accident and Emergency quartiles (0.86–1.14).
§Service use in previous 12 months due to fall.
¶Service use 'ever' due to fall.
#Lower and upper quartile not available.

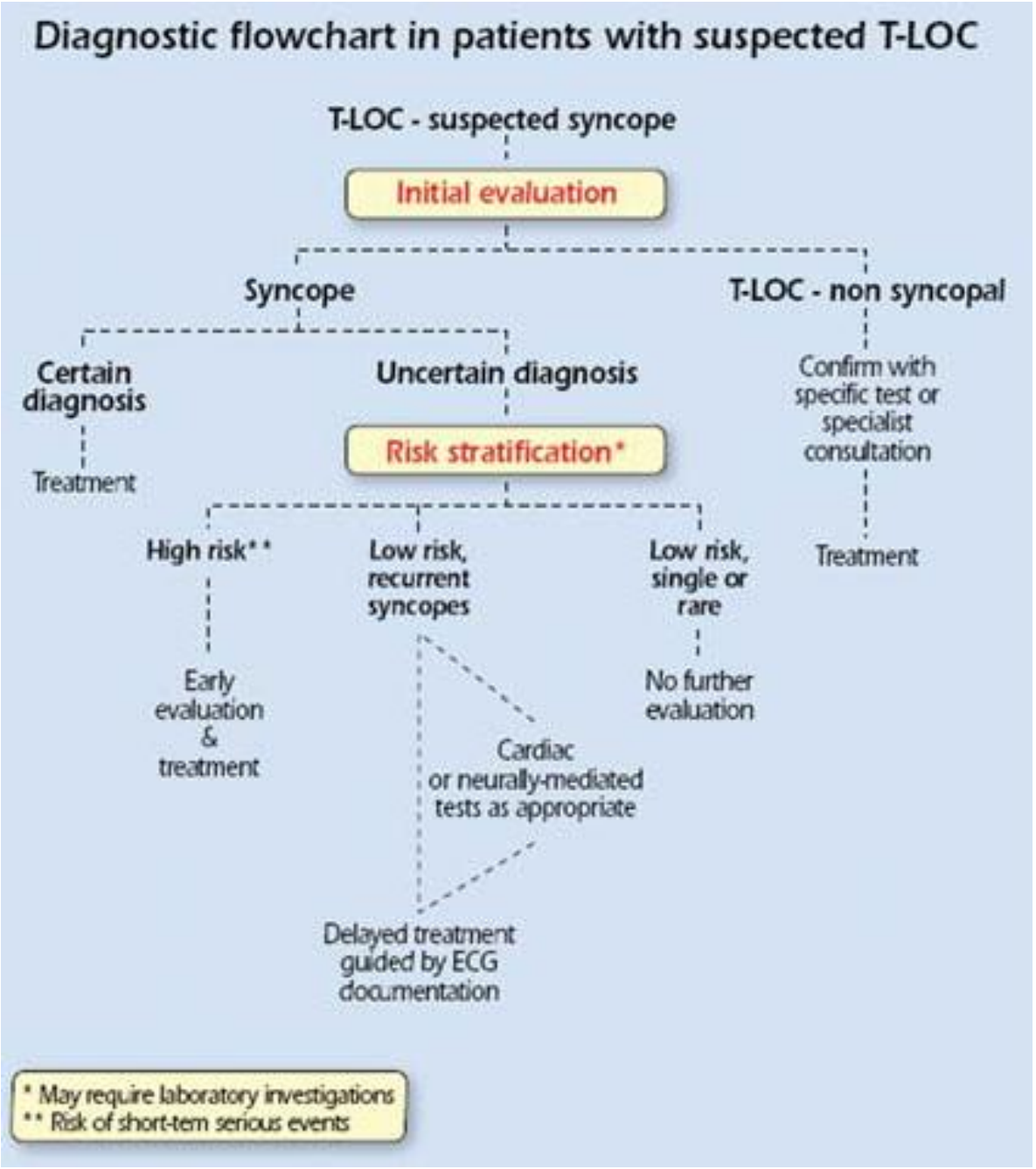
Collerton et al Plos One 2012

The prevalence of neurally mediated syncope in older patients presenting with unexplained falls



Anpalahan & Gibson Eur J Intern Med 2012

- Epidemiologia e cause
- Strategie di assessment
- Problemi specifici dei pazienti anziani



ESC guidelines, 2009

The Emergency Department Approach to Syncope: Evidence-based Guidelines and Prediction Rules

Chad Kessler, MD[a,b,c,d,*], Jenny M. Tristano, MD[e], Robert De Lorenzo, MD, MSM[f,g]

Emerg Med Clin N Am 28 (2010) 487–500
doi:10.1016/j.emc.2010.03.014
0733-8627/10/$ – see front matter. Published by Elsevier Inc.
emed.thedinics.com

Table 1
Commonalities of Syncope Risk Stratification Rules[a]

Risk Stratification of Patients with Syncope (Martin et al[2])[a]	OESIL Risk Score (Colivicchi et al[33])[a]	Derivation of the SFSR (Quinn et al[36])[b]	Boston Syncope Criteria (Grossman et al[44])[c]	EGSYS scoring system (Del Rosso et al[45])[d]	
				Risk Factor	Points
Abnormal ECG	Abnormal ECG	Congestive heart failure history	Signs and Symptoms of Acute Coronary Syndrome	Palpitations preceding syncope	+ 4
Age >45years	Age >65years	Hematocrit < 30%	Signs of Conduction Disease	Heart Disease and/or abnormal ECG	+ 3
History of Ventricular Arrhythmia	Cardiovascular disease in clinical history	Abnormal ECG	Worrisome Cardiac History	Syncope during effort	+ 3
History of CHF	Syncope without prodrome	Shortness of Breath	Valvular heart disease by history or by physical exam	Syncope while supine	+ 2
		Systolic Blood Pressure <90 mmHg at triage	Family history of sudden death	Presence of Precipitating and/or predisposing factors	-1
			Persistent abnormal vital signs in the ED	Presence of Autonomic Prodromes	-1
			Volume depletion such as persistent dehydration, GI bleeding, or hematocrit<30		
			Primary CNS event		

ECG
Age
Past Med Hx
Phys Exam findings
Labs
HPI/symptoms

[a] Increasing number of risk factors indicates increased risk of mortality.
[b] The presence of any one of these risk factors signifies patient is high risk.
[c] Patients considered at risk for serious outcomes if they fall into one of the 8 symptom categories.
[d] A total point score greater than or equal to 3 is considered an indicator that admission is required.

Clinical predictors of cardiac syncope at initial evaluation in patients referred urgently to a general hospital: the EGSYS score

A Del Rosso,[1] A Ungar,[2] R Maggi,[3] F Giada,[4] N R Petix,[1] T De Santo,[5] C Menozzi,[6] M Brignole[3]

Heart 2008;**94**:1620–1626. doi:10.1136/hrt.2008.143123

Table 4 Predictors of cardiac cause of syncope on multivariable analysis and point scores for the diagnosis of cardiac syncope

Variable	p Value	OR (95% CI)	Regression coefficient	Score
Palpitations preceding syncope	<0.001	64.8 (8.9 to 469.8)	4.2	4
Heart disease or abnormal ECG, or both	<0.001	11.8 (7.7 to 42.3)	2.9	3
Syncope during effort	<0.001	17.0 (4.1 to 72.2)	2.8	3
Syncope while supine	0.007	7.6 (1.7 to 33.0)	2.0	2
Precipitating or predisposing factors, or both*	0.01	0.3 (0.1 to 0.8)	−1.1	−1
Autonomic prodromes†	0.02	0.4 (0.2 to 0.9)	0.8	−1

*Warm-crowded place/prolonged orthostasis/fear–pain–emotion; †nausea/vomiting.

Clinical predictors of cardiac syncope at initial evaluation in patients referred urgently to a general hospital: the EGSYS score

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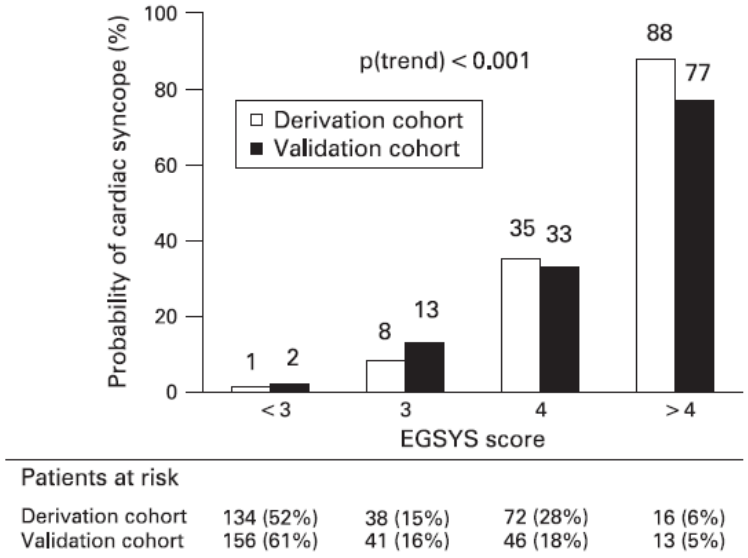

Figure 2 Probability of cardiac syncope according to the EGSYS score in the derivation and validation cohorts.

