TIGULLIO 2024
II Congresso Nazionale di ARITMOLOGIA
16-17 Aprile Sestri Levante (GE)

Presidente del Congresso
Guido Parodi, Lavagna

Comitato Scientifico
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Sede Congressuale
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Sestri Levante

Diagnosi e terapia delle cadute a terra nell'anziano

Andrea Ungar
Università di Firenze

Morbilità e Mortalità nei pazienti anziani con caduta

- 5-10 % riporta danno grave (frattura, trauma cranico o lacerazioni → Aumento rischio di istituzionalizzazione

(Tinetti et. Al, NEJM 1997)

- 6% si frattura

- 1% si frattura il femore → 20-30 % mortalità ad un anno

- 30-73% dei pazienti anziani sviluppa una sindrome ansioso depressiva post-caduta

Falls in the elderly

... *a common concern*

In the community ...

- 28–35% incidence/year in subjects ≥65 year
- 40%/year in subjects ≥80
- 15% of older people falls at least twice

In the hospital ...

- 2% of hospitalized patients
- 25% injurious falls

In long-term care settings ...

- 30–50%/year, with 40% falling recurrently
- 10% severely injurious falls

Patients with dementia

60% annual incidence

Way, NEJM 1997; Masud , Age Ageing 2001; WHO Global report 2007; Lelaurin, Clin Geriatr Med 2019

Falls in the elderly
Prognosis

Hip fracture
Disability
Institutionalization
Mortality

Mortality

Social isolation
Depression
Anxiety
Low quality of life

Major Injuries
Fractures

Mobility
Impairment

Functional decline
and dependency

Hospitalization

Health care
costs

Early admission to
long term
care facilities

Fear of falling
Activity restriction
Deconditioning

Emergency
department visits

Tinetti ME, NEJM 2003; Khow K, Clin Geriatr Med 2017

Rischio di istituzionalizzazione e cadute

Variabili	1 caduta nessun danno	>1 caduta nessun danno	caduta con danno
	Hazard Ratio (95% CI)		
Caduta	4.9 (3.2-7.5)	8.5 (3.4-21.2)	19.9 (12.2-32.6)
Caduta + Età e sesso	4.2 (2.7-6.6)	7.1 (2.8-17.7)	16.6 (10.0-27.6)
Caduta + VMD	3.1 (1.9-4.9)	5.5 (2.1-14.2)	10.2 (5.8-17.9)

VMD = valutazione multidimensionale

Tinetti ME et al, NEJM 1997

Classification

Accidental falls

(Accidental causes like slipping or tripping)

Falls associated with medical conditions

(gait and balance disorders, neurological diseases, cardiovascular diseases, …)

Falls in people with dementia

(occurring in patients with moderate to severe dementia)

Unexplained falls *(15-40%)*

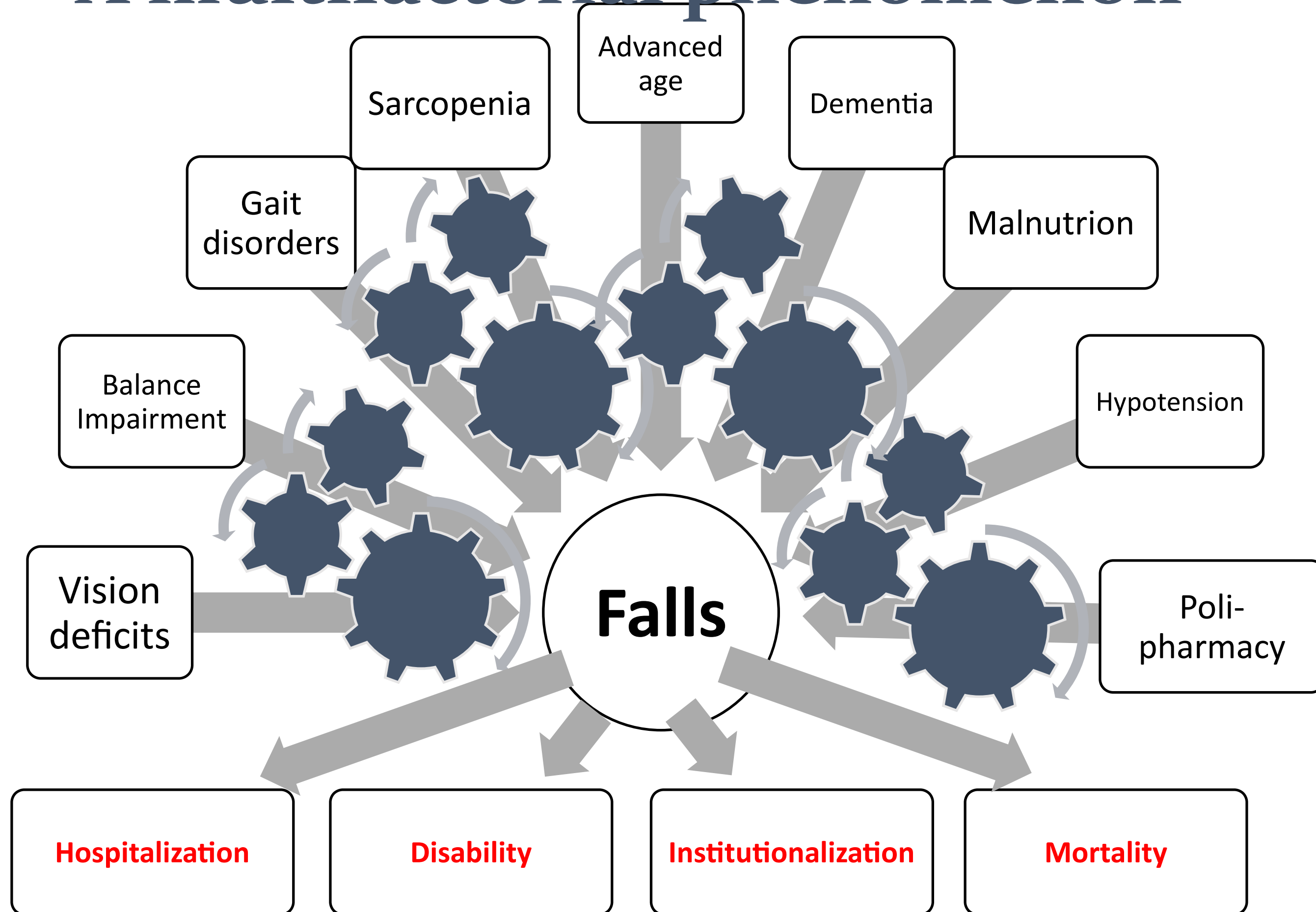
(non-accidental falls, where no apparent cause has been found)

