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Review Article

Falls in Older Adults in Acute Care Settings: Frailty, Sarcopenia, Clinical Decision-Making, and Prevention Strategies

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Abstract

Falls are a leading cause of injury-related morbidity and mortality in adults aged 65 years and older, and their incidence continues to rise despite prevention efforts. In emergency and inpatient care, a fall should prompt more than injury assessment; it may reflect frailty, delirium, medication toxicity, acute physiological decompensation, or social vulnerability. This narrative review examines the epidemiology and mechanisms of falls in older adults across acute care settings, together with risk assessment, post-fall clinical decision-making, and prevention, drawing on guidelines, systematic reviews, meta-analyses, and observational studies. Falls in these settings usually have multiple contributors, including frailty, sarcopenia, delirium, cognitive impairment, polypharmacy, and orthostatic hypotension. Scored risk tools have limited accuracy when used alone, particularly in the emergency department, and should be interpreted within a broader clinical assessment that considers injury, precipitating cause, geriatric status, and disposition together. The most consistent benefit appears to come from programs combining delirium prevention, medication review, staff education, and supervised mobilization. Unresolved issues include the lack of an emergency-department-specific tool validated for routine use, limited attention to the post-discharge period, and the exclusion of patients with advanced frailty or active delirium from many trials.

Keywords: Falls, Frailty, Sarcopenia, Emergency department, Older adults

Introduction

Falls are among the most common and clinically consequential events in adults aged 65 and older. In the United States, roughly 27.5% of community-dwelling older adults report at least one fall each year, generating about three million emergency department (ED) visits and more than 950,000 hospitalizations annually[1,2]. In 2021, 38,742 older adults died from unintentional falls, corresponding to a rate of 78.0 per 100,000[2]. Associated costs to the US health system are estimated at $80 billion annually[3].

In hospital and emergency settings, a fall raises several clinical issues at the same time. It is an injury that requires

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prompt assessment, but it may also reveal underlying physiological decompensation and independently predicts later functional decline, institutionalization, and death[4,5]. Sometimes the fall is the first visible sign of infection, dehydration, medication toxicity, orthostatic hypotension, or emerging frailty — diagnoses that may be missed by a trauma-focused work-up[4]. Viewed in this context, a fall should be treated as a potential early marker of frailty, prompting comprehensive assessment and management rather than treatment of the injury alone.

That fall-related mortality keeps climbing even as prevention programs proliferate suggests our current strategies are not reaching the highest-risk patients: those who are frail or cognitively impaired, who have just been discharged, or who lack support at home. Part of the problem lies in the tools themselves. Most were built and validated in community or stable inpatient populations, and they perform poorly in the ED, where acute illness, time pressure, and incomplete baseline information sharply limit their utility[6,7].

This review focuses on falls in older adults in emergency and hospital care, with bedside decision-making kept in view. It is intended as a bedside-oriented synthesis for emergency physicians, geriatricians, and acute care teams assessing older adults after a fall, and it also identifies the evidence gaps most in need of further study.

Methods

A structured but non-systematic literature search was conducted in PubMed/MEDLINE, Scopus, Web of Science, and Google Scholar using combinations of the following terms: “falls,” “older adults,” “geriatrics,” “emergency department,” “acute care,” “hospital falls,” “fall risk,” “fall prevention,” “frailty,” “delirium,” “polypharmacy,” “sarcopenia,” and “comprehensive geriatric assessment.” The final literature search was completed in June 2026. Priority was given to clinical guidelines, systematic reviews, meta-analyses, randomized controlled trials (RCTs), and high-quality observational studies from the past 10–15 years; landmark older references were retained where they provided essential clinical context. As a narrative rather than systematic review, we did not apply a formal protocol, predefined eligibility criteria, or quantitative pooling; we synthesized the evidence thematically, given the heterogeneity of populations, settings, interventions, and outcome definitions across included sources.

Epidemiology and Clinical Impact

The consequences of a fall often extend well beyond the initial event. Only about one in five falls causes a fracture or head injury, yet functional decline, loss of independence, and post-fall syndrome — the persistent fear of falling again — can be just as disabling[1]; indeed, post-fall syndrome limits mobility and self-care about as much as recurrent falls do[1]. In a prospective study of 452 older adults seen in EDs after a fall, 29.6% had clinically meaningful functional decline at 180 days, the strongest predictors being age over 85, fracture, hospitalization, and post-fall syndrome[8]. Even patients discharged with seemingly minor injuries remain at risk: many still show lasting functional decline at six months, driven more by their underlying vulnerability than by injury severity[8].

The economic toll is large as well. US fall-related spending reached an estimated $80 billion in 2020[3], and fall injuries rank among the leading reasons for 30-day Medicare readmission[9]. Within hospitals, fall rates run from 1.5 to 9.0 per 1,000 patient-days — highest on neurological and medical wards — and 25%–50% of inpatients who fall are injured[10]. The acute injury alone therefore does not define the severity or prognosis of a fall.

Pathophysiology and Risk Factors

Falls in older adults arise from the convergence of intrinsic physiological vulnerability, extrinsic environmental hazards, medication effects, and acute precipitating events[5]. The hospital environment amplifies this interplay: illness, pain, disorientation, sleep disruption, and rapid medication changes each add to a preexisting risk burden.

A meta-analysis of 119 studies identified prior falls as the single strongest predictor of in-hospital falls (odds ratio [OR] 2.54; 95% confidence interval [CI] 1.63–3.96)[10]. Among specific medication classes, antidepressants (OR 2.25), benzodiazepines (OR 1.97), hypnotics and sedatives (OR 1.90), and antipsychotics (OR 1.61) each conferred substantial independent risk[10].