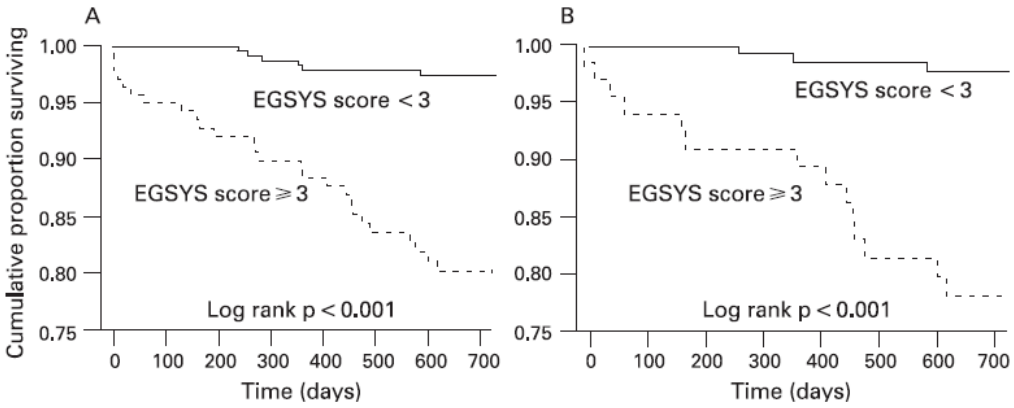

Figure 4 Kaplan–Meier survival curves according to the score at presentation in the derivation (A) and validation (B) cohorts.

Clinical predictors of cardiac syncope at initial evaluation in patients referred urgently to a general hospital: the EGSYS score

A Del Rosso,[1] A Ungar,[2] R Maggi,[3] F Giada,[4] N R Petix,[1] T De Santo,[5] C Menozzi,[6] M Brignole[3]

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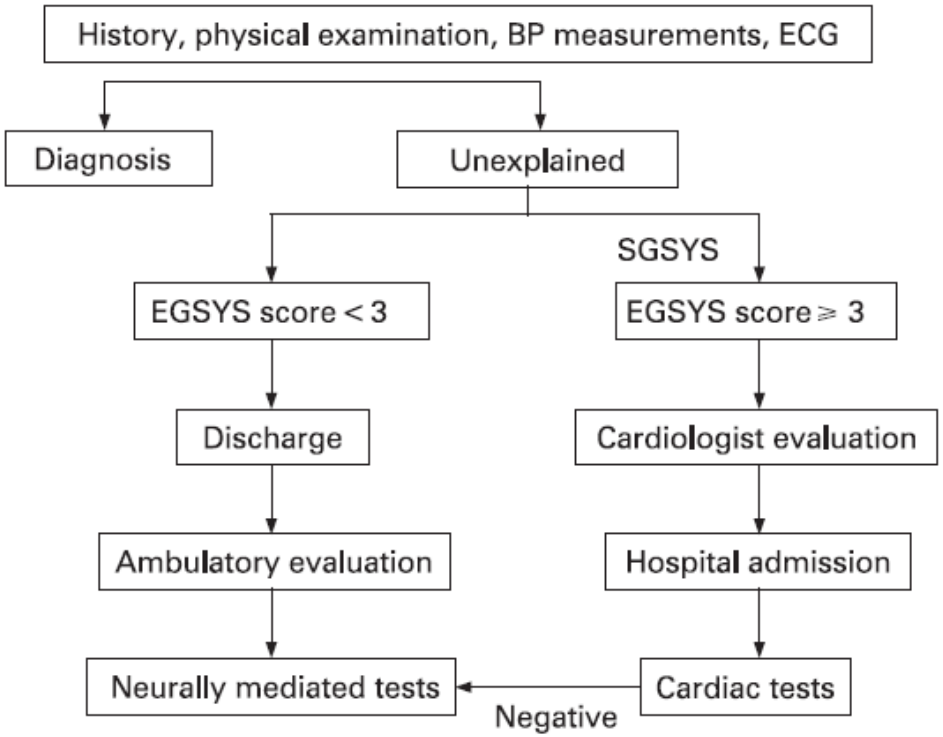


Figure 5 A proposed flow diagram for the evaluation of patients with syncope referred to an Emergency Department. The EGSYS score can be used to select high-risk patients requiring hospitalisation and cardiac evaluation.

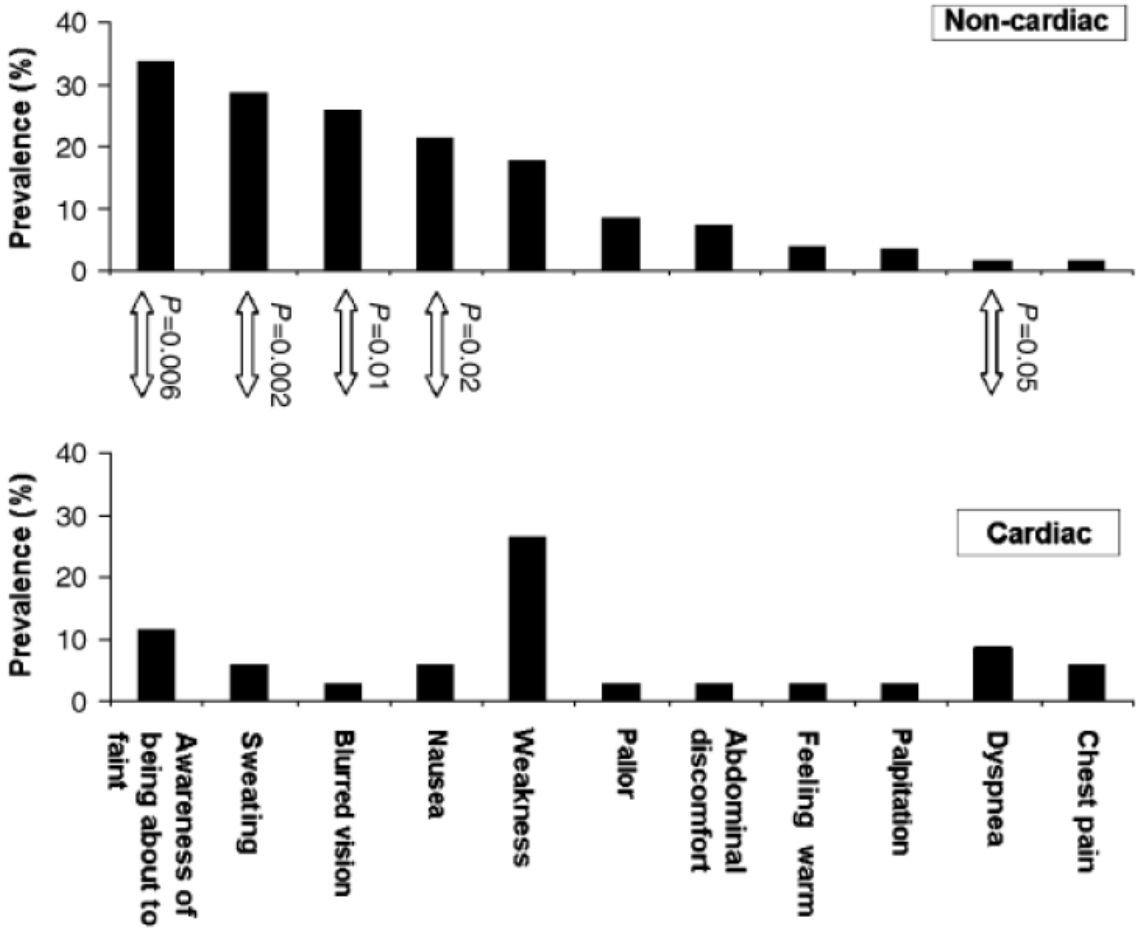
The relevance of symptoms

Table 13 The value of history for distinguishing seizure from syncope (adapted from Hoefnagels *et al.*[5])

Clinical findings that suggest the diagnosis		
	Seizure likely	**Syncope likely**
Symptoms before the event	Aura (such as funny smell)	Nausea, vomiting, abdominal discomfort, feeling of cold sweating (neurally mediated) Lightheadedness, blurring of vision
Findings during loss of consciousness (as observed by an eyewitness)	Tonic–clonic movements are usually prolonged and their onset coincides with loss of consciousness Hemilateral clonic movement Clear automatisms such as chewing or lip smacking or frothing at the mouth (partial seizure) Tongue biting Blue face	Tonic–clonic movements are always of short duration (<15 s) and they start after the loss of consciousness
Symptoms after the event	Prolonged confusion Aching muscles	Usually of short duration Nausea, vomiting, pallor (neurally mediated)
Other clinical findings of less value for suspecting seizure (low specificity)		
Family history		
Timing of the event (night)		
'Pins and needles' before the event		
Incontinence after the event		
Injury after the event		
Headache after the event		
Sleepy after the event		
Nausea and abdominal discomfort		

ESC guidelines, 2009

The relevance of symptoms



Galizia et al, JAGS 2009

Fall assessment in older people

Table 1| **Examples of validated tests and tools available for screening and assessment of fall risk**