"… I found myself suddenly on the ground …"

Masud T, Age Ageing, 2001

Mussi C ,Curr Gerontol Geriatr Res, 2013

A multifactorial phenomenon



Mossello E, in Manuale di Geriatria, 2019

Falls in the elderly

A multifactorial syndrome

1. Multifactorial diagnostic assessment

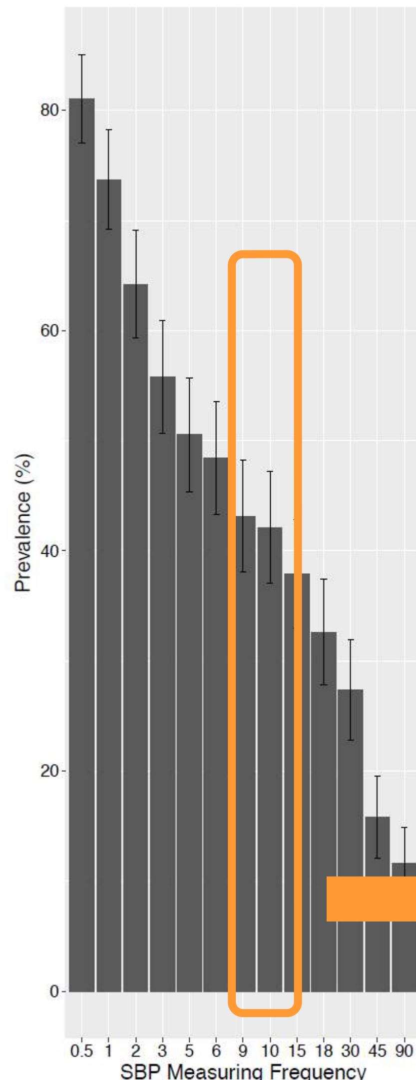
... to define ...

2. Individual's risk profile

... to provide ...

3. Individualized multifactorial interventions

Neurocardiovascular instability



Prevalence of postprandial hypotension in geriatric falls clinic

N=95 participants (mean age 77.5) undergoing a standardized meal test during beat-to-beat BP monitoring

Postprandial hypotension prevalence assessed with different time windows length

Postprandial hypotension **prevalence ranging from 81% to 11%** according to the frequency of BP measurements

42.1% prevalence with BP measurements at 10 min intervals

Madden KM, Clin Invest Med 2019

Sincope e cadute? Esiste un “overlapping”??

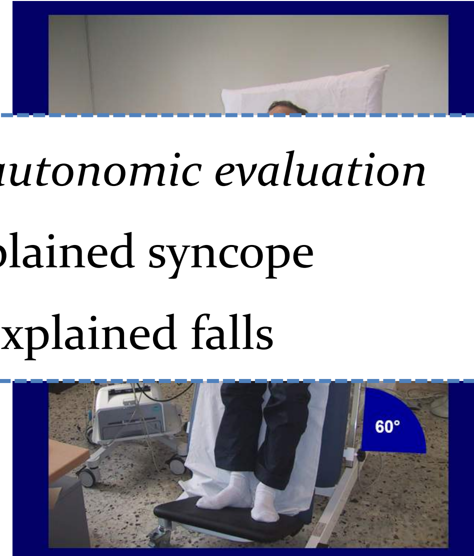
Aging Clin Exp Res (2014) 26:33–37
DOI 10.1007/s40520-013-0124-8

ORIGINAL ARTICLE

Clinical aspects and diagnostic relevance of neuroautonomic evaluation in patients with unexplained falls

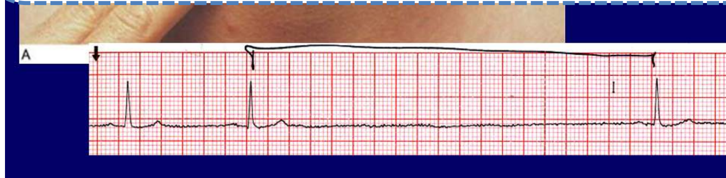
M. Rafanelli · E. Ruffolo · V. M. Chisciotti · M. A. Brunetti · A. Ceccofiglio · F. Tesi · A. Morrione · N. Marchionni · A. Ungar

N=298 subjects with unexplained falls
N=989 subjects with unexplained syncope



Diagnosis achieved after the neuroautonomic evaluation

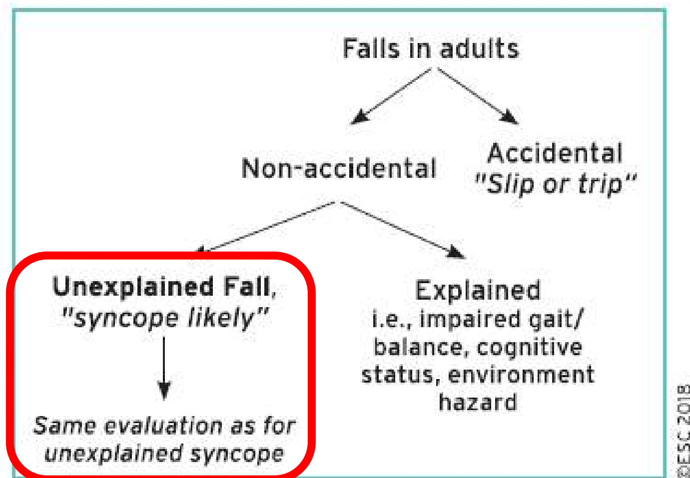
- ✓ 64% of patients with unexplained syncope
- ✓ 61 % of patients with unexplained falls



ESC
European Society of Cardiology
European Heart Journal (2018) **00**, 1–69
doi:10.1093/eurheartj/ehy037
ESC GUIDELINES

2018 ESC Guidelines for the diagnosis and management of syncope

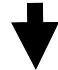
The Task Force for the diagnosis and management of syncope of the European Society of Cardiology (ESC)



Brignole M, Eur Heart J 2018

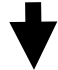
Falls in the elderly
A multifactorial syndrome

1. Multifactorial diagnostic assessment



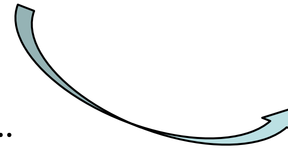
... to define ...