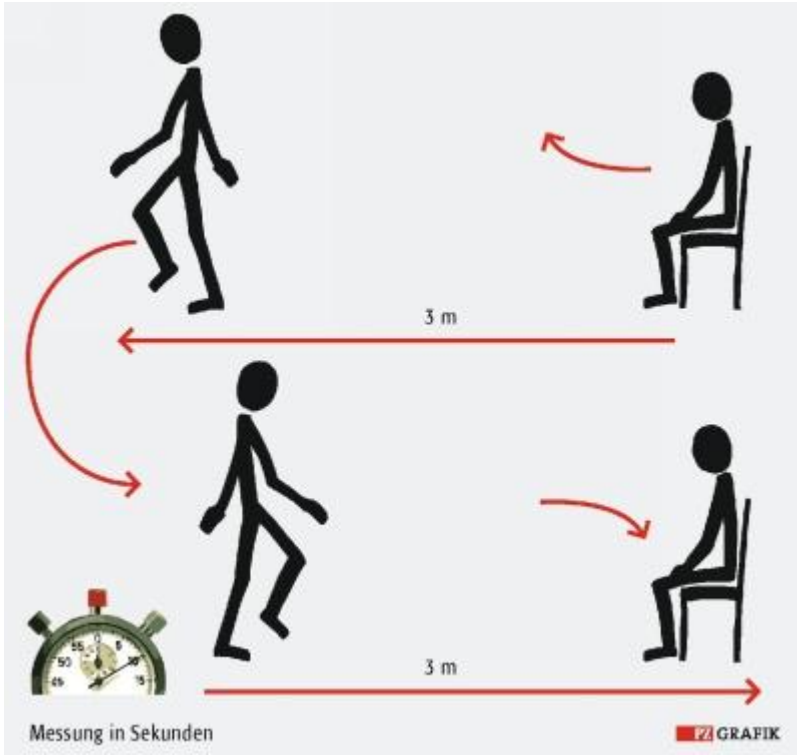
Test and criteria	Practical aspects
Screening in the community: timed up and go test[10-12]	
Description	This test measures the time taken for a person to rise from a chair, walk 3 m at normal pace with their usual assistive device, turn, return to the chair, and sit down
Criterion	A time of ≥12 seconds indicates increased risk of falling
Time to undertake test	1-2 minutes
Equipment	Chair and stopwatch or minute hand on watch
Assessment in the community: QuickScreen[13]	
Description	QuickScreen is a risk assessment tool designed for use by practice and rural nurses, allied health workers, and general practitioners. It allows the clinician to estimate the level of increased fall risk and determine which sensorimotor systems are impaired. The test measures previous falls, drug use, vision, peripheral sensation, lower limb strength, balance, and coordination
Criterion	A score of 4 or more indicates an increased risk of falling
Time to undertake test	10 minutes
Equipment	A low contrast eye chart, a filament for measuring touch sensation, and a small step
Screening in the emergency department: Prevention of Falls in the Elderly Trial[9]	
Description	Used in people presenting to the emergency department after a fall. Three simple questions identify people at increased risk of further falls: (1) Have you had any other falls over the past 12 months? (2) Have you fallen indoors? (3) Have you been unable to get up after a fall?
Criterion	If the patient answers yes to any of the questions further assessment and intervention are needed
Time to undertake test	1-2 minutes
Equipment	None
Screening in hospital: modified STRATIFY[14]	
Description	Six item weighted questionnaire with questions relating to falls, cognition, transfer and mobility skills, vision, and toileting practice
Criterion	A score of ≥9 identifies high risk fallers
Time to undertake test	1-2 minutes
Equipment	None
Screening in nursing and residential care: residential aged care falls screen[15]	
Description	Clinical algorithm based on the person's ability to stand unaided, previous falls, drug use, and continence status
Criterion	Depending on risk factors identified, outcome will be either high or low risk of falls
Time to undertake test	1-2 minutes
Equipment	Medium density 15 cm thick foam mat

STRATIFY=St Thomas' risk assessment tool.

Close & Lord BMJ 2011

Fall risk assessment

Timed up and go test



STRATIFY risk assessment

- Abbreviated mental test score (cognitive impairment)
- Barthel index (disability)
- Albert's test (visual neglect)
- Rivermead mobility index (mobility)

Fall assessment in older people

Table 2| **Examples of linking assessment to evidence based interventions2**

Risk factor	Assessment	Intervention
Impaired balance and mobility	QuickScreen, short physical performance battery, physiological profile assessment, Berg balance scale, and performance oriented mobility assessment	Consider home or group based strength and balance training programme; ensure that any underlying cause for impaired balance and mobility, such as vitamin D deficiency, vitamin B-12 deficiency, use of central nervous system drugs, and pain, is dealt with if possible
Impaired vision	Snellen eye chart; Melbourne edge test; review spectacles; check for evidence of cataracts	If cataracts are impairing vision, refer for extraction; if the patient is using bifocal or multifocal glasses, recommend a separate pair of single lens glasses for use outdoors
Syncope or dizziness	Lying and standing blood pressure measurements; Holter monitoring and carotid sinus massage; Dix-Hallpike test	Review any drugs that might contribute to orthostatic hypotension; consider insertion of a pacemaker for prolonged periods of asystole; consider Epley manoeuvre if dizziness is thought to be related to benign paroxysmal positional vertigo
Feet and footwear	Foot pain and deformity	Treat pain and consider referral to podiatrist and provision of ankle strengthening and mobility exercises
Drug use	Drug review	Stop any drugs that affect the central nervous system unless there is an ongoing clinical indication; ensure calcium and vitamin D intake are sufficient and if not consider supplementation
Environment	Home assessment by an occupational therapist in people identified at high risk of falls	Modification of the home environment with provision of support and advice on safety within and outside the home
Cognition	Mini mental state examination with additional measures of cognition if indicated	Consider the effect of any cognitive deficits on the ability to engage in an intervention

Close & Lord BMJ 2011

- Epidemiologia e cause
- Strategie di assessment
- Problemi specifici dei pazienti anziani

La complessità

European Heart Journal (2009) **30**, 2631–2671
doi:10.1093/eurheartj/ehp298

Guidelines for the diagnosis and management of syncope (version 2009)

The Task Force for the Diagnosis and Management of Syncope of the European Society of Cardiology (ESC)

Some important aspects of diagnostic testing and use of devices in older patients are illustrated:

- OH is not always reproducible in older adults (particularly medication- and age-related). Therefore, orthostatic BP appraisal should be repeated, preferably in the morning and/or promptly after syncope.
- CSM is particularly important to use even if non-specific CSH is frequent without history of syncope.
- In evaluation of reflex syncope in older patients, tilt testing is well tolerated and safe, with positivity rates similar to those observed in younger patients, particularly after nitroglycerine challenge.
- Twenty-four hour ambulatory BP recordings may be helpful if instability of BP is suspected (e.g. medication or post-prandial).
- Due to the high frequency of arrhythmias, an ILR may be especially useful in the elderly with unexplained syncope.[108,119,120]

Evaluation of the frail elderly

Being old is not a contraindication to assessment and treatment. However, in frail patients, the rigour of assessment will depend on compliance with tests and on prognosis. Evaluation of mobile, independent, cognitively normal older adults must be performed as for younger individuals.

Orthostatic BP measurements, CSM, and tilt testing are well tolerated, even in the frail elderly with cognitive impairment.

Multiple risk factors are more common in the frail elderly and distinguishing falls from syncope may be difficult. In one recent study, symptomatic elderly patients with cognitive impairment had a median of five risk factors for syncope or falls.[57] There is some evidence that modification of cardiovascular risk factors for falls/syncope reduces the incidence of subsequent events in community-dwelling frail elderly, even in those with dementia, but not in institutionalized elderly.[201] The influence of hypotension or arrhythmia on cognitive decline in patients with dementia remains unknown.[58]

Postgrad Med J 1997; **73**: 635–639 © The Fellowship of Postgraduate Medicine, 1997

Medicine in the elderly

The overlap between syncope and falls in the elderly

FE Shaw, RA Kenny

Unreliability of history of syncope and falls in the elderly

- 32% of cognitively normal people age>60 years are unable to recall a documented fall within three months
- there is no witness account in approximately 50% of syncopal episodes

Box 2

Summary points

- the history of syncope and falls is unreliable in the elderly
- amnesia for loss of consciousness is frequently found in carotid sinus syndrome
- there is evidence for the generalisability of this phenomenon
- patients with unexplained or recurrent falls suffer increased morbidity
- the healthcare implications are of missed diagnoses for which there are effective treatments
- patient management will be improved by including syncope in the differential diagnosis of unexplained falls

Box 4

Table Summary of data on amnesia in carotid sinus syndrome (CSS)

	Patients						
Reference	*n*	*mean age (years)*	*range*	*No with CSS*	*No with CSS presenting only with falls or falls and dizziness*	*No with CSS with amnesia for loss of consciousness*	*No of fallers with amnesia for loss of consciousness**
2	130	78	67–89	33	12	9	5
4	132	81	67–94	64	17	12	12
7	18	79	65–94	12	12	4	4
Total	280			109 (39%)	41 (38%)	25 (23%)	21 (51%)

*Includes patients presenting with falls alone or falls and dizziness. None of these patients presented with a history of syncope

Europace (2011) 13, 1040–1045
doi:10.1093/europace/eur069

Amnesia for loss of consciousness is common in vasovagal syncope

Clodagh O'Dwyer[1]*, Kathleen Bennett[2], Yvonne Langan[3], Chie Wei Fan[1], and Rose Anne Kenny[1]

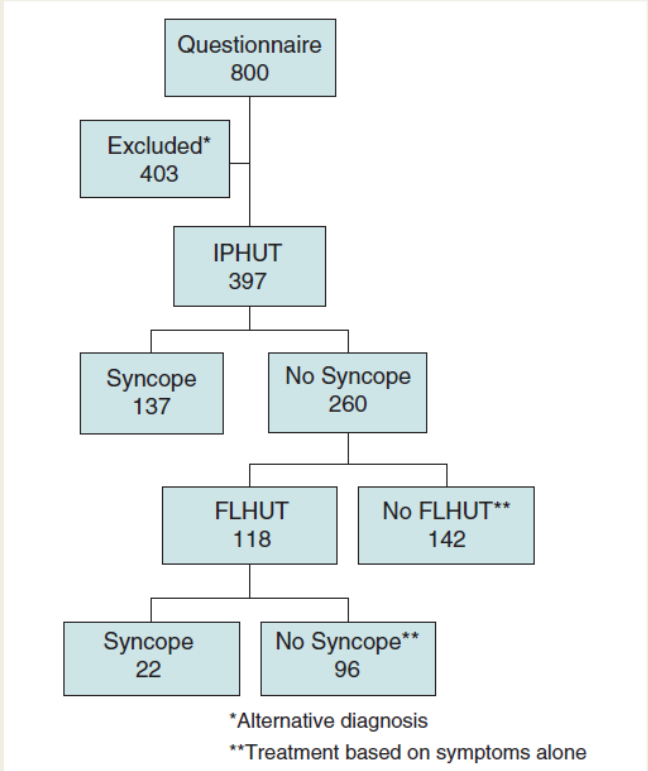


Figure 1 Pathway to head-up tilt. Figure showing pathway to Italian Protocol head-up tilt (IPHUT) and Front-loaded head-up tilt (FLHUT).

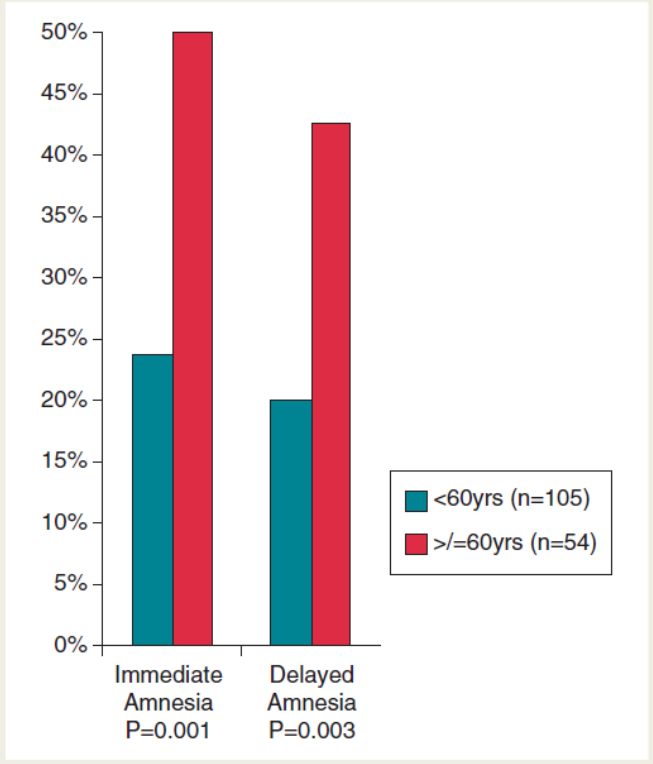


Figure 2 Amnesia for loss of consciousness (A-LOC) in different age-groups ($n = 159$). Twenty-five (23.5%) of those <60 years had immediate A-LOC compared with 27 (50%) of those >60 years ($P = 0.001$) CI 3.20 (1.59, 6.41). Twenty-one (20%) of those <60 years had delayed A-LOC compared with 23 (42.6%) of those >60 years ($P = 0.003$) CI 2.97 (1.44, 6.10).

The personal and health service impact of falls: the Newcastle 85+ cohort study

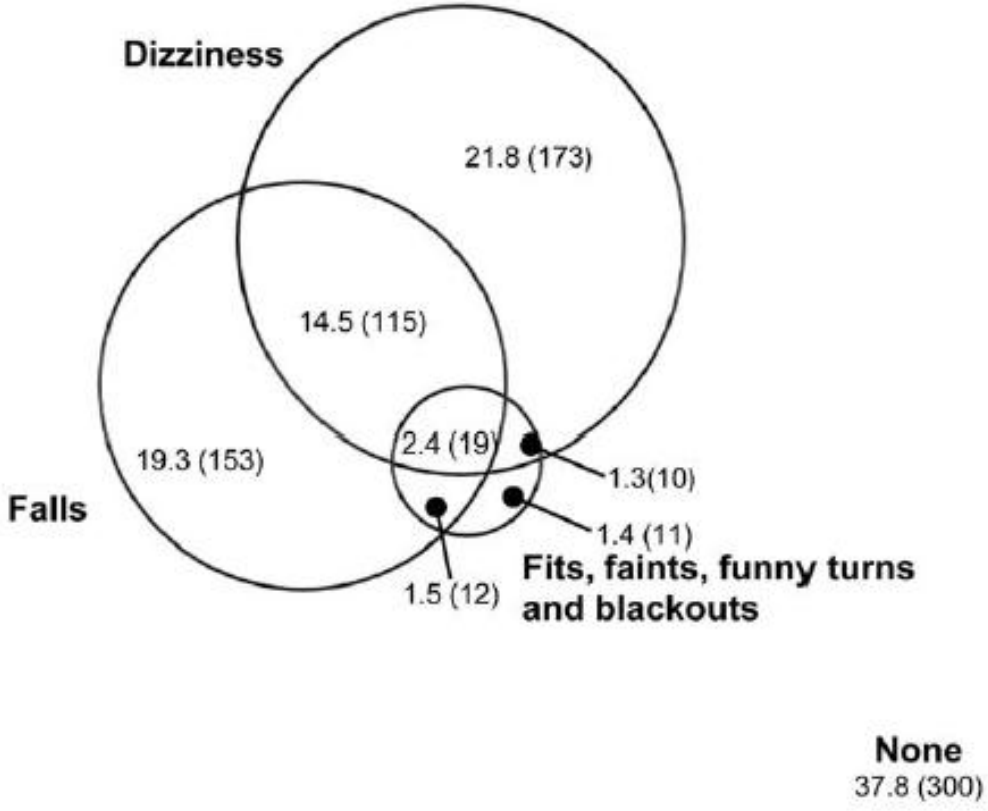


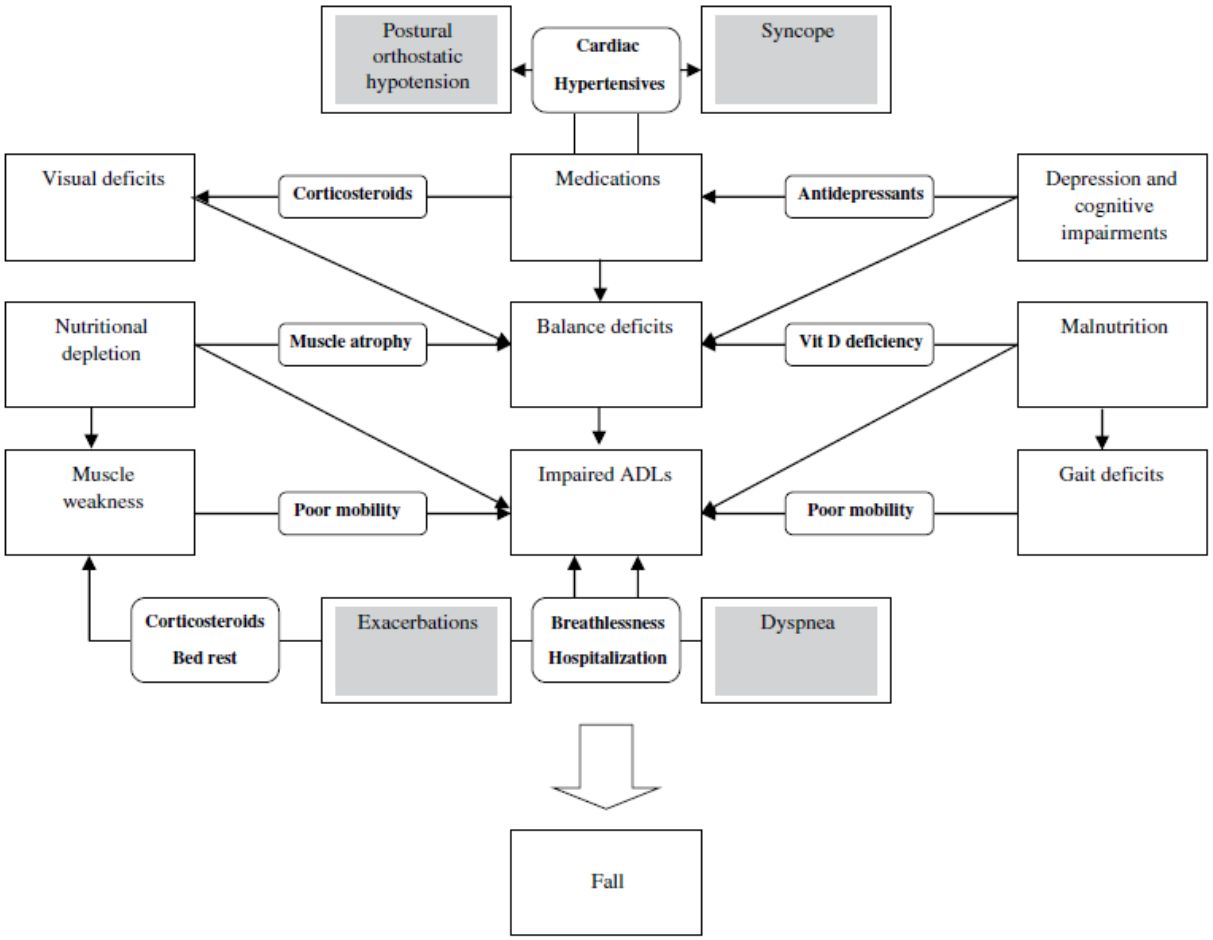
Figure 3. Venn diagram showing the overlap between falls, dizziness and blackouts, % (n)[2]. Figure footnote: [2]Reported for n = 793 with no missing data in any category.