2. Individual's risk profile



... to provide ...

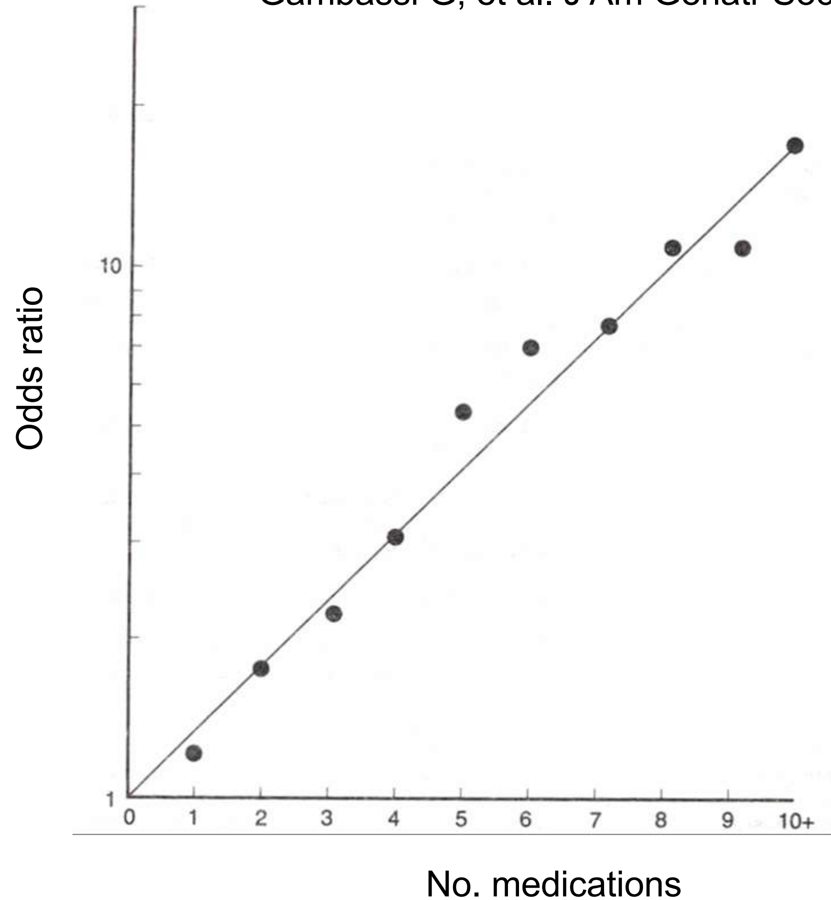
3. Individualized multifactorial interventions



Medications

Adverse drug reactions

Gambassi G, et al. J Am Geriatr Soc 1991



No. medications

Multifactorial diagnostic assessment

Medications

Anti psychotics

Laxatives

Opioids

Beta-blockers

Diuretics

Antidepressants

Nitrates

Falls

BDZs

Levo Dopa

Vestibular suppressants

Calcium Antagonists

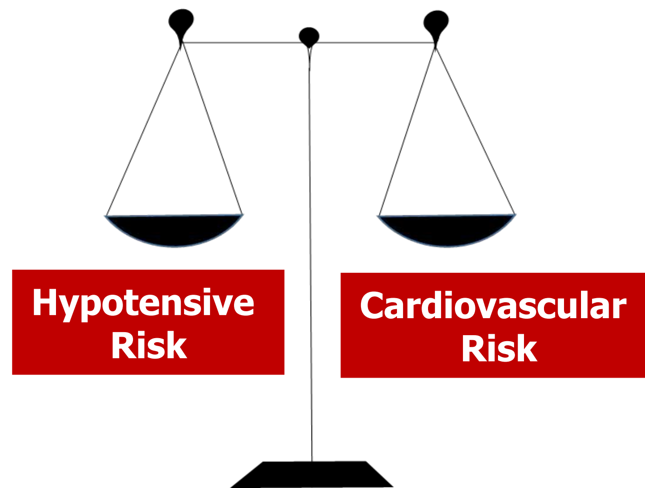
Hypoglycemic agents

Alpha-blockers

Huang AR and Hill K, Drugs Aging 2012

Revisione della terapia farmacologica e deprescribing

La scelta di ridurre il trattamento antipertensivo si basa sul bilancio tra rischio cardiovascolare e rischio ipotensivo del singolo paziente



High risk of syncope Antihypertensive treatment-related syncope AND one of the following	High risk of cardiovascular events[a]
At least three syncope episodes over the previous 2 years	Clinical cardiovascular disease (coronary artery disease, stroke/TIA, peripheral artery disease)
Syncope-related fracture or intracranial bleeding	Diabetes mellitus with target organ damage
Recurrent hypotensive presyncope with a significant impact on quality of life	Severe chronic kidney disease
Syncope due to orthostatic hypotension[b]	Calculated 10-year SCORE[c] ≥10%

[a]Defined in accordance with Williams *et al.* [20].
[b]Defined as per Brignole *et al.* [16] by the presence of a symptomatic abnormal BP fall and history of syncope highly suggestive of orthostatic hypotension.
[c]Available at: http://www.escardio.org/Guidelines-&-Education/Practice-tools/CVD-prevention-toolbox/SCORE-Risk-Charts [54].

Rivasi et al. J Hypertension 2021

Multifactorial diagnostic assessment

Medications

Anti psychotics

Laxatives

Opioids

Beta-blockers

Diuretics

Antidepressants

Nitrates

Falls

BDZs

Levo Dopa

Vestibular suppressants

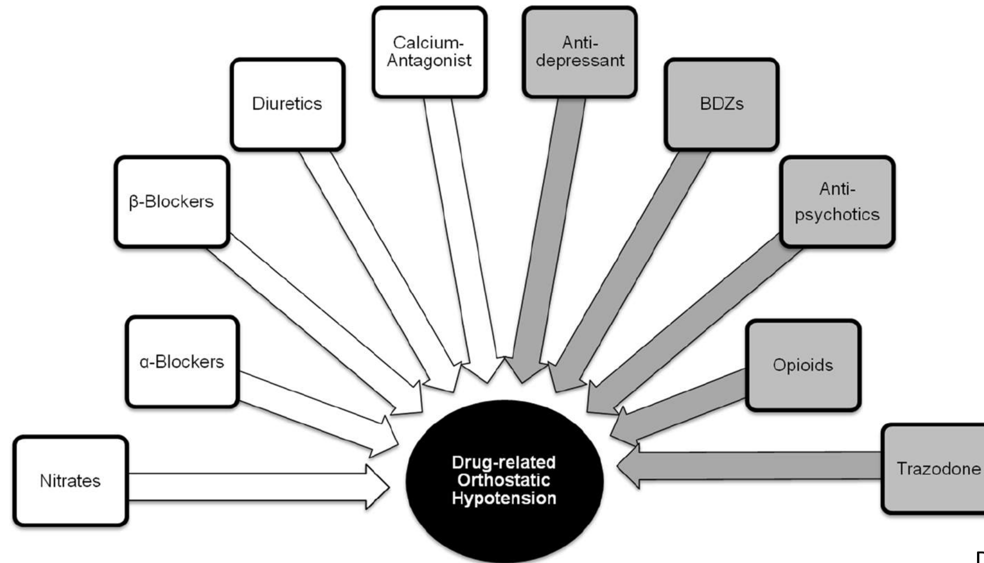
Calcium Antagonists

Hypoglycemic agents

Alpha-blockers

Huang AR and Hill K, Drugs Aging 2012

Drug-Related Orthostatic Hypotension: Beyond Anti-Hypertensive Medications



Drugs and Aging 2020

Contents lists available at ScienceDirect

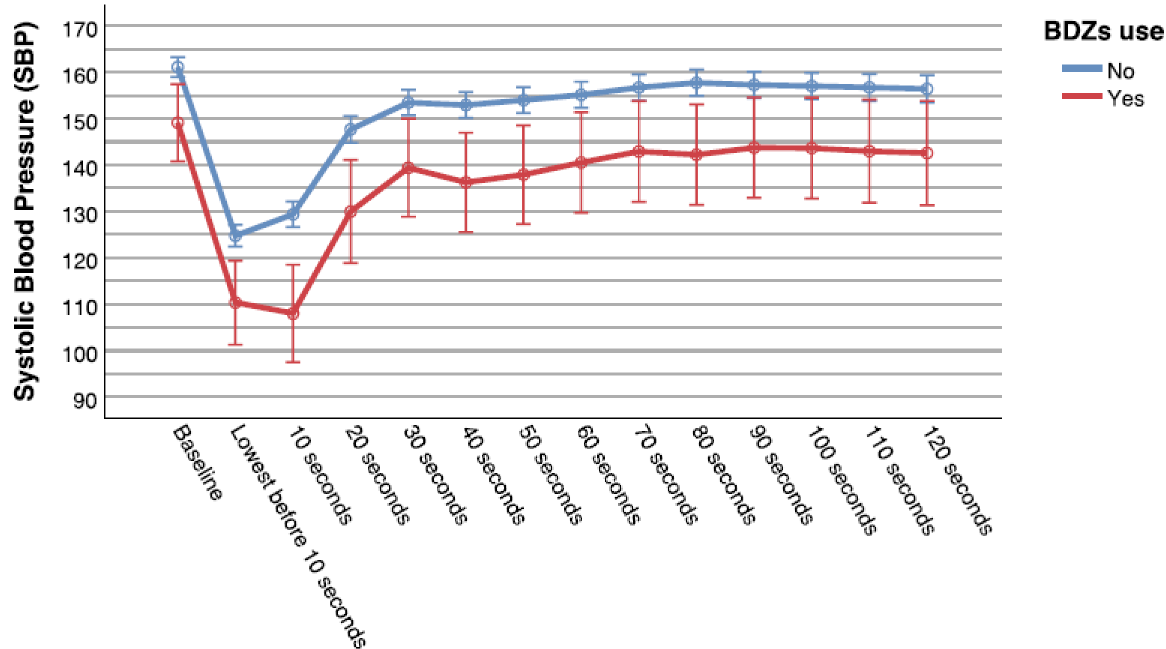
European Journal of Internal Medicine

journal homepage: www.elsevier.com/locate/ejim

Original article

Effects of benzodiazepines on orthostatic blood pressure in older people

Giulia Rivasi[a,*], Rose Anne Kenny[b], Andrea Ungar[a], Roman Romero-Ortuno[b]