Collerton et al Plos One 2012

Falls in patients with chronic obstructive pulmonary disease: A call for further research

Marc Roig [a,b,*], Janice J. Eng [a,c], Jeremy D. Road [d], W. Darlene Reid [a,b]

Respiratory Medicine (2009) 103, 1257–1269



La disabilità

Age and Ageing 2011; **40:** 696–702
doi: 10.1093/ageing/afr109
Published electronically 9 September 2011

Two-year morbidity and mortality in elderly patients with syncope

ANDREA UNGAR[1,2], GIANLUIGI GALIZIA[3], ALESSANDRO MORRIONE[1,2], CHIARA MUSSI[4], GABRIELE NORO[5], LOREDANA GHIRELLI[6], GIULIO MASOTTI[1,2], FRANCO RENGO[3], NICCOLÒ MARCHIONNI[1,2], PASQUALE ABETE[3]

Table 2. Main demographic and clinical characteristics stratified by mortality and syncope recurrence

Variables	Death		*P*-value	Syncope recurrence		*P*-value
	Yes ($n = 37$)	No ($n = 178$)		Yes ($n = 70$)	No ($n = 145$)	
Age (years)	83 ± 5	77 ± 7	<0.001	77 ± 6	77 ± 6	0.356 (NS)
Female (*n*, %)	18 (48.6)	106 (59.5)	0.07 (NS)	39 (55.7)	85 (58.6)	0.749 (NS)
BMI (kg/m^2)	23.4 ± 3.0	25.4 ± 3.4	0.02	25.2 ± 2.7	25.6 ± 3.7	0.386 (NS)
Drugs (*n*)	4.2 ± 2.2	3.2 ± 2.2	<0.01	3.2 ± 2.2	3.4 ± 2.3	0.634 (NS)
CIRS (*n*)	9.1 ± 3.1	6.7 ± 3.3	<0.001	7.0 ± 2.8	6.5 ± 3.3	0.704 (NS)
BADL lost (*n*)	0.7 ± 0.8	0.5 ± 1.0	0.399 (NS)	0.8 ± 1.2	0.3 ± 0.8	<0.01
IADL lost (*n*)	2.6 ± 2.7	1.7 ± 2.9	0.198 (NS)	2.3 ± 3.6	1.0 ± 2.5	0.042
MMSE (*n*)	25.1 ± 4.0	27.2 ± 3.7	0.007	26.0 ± 4.0	27.7 ± 2.8	<0.01
GDS (*n*)	2.8 ± 2.3	3.8 ± 3.8	0.163 (NS)	3.8 ± 4.2	3.8 ± 3.6	0.265 (NS)
Falls (*n*, %)	22 (59.4)	115 (64.6)	0.926 (NS)	46 (65.7)	92 (63.4)	0.688 (NS)
Fractures (*n*, %)	10 (27.0)	27 (15.1)	0.233 (NS)	13 (18.5)	20 (13.7)	0.596 (NS)
Hospitalisations	8 (21.6)	71 (39.8)	<0.001	24 (34.2)	55 (37.9)	<0.01

BMI, body mass index; CIRS, Cumulative Illness Rating Scale; BADL, basic activity daily living; IADL, instrumental activity daily living; MMSE, Mini-Mental State Examination; GDS, Geriatric Depression Scale.

Characteristic	(*n* = 5784) Without fall *n*	% (SD)	(*n* = 1144) With fall *n*	% (SD)	Odds ratio*	(95% CI)
Age category (years)						
55–64	2302	39.8%	280	24.5%	1.00	Ref
65–74	2141	37.0%	365	31.9%	1.42	(1.20,1.68)
75–84	1080	18.7%	343	30.0%	2.52	(2.11, 3.00)
> 85	261	4.5%	156	13.6%	4.31	(3.40, 5.46)
Mean age (SD)	68.6	(8.6)	73.2	(9.8)		
Female gender	3262	56.4%	868	75.9%	2.43	(2.10, 2.81)
Staying indoors	242	4.2%	169	14.8%	2.19	(1.74, 2.76)
Disability index						
Not disabled	4574	79.1%	595	52.0%	1.00	Ref
Mildly disabled	815	14.1%	272	23.8%	2.02	(1.70, 2.40)
Moderately disabled	254	4.4%	145	12.7%	2.93	(2.29, 3.74)
Severe disabled	141	2.4%	132	11.5%	4.53	(3.38, 6.07)
Alcohol use	2346	40.6%	344	30.1%	0.98	(0.84, 1.16)
Joint complaints	2789	48.2%	701	61.3%	1.51	(1.32, 1.73)
Visual acuity						
Both eyes intact	3860	66.7%	608	53.1%	1.00	Ref
One eye impaired	884	15.3%	203	17.7%	1.11	(0.92, 1.34)
Both eyes impaired	633	10.9%	236	20.6%	1.23	(0.99, 1.52)
Dizziness	1657	28.6%	557	48.7%	1.98	(1.74, 2.27)
Gait disturbance	318	5.5%	181	15.8%	2.47	(1.99, 3.07)
Postural disturbance	149	2.6%	87	7.6%	2.17	(1.62, 2.91)
Orthostatic hypotension†	44	0.8%	22	1.9%	2.10	(1.23, 3.61)
History of diabetes mellitus	328	5.7%	96	8.4%	1.29	(1.01, 1.65)
History of heart attack	523	9.0%	101	8.8%	1.01	(0.80, 1.28)
History of hypertension	804	13.9%	214	18.7%	1.25	(1.05, 1.50)
History of Parkinson's disease	28	0.5%	24	2.1%	3.27	(1.84, 5.82)
History of stroke	192	3.3%	83	7.3%	1.89	(1.43, 2.51)
History of thyroid diseases	477	8.2%	137	12.0%	1.17	(0.95, 1.45)
History of depressive episodes	1769	30.6%	435	38.0%	1.30	(1.13, 1.50)
Memory complaints	1007	17.4%	299	26.1%	1.49	(1.28, 1.74)

Predictors of falls and dizziness in older people – a longitudinal cohort study

Table 5
Predictors of falls in subjects younger and older than 80 years of age in the 3 and 6-year follow-ups.

Final model	OR[a,b,c]	95% CI for OR	*p*-Value	Crude OR	95% CI for crude OR	*p*-Value for crude OR
Under aged 80						
6-year follow-up ($n=438$)						
Neuroleptics	10.82	1.62–72.15	**0.014**	6.88	1.13–41.90	**0.036**
PADL dependency	6.58	1.00–43.18	**0.050**	9.37	1.68–52.08	**0.011**
History of falling	2.63	1.42–4.89	**0.002**	3.08	1.72–5.52	**<0.001**
Vision impairment	2.29	1.28–4.09	**0.005**	2.86	1.67–4.91	**<0.001**
Higher age	1.05	1.01–1.09	**0.022**	1.07	1.03–1.11	**<0.001**
80+years						
3-year follow-up ($n=233$)						
History of falling	2.05	1.10–3.82	**0.024**	2.09	1.16–3.75	**0.013**
Fatigue	2.00	1.12–3.58	**0.019**	0.44	0.25–0.26	**0.004**
Higher age	1.16	1.07–1.26	**<0.001**	0.00	1.07–1.26	**<0.001**
6-year follow-up ($n=174$)						
History of falling	3.18	1.49–6.80	**0.003**	4.10	1.97–8.50	**<0.001**
IADL dependency	2.72	1.35–5.47	**0.005**	3.50	1.80–6.82	**<0.001**

Bold values indicates statically significant p-value ≤ 0.05.
Dependent variable (falls) coded as: 0 = no falls, 1 = falls.
[a] Hosmer and Lemeshow goodness-of-fit test: under aged 80 $p=0.886$, 80+ years 3-years $p=0.420$ 6-years $p=0.406$.
[b] Nagelkerke R^2: under aged 80 0.138, 80+ years 3-years 0.153 6-years 0.167.
[c] Variables at baseline entered into the regression analysis (manual backward): 3-year: age, IADL, Romberg EC, history of fall, fear of falling, self-reported balance impairment, fatigue, hearing, vision, hypnotics. 6-year: under aged 80: age, IADL, grip strength, history of fall, dizziness, fear of falling, self-reported balance impairment, hearing, vision, neuroleptics, sedatives. 80+ years: IADL, history of fall, self-reported balance impairment, fatigue.

Olson Moller et al, Arch Gerontol Geriatr 2012

I farmaci e le linee guida per patologia

Parachute use to prevent death and major trauma related to gravitational challenge: systematic review of randomised controlled trials

BMJ 2003;327:1459–61

Gordon C S Smith, Jill P Pell

Abstract

Objectives To determine whether parachutes are effective in preventing major trauma related to gravitational challenge.
Design Systematic review of randomised controlled trials.
Data sources: Medline, Web of Science, Embase, and the Cochrane Library databases; appropriate internet sites and citation lists.
Study selection: Studies showing the effects of using a parachute during free fall.
Main outcome measure Death or major trauma, defined as an injury severity score >15.
Results We were unable to identify any randomised controlled trials of parachute intervention.
Conclusions As with many interventions intended to prevent ill health, the effectiveness of parachutes has not been subjected to rigorous evaluation by using randomised controlled trials. Advocates of evidence based medicine have criticised the adoption of interventions evaluated by using only observational data. We think that everyone might benefit if the most radical protagonists of evidence based medicine organised and participated in a double blind, randomised, placebo controlled, crossover trial of the parachute.

Parachutes reduce the risk of injury after gravitational challenge, but their effectiveness has not been proved with randomised controlled trials

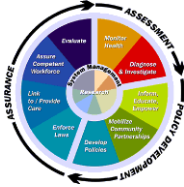


Table 3. Treatment Regimen Based on Clinical Practice Guidelines for a Hypothetical 79-Year-Old Woman With Hypertension, Diabetes Mellitus, Osteoporosis, Osteoarthritis, and COPD*

Time	Medications†	Other
7:00 AM	Ipratropium metered dose inhaler 70 mg/wk of alendronate	Check feet Sit upright for 30 min on day when alendronate is taken Check blood sugar
8:00 AM	500 mg of calcium and 200 IU of vitamin D 12.5 mg of hydrochlorothiazide 40 mg of lisinopril 10 mg of glyburide 81 mg of aspirin 850 mg of metformin 250 mg of naproxen 20 mg of omeprazole	Eat breakfast 2.4 g/d of sodium 90 mmol/d of potassium Low intake of dietary saturated fat and cholesterol Adequate intake of magnesium and calcium Medical nutrition therapy for diabetes‡ DASH‡
12:00 PM		Eat lunch 2.4 g/d of sodium 90 mmol/d of potassium Low intake of dietary saturated fat and cholesterol Adequate intake of magnesium and calcium Medical nutrition therapy for diabetes‡ DASH‡
1:00 PM	Ipratropium metered dose inhaler 500 mg of calcium and 200 IU of vitamin D	
7:00 PM	Ipratropium metered dose inhaler 850 mg of metformin 500 mg of calcium and 200 IU of vitamin D 40 mg of lovastatin 250 mg of naproxen	Eat dinner 2.4 g/d of sodium 90 mmol/d of potassium Low intake of dietary saturated fat and cholesterol Adequate intake of magnesium and calcium Medical nutrition therapy for diabetes‡ DASH‡
11:00 PM	Ipratropium metered dose inhaler	
As needed	Albuterol metered dose inhaler	

Boyd et al, JAMA 2005

Polypharmacy and falls in the middle age and elderly population

G. Ziere,[1,2] J. P. Dieleman,[3] A. Hofman,[2] H A. P. Pols,[2,4] T. J. M. van der Cammen[1,2] & B. H. CH. Stricker[2,4,5]

[1]Section of Geriatric Medicine, Department of Internal Medicine, [2]Department of Epidemiology & Biostatistics, [3]Department of Medical Informatics and [4]Department of Internal Medicine, Erasmus MC, Rotterdam, and [5]Drug Safety Unit, Inspectorate for Healthcare, the Hague, the Netherlands

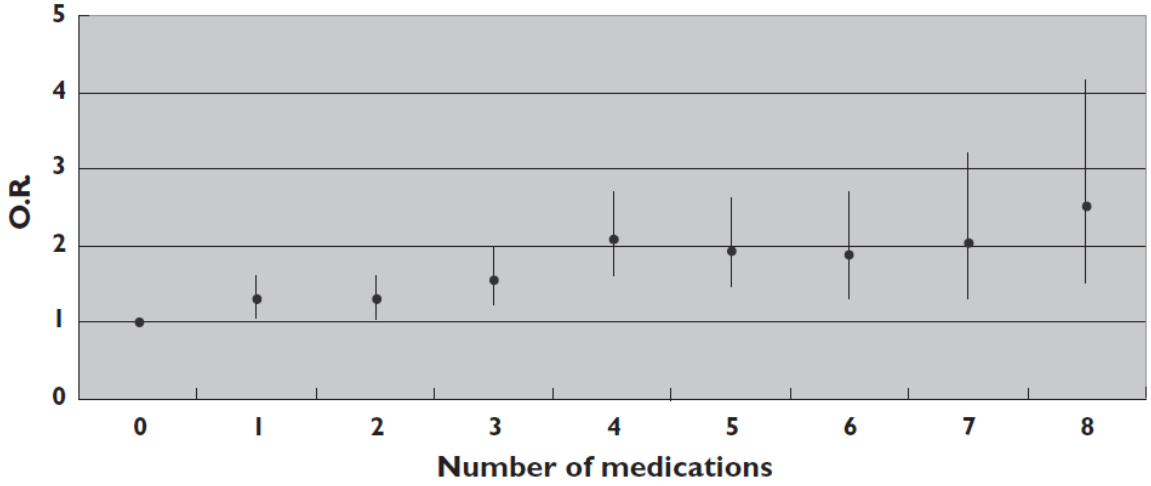


Figure 1
Influence of the number of medications on falling adjusted for age & gender (p for trend <0.001)

Withdrawal of fall-risk-increasing drugs

Table 2
Use and withdrawal of fall-risk-increasing drugs (n = 139)

	Baseline use (n = 126)		Number of withdrawals (n = 75)	
Psychotropic drugs	33	(26%)	29	(39%)
Sedatives	26	(21%)	22	(29%)
Antidepressants	14	(11%)	8	(11%)
Neuroleptics	3	(2%)	2	(3%)
Cardiovascular drugs	62	(50%)	41	(55%)
Antihypertensives	51	(41%)	29	(39%)
Nitrates	15	(12%)	5	(7%)
Anti-arrhythmics	4	(3%)	3	(4%)
Nicotinic acid	1	(1%)	1	(1%)
β-adrenoceptor blocker eye drops	3	(2%)	3	(4%)
Other drugs	41	(33%)	18	(24%)
Analgesics	68	(54%)	9	(12%)
Antivertigo preparations	11	(9%)	7	(9%)
Hypoglycaemics	20	(16%)	1	(1%)
Urinary antispasmodics	4	(3%)	1	(1%)

In the second column, the baseline usage of FRID for the total study population is shown. In total, 126 patients used 262 fall-risk-increasing drugs (FRID). In the third column, the 91 withdrawn FRID in 75 patients are given, clustered in psychotropic, cardiovascular and other drugs.

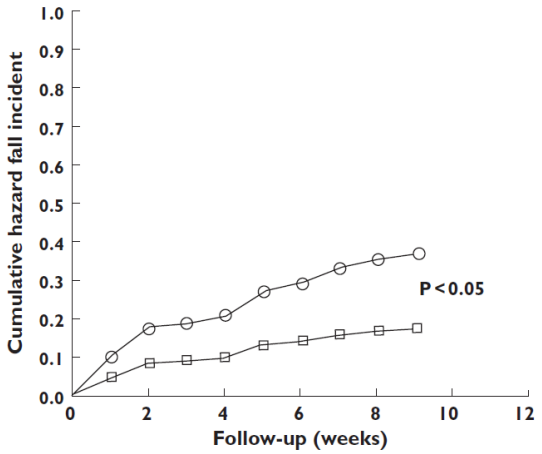


Figure 1
Cumulative hazard of a fall incident in 75 patients with FRID withdrawal (□) and 64 patients without FRID withdrawal (○)

Table I. Cost-effectiveness analysis: assumptions[a]

Parameters	Baseline estimate (95% CI)	Source
Falls		
Risk reduction in number of falls due to drug withdrawal	0.89 (0.33, 0.98)	Own data (table III)
Proportion of study population with FRID withdrawal	0.54 (0.46, 0.62)	Own data
Proportion of injurious falls needing hospital treatment	0.098 (0.049 in sensitivity analysis)	Stel et al.[15]
Costs, resource use		
Assessment costs (15 min)	€42	Expert estimate
Follow-up: telephone calls	4.1 (3.7, 4.6)	Own data
Telephone call (5 min)	€4	Expert estimate
Follow-up visit (30 min)	€84	Expert estimate
Savings in pharmaceuticals consumption per month	€12 (8, 18)	Own data
Medical costs per injury due to a fall	€5250	Meerding et al.[16]

a All costs calculated for the 2005 financial year.
FRID = fall-risk-increasing drugs.