Multifactorial diagnostic assessment

Medications

Anti psychotics

Laxatives

Opioids

Beta-blockers

Diuretics

Antidepressants

Nitrates

Falls

BDZs

Levo Dopa

Vestibular suppressants

Calcium Antagonists

Hypoglycemic drugs

Alpha-blockers

Huang AR, Drugs Aging 2012; Machado Duque, Int Psychogeriatrics 2017

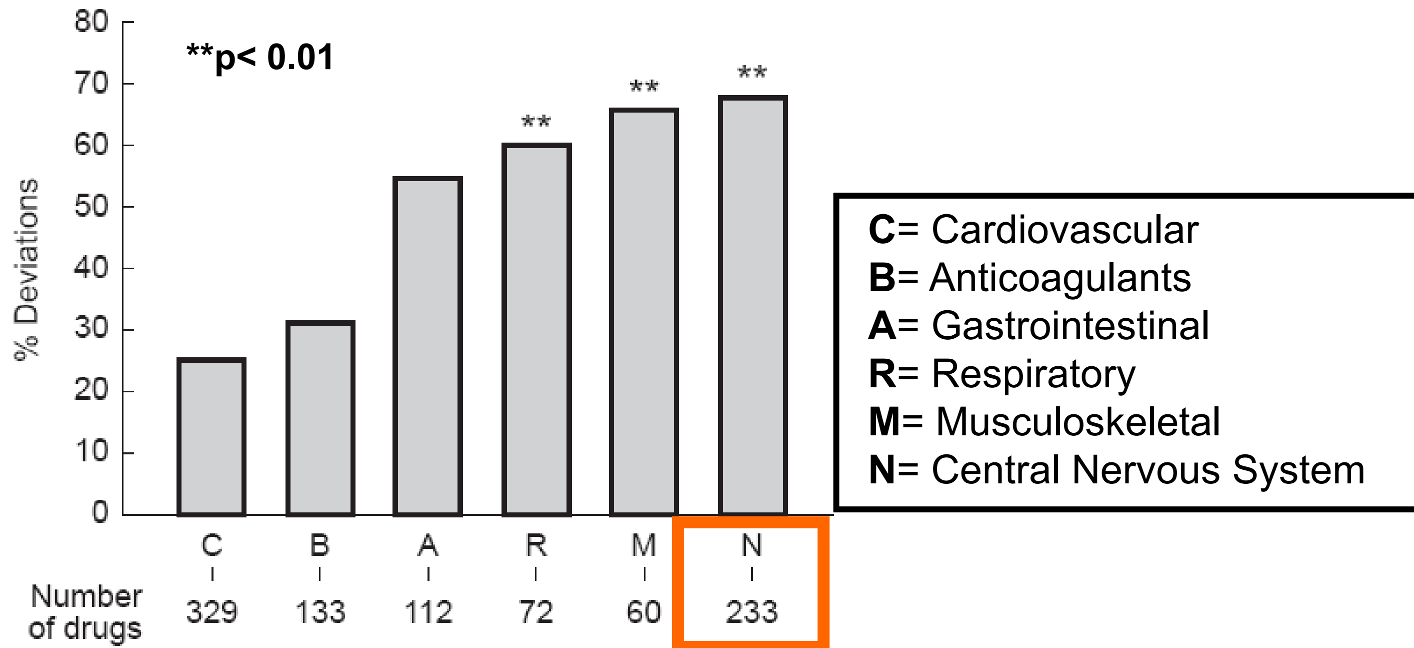
Drug therapy in the elderly: what doctors believe and patients actually do

n= 348 (age= 75 ys)

No of drugs= 1163 (mean 3.3, range 1±14)

I. Barat

Br J Clin Pharmacol, **51**, 615–622 2001



Falls in Patients with Dementia

Gait disorders

Postural instability

Poor coordination

Reduced attention

Psychomotor slowing

Prolonged reaction times

Sensory impairment

Neurological and cerebrovascular diseases

Behavioral symptoms

"… tutto porta a giustificare una caduta accidentale …"

… o è AGEISMO?

SOCIETÀ ITALIANA DI GERONTOLOGIA E GERIATRIA

Gruppo Italiano Sincope (GIS) - SIGG

Syncope and Dementia, a GIS Registry
SYD Registry

We enrolled patients with Syncope and Unexplained falls

Syncope and unexplained falls in older patients with dementia.

Results of the Syncope and Dementia registry - SYD

Table 4: Initial versus final diagnosis (n=357)

Initial	Final	% of initial
Suspected Syncope (n=181)	Syncope (n=158)	87.3
	Falls (n=10)	5.5
	Stroke (n=6)	3.3
	Epilepsy (n=4)	2.2
	Metabolic disorders (n=2)	1.1
	Drop attack (n=1)	0.6
Unexplained Falls (n=166)	Syncope (n=75)	45.2
	Falls (n=71)	42.8
	Stroke (n=13)	7.8
	Epilepsy (n=2)	1.2
	Metabolic disorders (n=4)	2.4
	Psychogenic attack (n=1)	0.6
Syncope and falls (n=10)	Syncope (n=9)	90.0
	Falls (n=1)	10.0

SYD registry

Ungar a. et al, JAGS 2016

Syncope and unexplained falls in older patients with dementia.

Results of the Syncope and Dementia registry - SYD

Table 5: Causes of Syncope (n=242)

Cardiac (n, %)	33 (13.6)
arrhythmic	25 (10.3)
structural	8 (3.3)
Reflex (n, %)	61 (25.2)
vasovagal	21 (8.7)
situational	26 (10.7)
carotid sinus syndrome	13 (5.4)
Atypical	1 (0.4)
Orthostatic (n, %)	117 (48.3)
primary autonomic failure	7 (2.9)
secondary autonomic failure	34 (14.0)
drug-induced	55 (22.7)
volume depletion	21 (8.7)
Unexplained (n, %)	31 (12.8)

SYD registry

Ungar a. et al, JAGS 2016

Syncope and unexplained falls in older patients with dementia.

Results of the Syncope and Dementia registry - SYD

Table 2: Drug used and paced patients at the moment of the event.

Overall drug therapy (n)	6.0 ± 2.9 (range 0-14)
Diuretics (n, %)	141 (39.5)
Beta blockers (n, %)	92 (25.8)
Statins (n, %)	91 (25.5)
Ca-channel blockers (n, %)	62 (17.4)
Antiarrhythmic (n, %)	55 (15.4)
Anticoagulants (n, %)	48 (13.4)
Nitrates (n, %)	45 (12.6)
Alpha blockers (n, %)	42 (11.8)
Cholinesterase-inhibitors (n, %)	[illegible]
Antiparkinsonians (n, %)	28 (7.8)
Memantine (n, %)	27 (7.6)
Anticonvulsants (n, %)	23 (6.4)
Levo-thyroxine (n, %)	21 (5.9)

Diuretics (n, %) 141 (39.5)
Beta blockers (n, %) 92 (25.8)