Table VI. Costs[a] and savings of withdrawal of fall-risk-increasing drugs in older fallers (n = 139)

Parameter	Baseline		Sensitivity analysis[b]	
	mean	95% CI	mean	95% CI
Prevented no. of falls in months 2 and 3	3.4	1.4, 4.5	3.4	1.4, 4.5
Incremental costs per person assessed (€)				
intervention costs	98	89, 106	98	89, 106
savings in pharmaceutical consumption	12	8, 18	13	8, 18
medical savings due to prevented injuries	1775	744, 2270	889	371, 1136
total savings	1691	662, 2181	804	286, 1046
savings per prevented fall	491	465, 497	233	208, 239

a All costs calculated for the 2005 financial year.
b Proportion of falls with injury reduced by 50% from 0.098 to 0.049.

van der Velde et al, 2007
van der Velde et al, 2008

Lesson of the week

Syncope and falls due to timolol eye drops

Marije E Müller, Nathalie van der Velde, Jaap W M Krulder, Tischa J M van der Cammen

BMJ 2006;332:960–1

Sudden hypotensive syncope and significant iatrogenic maxillofacial trauma

following administration of oral sodium phosphate purgative solution

by John V Williams, Serryth D Colbert and Peter J Revington

The Journal of Perioperative Practice; May 2010; 20, 5; ProQuest Nursing & Allied Health Source
pg. 181

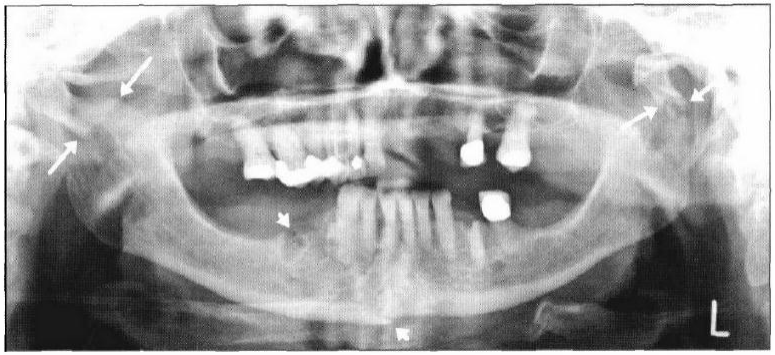


Figure 1: Orthopantomogram (OPG) radiograph demonstrating bilateral condylar fractures (long arrows) and right parasymphyseal fracture (short arrows)

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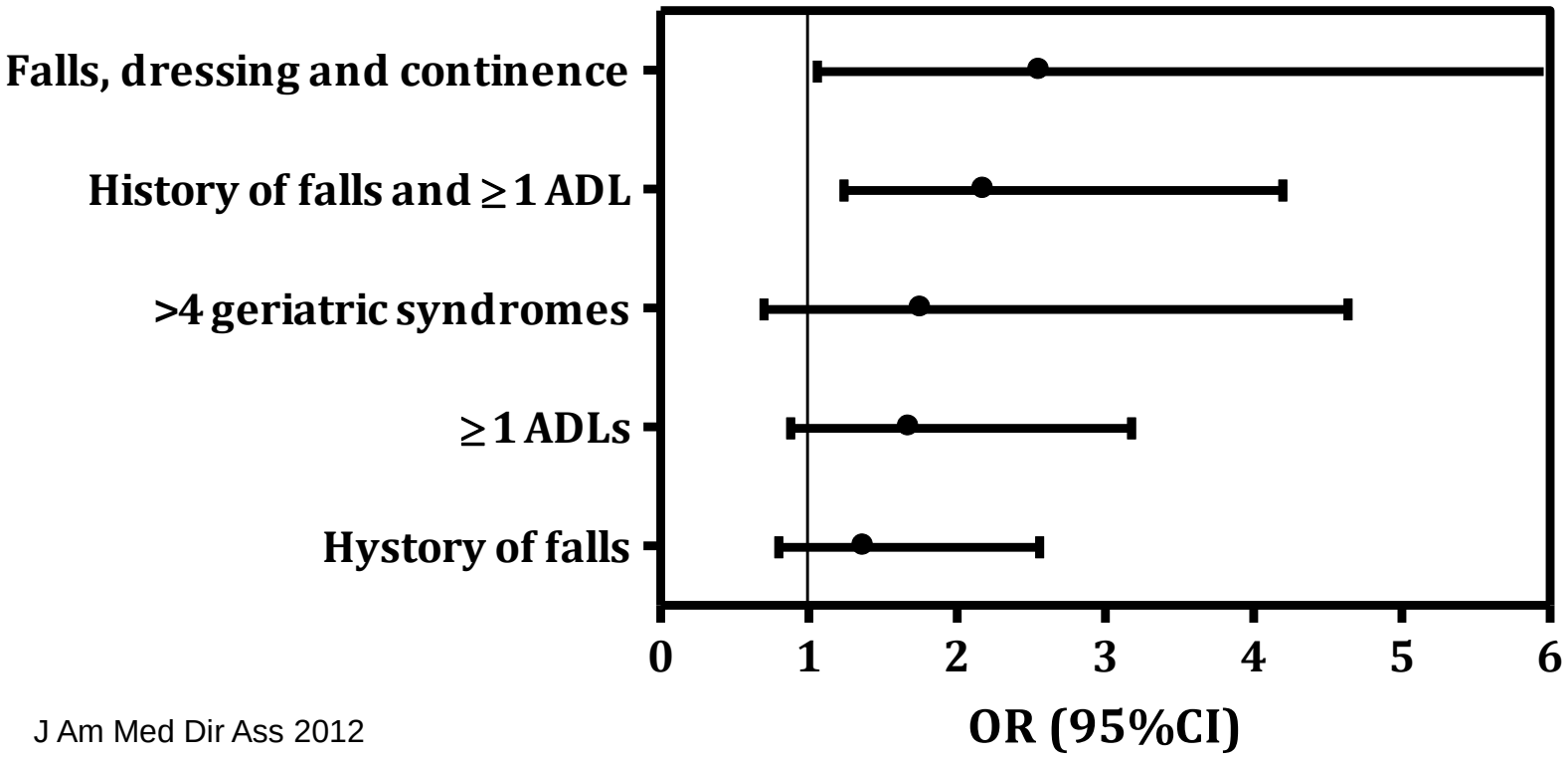
Brief Report

Geriatric Conditions and Adverse Drug Reactions in Elderly Hospitalized Patients

Fabrizia Lattanzio MD, PhD [a], Irma Laino MD [b,*], Claudio Pedone MD, PhD [c,d], Francesco Corica MD [e], Giuseppe Maltese MD, PhD [f], Giovanni Salerno HN [g], Sabrina Garasto ScD [b], Andrea Corsonello MD [b], Raffaele Antonelli Incalzi MD [c,h] on behalf of the PharmacosurVeillance in the elderly Care (PVC) Study Group



Digoxin official datasheet

Maintenance Dose:-

The maintenance dosage should be based upon the percentage of the peak body stores lost each day through elimination. The following formula has had wide clinical use:-

$$\text{Maintenance dose} = \text{Peak body stores} \times \frac{\text{daily loss in percent}}{100}$$

Where:- Peak body stores = loading dose

Daily loss (in percent) = 14 + creatinine clearance ( )/5

is creatinine clearance corrected to 70kg bodyweight or 1. body surface area. If only serum creatinine ( ) concentrations are available, a (corrected to 70 kg bodyweight) may be estimated in men as

$$= \frac{(140 - \text{age})}{(\text{in mg/100mL})}$$

The NEW ENGLAND JOURNAL of MEDICINE
N ENGL J MED 367;13 NEJM.ORG SEPTEMBER 27, 2012

CORRESPONDENCE

Estimating Glomerular Filtration Rate

ORIGINAL ARTICLE

Estimating Glomerular Filtration Rate from Serum Creatinine and Cystatin C

Lesley A. Inker, M.D., Christopher H. Schmid, Ph.D., Hocine Tighiouart, M.S., John H. Eckfeldt, M.D., Ph.D., Harold I. Feldman, M.D., Tom Greene, Ph.D., John W. Kusek, Ph.D., Jane Manzi, Ph.D., Frederick Van Lente, Ph.D., Yaping Lucy Zhang, M.S., Josef Coresh, M.D., Ph.D., and Andrew S. Levey, M.D., for the CKD-EPI Investigators*

The combined creatinine–cystatin C equation performed better than equations based on either of these markers alone and may be useful as a confirmatory test for chronic kidney disease. (Funded by the National Institute of Diabetes and Digestive and Kidney Diseases.)

TO THE EDITOR: In the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) article on estimating the glomerular filtration rate (GFR), Inker et al. (July 5 issue)[1] describe a combined creatinine–cystatin C equation. However, this equation should be used with some caution in elderly patients, since in this study, the average age of the participants was 47 to 50 years, and only 13 to 21% were over the age of 65 years. Indeed, fat-free mass, a measurement that is inversely related to age, affects the cystatin C level, and in older patients with chronic kidney disease, GFR estimation improves when fat-free mass is considered.[2] Furthermore, among participants over the age of 80 years who were enrolled in the Cardiovascular Health Study, there was a U-shaped relationship between the GFR and mortality, probably due to the clustering of participants with sarcopenia in the upper percentiles of the GFR.[3] In the same population, cystatin-derived GFR values were associated with mortality limited to GFR values in the lowest quintile. The different meaning of these measures in very elderly and frail patients, who constitute a rapidly rising proportion of those with renal impairment, suggests that the proposed equation should be tested for both precision and accuracy in such patients.