SYD registry

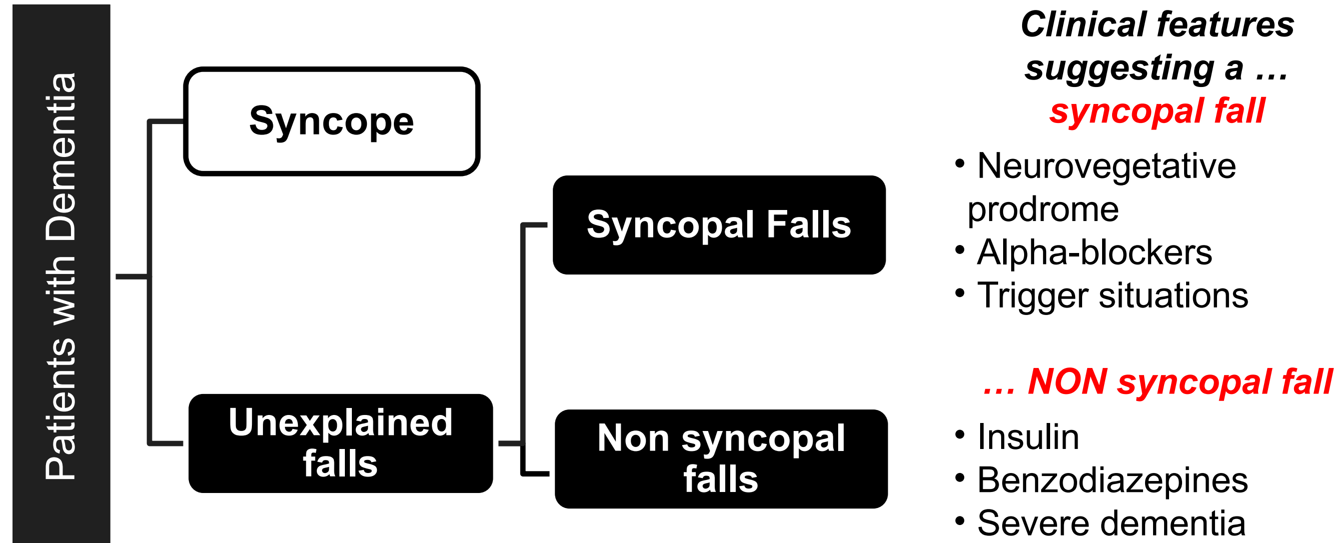
Ungar a. et al, JAGS 2016

Contents lists available at ScienceDirect
European Journal of Internal Medicine
journal homepage: www.elsevier.com/locate/ejim

Original Article

Differential diagnosis of unexplained falls in dementia: Results of "Syncope & Dementia" registry

Enrico Mossello[a], Alice Ceccofiglio[a], Martina Rafanelli[a], Angela Riccardi[a], Chiara Mussi[b], Giuseppe Bellelli[c], Franco Nicosia[d], Mario Bo[e], Daniela Riccio[f], Anna Maria Martone[g], Assunta Langellotto[h], Elisabetta Tonon[i], Gabriele Noro[j], Pasquale Abete[k], Andrea Ungar[a,*]



Clinical features suggesting a … syncopal fall

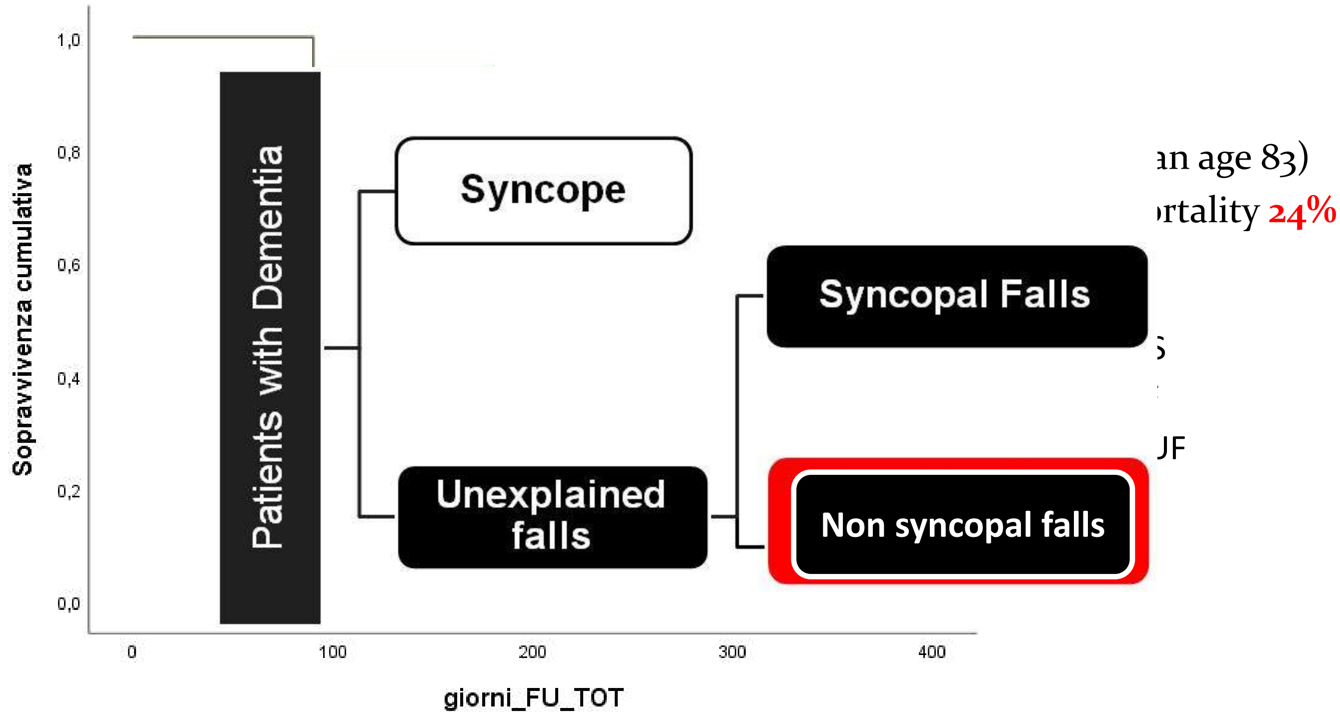
- Neurovegetative prodrome
- Alpha-blockers
- Trigger situations

… NON syncopal fall

- Insulin
- Benzodiazepines
- Severe dementia

Mossello E , Eur J Intern Med 2018

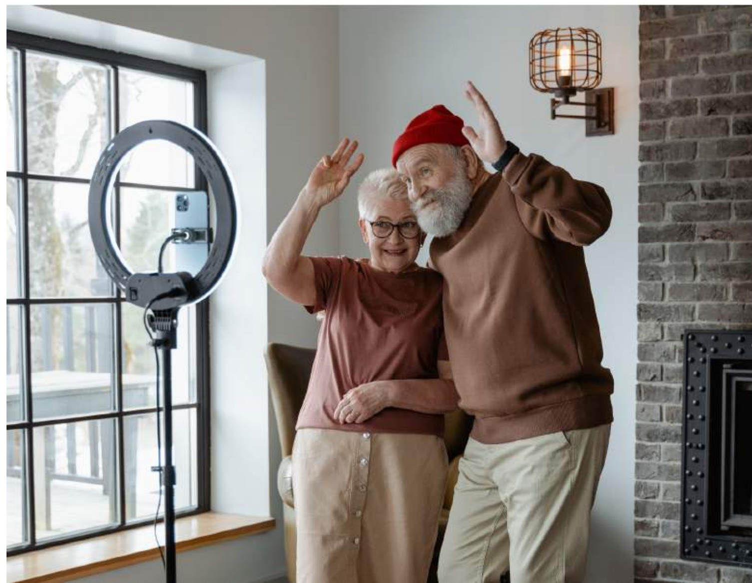
Truly Unexplained Fall (TUF) prognostic impact versus Confirmed Syncope (SC) and Syncopal Falls (SF)



Ceccofiglio A et al, unpublished data

MISERICORDIA
FIRENZE
AMBULATORI

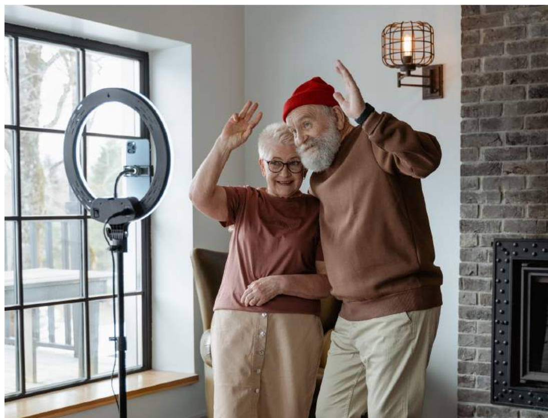
Invecchiare bene, invecchiare in salute
Nasce a Firenze il primo Centro anti-caduta



MISERICORDIA FIRENZE AMBULATORI

CAntA
Centro Anticaduta per l'Anziano

Invecchiare bene, invecchiare in salute
Nasce a Firenze il primo Centro anti-caduta



VALUTAZIONE MEDICA

- VISITA
- ELETTROCARDIOGRAMMA
- VALUTAZIONE PRESSIONE ARTERIOSA
- RICERCA IPOTENSIONE ORTOSTATICA
- VALUTAZIONE DI EQUILIBRIO E CAMMINO

VALUTAZIONE FISIOTERAPICA

- RIEDUCAZIONE FUNZIONALE ARTI INFERIORI
- EQUILIBRIO
- DEAMBULAZIONE
- RICONCILIAZIONE TERAPEUTICA

Valutazione multidimensionale
ECG + Prove ipotensione ortostatica
EO + Short Physical Performance Battery

Trattamento medico
Trattamento fisioterapico personalizzato*

Rivalutazione ambulatoriale

Syncope in older adults: challenges, approach and treatment

Age and Ageing 2024; **53:** 1–4
https://doi.org/10.1093/ageing/afad245

Sofie Jansen[1,2], Nathalie van der Velde[1,2]

Benefits of integrated approach

Because of this healthcare burden, timely recognition of the cause of syncope is necessary to allow appropriate treatment and reduce the proportion of syncope recurrence. Different specialties deal with TLOC, in particular cardiology, neurology and geriatric medicine. Specialists may focus on causes of syncope within their specialty alone, possibly leading to unnecessary diagnostic testing and referrals to other specialists. This may inadvertently increase costs and patient burden. Specialist services that are able to provide a comprehensive syncope assessment improve diagnostic yield, finding a cause of the syncopal event in over 90% of patients [3]. Compared with a diagnostic rate between 60 and 90% for conventional services, the use of an integrated service reduced number of unnecessary diagnostic tests and improved patient satisfaction [3].

For patients presenting with TLOC and/or neurologic deficits at the emergency department, a combined transient attack pathway with ED intervention linked to rapid access ambulant care systems showed reduced costs and length of stay [4].

Overlap syncope and falls

For physicians dealing with older adults presenting with falls, the overlap between syncope and falls can prove particularly challenging [5]. In older individuals with multiple risk factors for falls, cerebral hypoperfusion can lead to falls even when there is no TLOC. Furthermore, it is known that between half to two-thirds of patients with syncope have amnesia for loss of consciousness [5]. In patients with unexplained falls or in whom the history comprises red flags for potential syncope, such as absence of prodromes, known structural heart disease, ECG abnormalities, (pre)syncope in a supine position or during exertion and chest palpitations or chest pain before the event, warrant special attention to cardiovascular causes of their event [5, 6].