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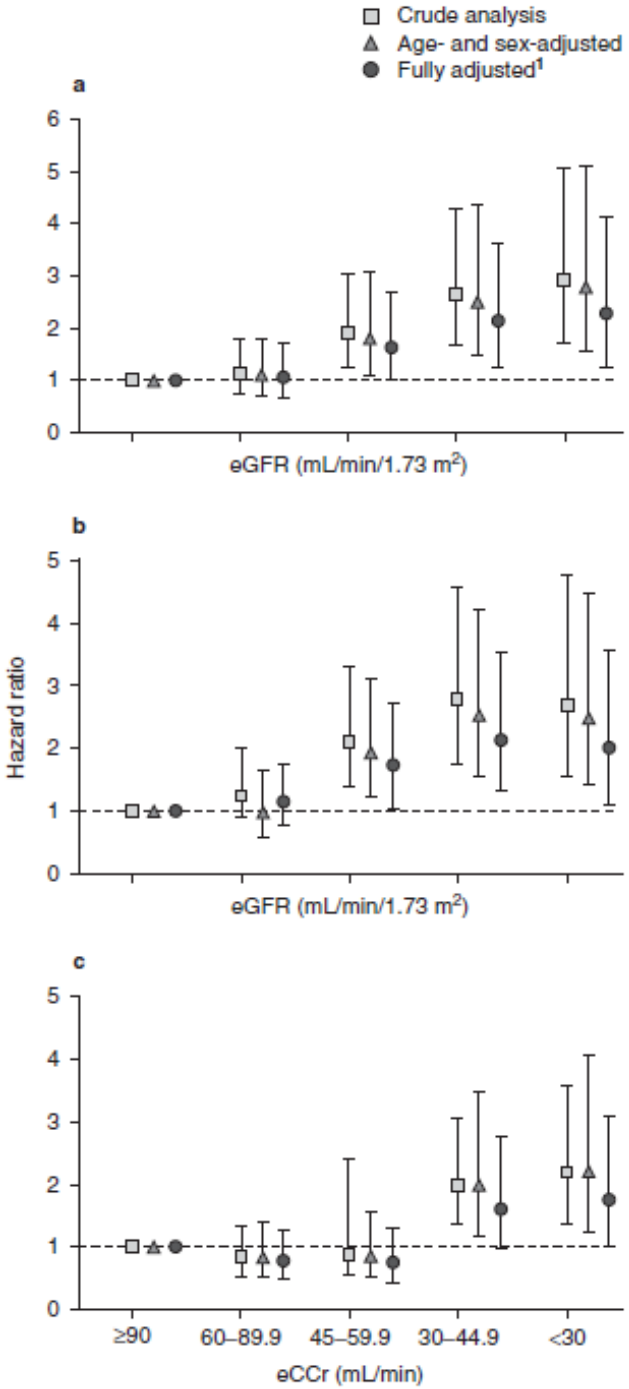


Cockcroft-Gault (CG)

$$eCCr = (140 - age) \times \text{weight in kg}/(72 \times Scr) \times 0.85 \text{ in females} \quad \text{(eq. 1)}$$

Modification of Diet in Renal Disease (MDRD)

$$eGFR = \left[186.3 \times (Scr)^{-1.154} \times (age)^{-0.203}\right] \times 0.742 \text{ in females} \quad \text{(eq. 2)}$$

Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI)

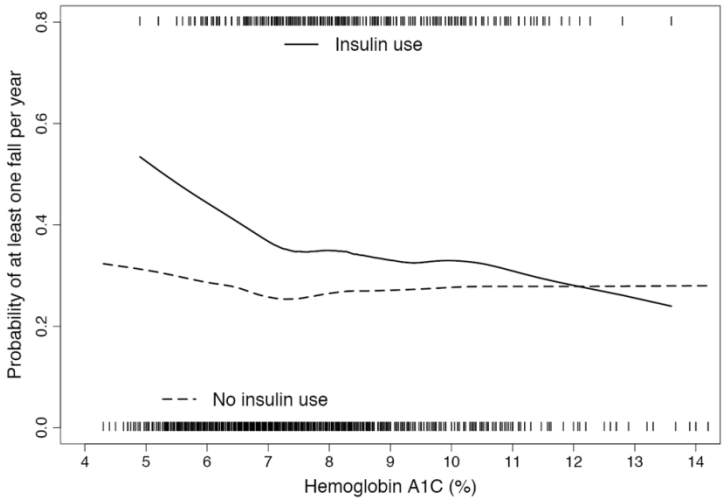
Female	(Scr ≤0.7)	$eGFR = 144 \times (Scr/0.7)^{-0.329} \times (0.993)^{age}$
	(Scr >0.7)	$eGFR = 144 \times (Scr/0.7)^{-1.209} \times (0.993)^{age}$
Male	(Scr ≤0.9)	$eGFR = 141 \times (Scr/0.9)^{-0.411} \times (0.993)^{age}$
	(Scr >0.9)	$eGFR = 141 \times (Scr/0.9)^{-1.209} \times (0.993)^{age}$

(eq. 3)

Adjusted for age, gender, dependency in at least 1 ADL, hypoalbuminemia, number of drugs, number of diseases

Corsonello et al, Drugs Aging 2012

Diabetes-related complications, glycemic control, and falls in older adults



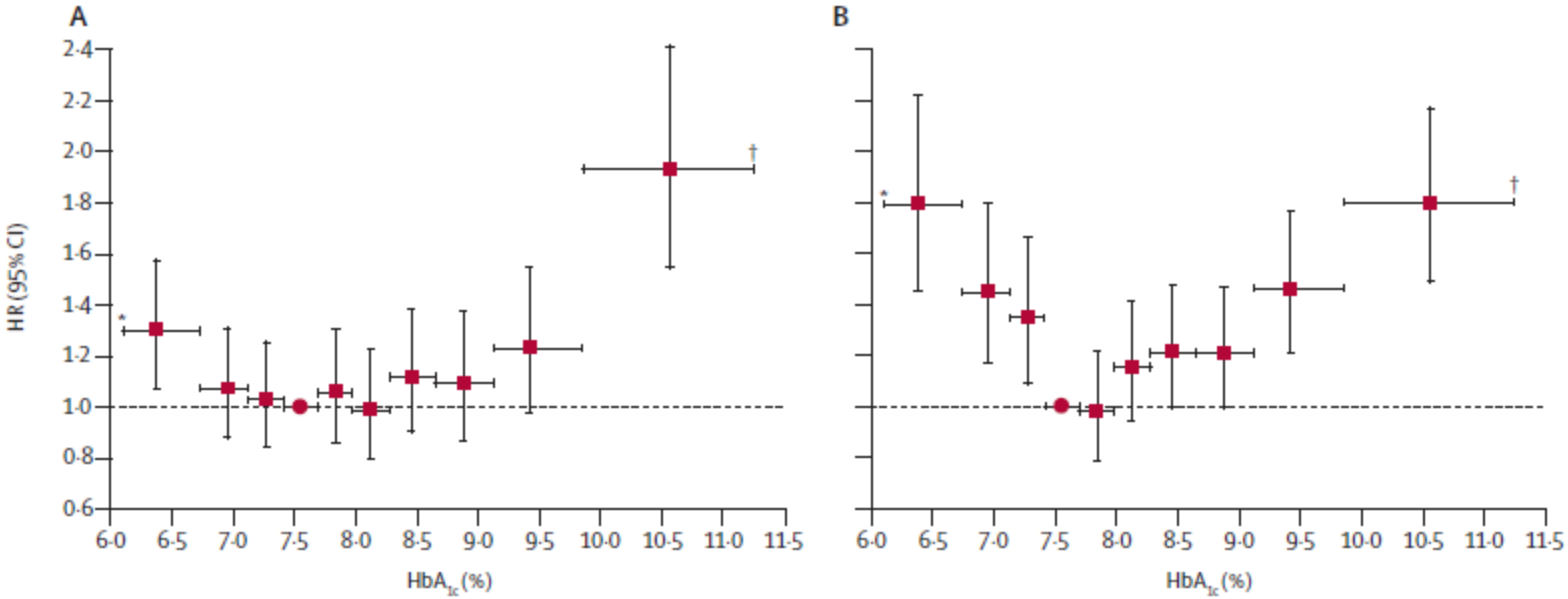
Schwartz et al, Diabetes Care 2008

TABLE 1

Targets for diabetes control

	AMERICAN DIABETES ASSOCIATION[11]	AMERICAN GERIATICS SOCIETY[15]	DEPARTMENT OF VETERANS AFFAIRS[16,24]
Hemoglobin A_{1c}	< 7.0%	< 7.0% in adults who have good functional status 8.0% if frail or if life expectancy is < 5 years	< 7% if life expectancy is > 15 years (no major comorbidity) 8% if life expectancy is 5–15 years (moderate comorbid condition) 9% if life expectancy is < 5 years (major comorbid condition)
Preprandial blood glucose level	90–130 mg/dL (5.0–7.2 mmol/L)		
Peak postprandial blood	< 180 mg/dL (< 10.0 mmol/L)		
Bedtime blood glucose level	110–150 mg/dL (6.1–8.3 mmol/L)		

Hornick et al, Clev Clin J Med 2008



Currie et al, The Lancet 2010

Conclusioni

- Sincopi e cadute rappresentano un problema di grande rilevanza nella pratica clinica
- Sebbene i pazienti anziani siano particolarmente esposti a questo tipo di problemi, le conoscenze epidemiologiche sono limitate
- L'applicazione sistematica di strumenti di screening è fondamentale sia sul piano epidemiologico che clinico
- La complessità del paziente anziano richiede sempre un'attenzione particolare (che nella maggior parte dei casi non è contemplata nelle linee guida)

Meno sappiamo e più lunghe sono le nostre spiegazioni.

Ezra Pound