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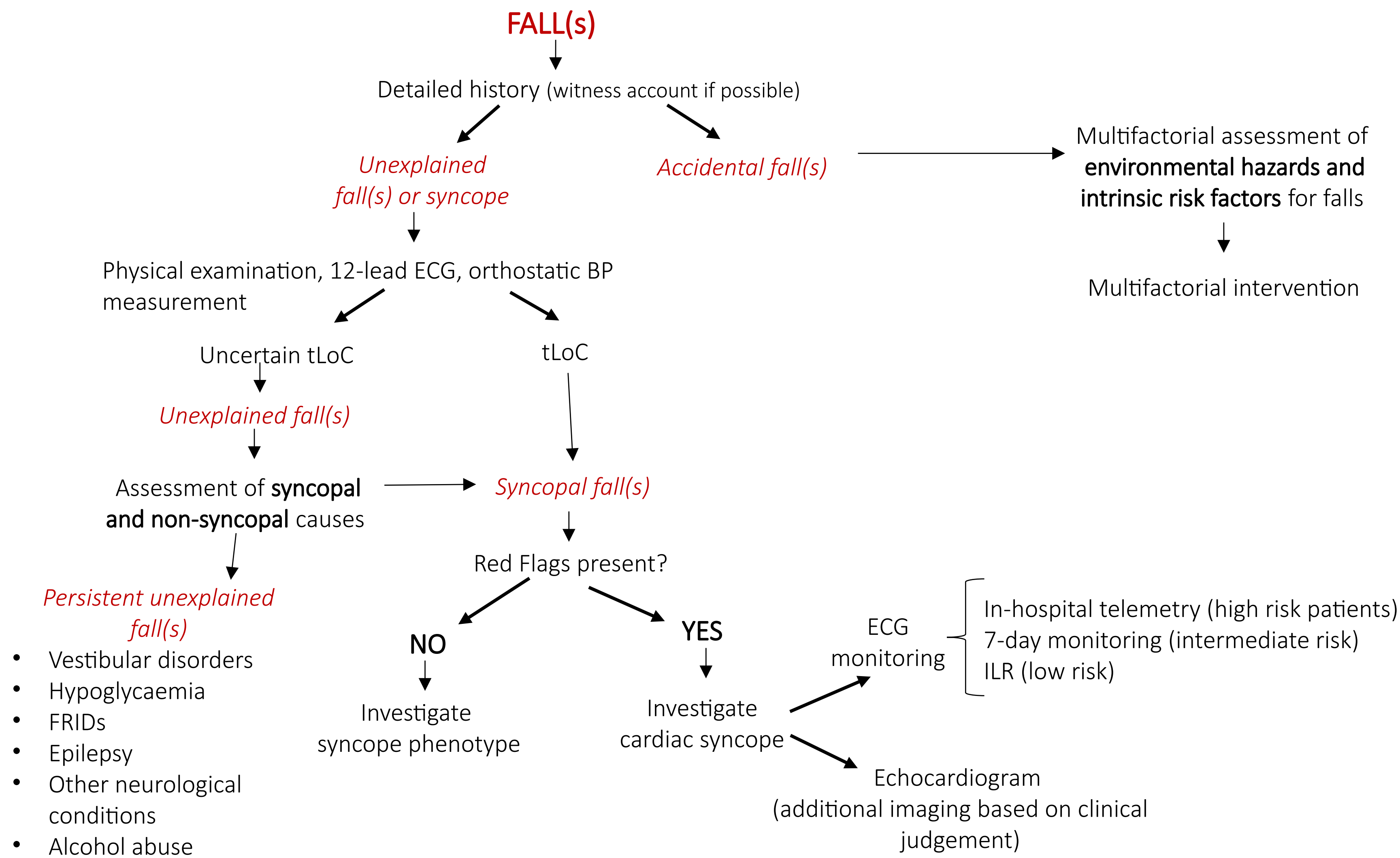
Diagnosi e terapia delle cadute a terra nell'anziano

Proviamo a mettere tutto insieme



Diagnostic pathway (I)
FALL(s)
Detailed history (witness account if possible)
Unexplained fall(s) or syncope
Accidental fall(s)
Multifactorial assessment of environmental hazards and intrinsic risk factors for falls
Multifactorial intervention
Physical examination, 12-lead ECG, orthostatic BP measurement
Uncertain tLoC
tLoC
Unexplained fall(s)
Assessment of syncopal and non-syncopal causes
Syncopal fall(s)
Red Flags present?
Persistent unexplained fall(s)
• Vestibular disorders
• Hypoglycaemia
• FRIDs
• Epilepsy
• Other neurological conditions
• Alcohol abuse
NO
Investigate syncope phenotype
YES
Investigate cardiac syncope
ECG monitoring
In-hospital telemetry (high risk patients)
7-day monitoring (intermediate risk)
ILR (low risk)
Echocardiogram (additional imaging based on clinical judgement)

Multifactorial approach

In older adults, multiple causes of falls may be present and a multifactorial diagnostic and treatment approach is recommended, particularly in subjects with neurodegenerative disorders.
The following risk factors for falls should be carefully assessed in **recurrent fallers**

To be assessed	Risk factors	Possible intervention strategies
Physical performance	• Gait disorders (gait speed ≤0.8 m/s) • Balance impairment • Sarcopenia	• Environmental hazard reduction • Exercise and muscle strengthening • Use of walking aid • Nutrition assessment and intervention
Sensory deficits	• Vision loss • Hearing impairment • Vestibular disorders	• Glasses • Hearing aids • Vestibular rehabilitation
Fall-risk increasing drugs	• Antihypertensive drugs • Antidiabetic drugs • Psychoactive drugs • Antihistamines • Opioids • L-dopa and dopamine agonists	• Structured medication review and deprescribing (dose reduction or withdrawal) • Deprescribing of hypotensive meds in hypotensive phenotype
Orthostatic blood pressure response	Orthostatic hypotension	• Hydration • Muscle strengthening • Medication review

When to consider referral to a Syncope and Fall unit for specialist comprehensive assessment

- Recurrent and/or unexplained falls or syncope (i.e., two or more episodes in the previous year)
- Injurious syncope

Dictionary

Term	Definition
Fall	Unexpected event in which an individual comes to rest on the ground, floor, or lower level
Syncope	Transient loss of consciousness (LOC) due to transient global cerebral hypoperfusion and characterized by rapid onset, short duration, and spontaneous complete recovery
Persistent Unexplained fall	Fall which remains of unexplained origin after accidental causes and a diagnosis of syncope have been excluded the diagnostic work-up
Prodrome	Any symptom preceding LOC. It might be cardiac (chest pain, dyspnea, palpitations) or autonomic (nausea, blurred vision, lightheadedness, weakness, sweating). Atypical/absent prodrome are common in older adults
Orthostatic hypotension	Reduction in systolic blood pressure of ≥20mmHg (or <90 mmHg) or diastolic blood pressure of ≥10mmHg within 3 minutes of standing. Its prevalence achieves 30% in community-dwelling older adults and approximately 50% in hospitalized patients and in older adults with dementia. It represents the most common cause of syncope at old age
Hypotensive phenotype	Syncope with predominant hypotensive mechanism. It typically occurs in patients with persistently low blood pressure and/or intermittent hypotension, i.e., orthostatic hypotension, post-prandial hypotension and other hypotensive episodes. It may be constitutional or drug-related (i.e., deriving from blood pressure lowering below the recommended target).
Bradycardic phenotype	Syncope with asystole as the predominant mechanism.
Syncope and Fall Unit	Facility featuring a standardized approach to the diagnosis and management of t-LOC and falls, with specialist staff and access to evidence-based diagnostics and therapies. Different models exist depending on service practices and availability of resources. It has been demonstrated to improve syncope diagnosis while reducing syncope-related hospital admissions

Grazie per la vostra attenzione
elena tempestini