Frailty occupies a central role in fall risk assessment. Current guidelines identify it as approximately doubling the risk of recurrent falls, with pre-frailty conferring roughly a 30% increase[11]. Kim and Rockwood emphasize that frailty assessment should reflect the patient’s baseline functional status prior to the acute presentation, not the acutely deteriorated state[12]. Among older adults presenting after ground-level falls, frailty is associated with 75% higher odds of mortality and 49% higher odds of readmission[13]. In the ED, the Clinical Frailty Scale (CFS) improves risk prediction when combined with vital-sign-based scores such as the quick Sequential Organ Failure Assessment (qSOFA), National Early Warning Score 2 (NEWS2), or Rapid Emergency Medicine Score (REMS)[14]. An international Delphi consensus recommends that frailty screening in the ED reflect the patient’s baseline status in the two to four weeks before presentation and be completed within four hours of arrival[15].

Delirium is among the strongest and most underrecognized fall risk factors in hospitalized older adults. A systematic review found a median risk ratio of 4.5 across studies, with one multivariate analysis reporting an OR of 7.33[16]. The relationship is bidirectional: delirium precipitates falls through impaired attention, agitation, and psychoactive medication effects, while head injury

Category	Risk factor	Effect estimate	Ref.
Previous falls	Fall in prior 12 months	OR 2.54 (95% CI 1.63–3.96)	10
Medications	Antidepressants	OR 2.25	10
Medications	Benzodiazepines	OR 1.97	10
Medications	Hypnotics/sedatives	OR 1.90	10
Medications	Antipsychotics	OR 1.61	10
Frailty	Frailty (vs. robust)	~2× recurrent fall risk	11
Delirium	Delirium (in-hospital)	Median RR 4.5; OR up to 7.33	16
Neurological	Parkinson disease / prior stroke	OR 3.79 / OR 2.94	1
Cognitive	Dementia / cognitive impairment	OR 2.03 (ED/hospital attendance)	1
Sarcopenia	Sarcopenia (adults ≥80 years)	~3× 2-year fall risk	11
Anticholinergic burden	High anticholinergic cognitive burden	Independent predictor	17
Extrinsic/iatrogenic	Hospital hazards (catheters, IV lines, wet floors)	—	5

CI: confidence interval; ED: emergency department; IV: intravenous; OR: odds ratio; RR: risk ratio.

Table 1. Key risk factors for falls in older adults in acute care settings, organized by category.

from a fall can itself trigger delirium. Despite this, delirium is absent from most validated fall risk instruments — a significant gap in clinical practice[16].

Other well-documented risk factors include sarcopenia (approximately threefold increase in two-year fall risk; present in roughly 25% of adults aged ≥80 years), Parkinson disease, prior stroke, dementia, orthostatic hypotension, depression, visual impairment, urinary urgency, and chronic pain[1,11]. Sarcopenia, the age-related loss of skeletal muscle mass and strength, contributes to fall risk by impairing gait and balance and reducing functional reserve, and it commonly overlaps with frailty[11]. No single factor operates in isolation; the interaction among these conditions shapes each patient's individual risk trajectory.

Polypharmacy and Medication Risk

Polypharmacy (≥4 concurrent medications) is consistently linked to falls and is one of the most modifiable risk factors in the acute care setting. The European STOPPFall tool identifies 14 fall-risk-increasing drug (FRID) classes, with psychotropic agents predominating, and current American Geriatrics Society (AGS) falls guidance endorses systematic FRID assessment[17,18]. A high anticholinergic cognitive burden has also been associated with serious in-hospital falls, and AGS guidance recommends assessing fall risk before prescribing any FRID and integrating deprescribing into multidomain prevention[17].

Extrinsic and Iatrogenic Factors

Environmental hazards — poor lighting, loose flooring, inappropriate footwear, absent assistive devices — contribute meaningfully to fall risk in both home and hospital settings[5]. Within the hospital, tethering devices (urinary catheters, intravenous [IV] lines, telemetry leads), disrupted sleep-wake cycles, and enforced bed rest compound baseline vulnerability. A persistent tension exists between early mobilization — which reduces deconditioning and hospital length of stay — and the institutional impulse to restrict movement in high-risk patients. This tension is exacerbated where serious in-hospital falls are classified as never events, creating incentive structures that may paradoxically discourage the ambulation that would benefit patients most[9].

Table 1 summarizes the major risk factors organized by domain, with associated effect estimates.

Risk Assessment in Acute Care

Despite the proliferation of fall risk instruments, a 2025 systematic review and meta-analysis of 53 studies (21,554 older adults) concluded that no single tool achieves adequate standalone diagnostic accuracy[6]. The 2022 World Guidelines explicitly recommend against using scored tools as the primary assessment method in hospitalized older adults, calling instead for comprehensive clinical evaluation in all patients aged ≥65[11]. A Cochrane review corroborates this position, finding that scored tools compared with nurses' clinical judgment alone produce little or no difference in fall rates (moderate-certainty evidence)[19].

Among commonly used instruments, the Morse Fall Scale combined with the Barthel Index achieves an area under the receiver operating characteristic curve (AUC) of 0.891 in patients aged ≥80 years; STRATIFY yields

Tool	Setting validated	Diagnostic performance	Key limitations
EHR-integrated score, 9-item [21]	ED	AUC 0.75 for 6-month fall prediction[21]	Single-center study; external validation required
Morse Fall Scale[22]	Acute inpatient	AUC 0.813 alone; 0.891 combined with Barthel Index[6]	Does not capture delirium or acute illness severity
STRATIFY[23]	Acute inpatient	AUC 0.754 [6]	Not validated in ED populations
Hendrich II Fall Risk Model[24]	Inpatient	AUC 0.734 [6]	Does not account for acute medication changes
Timed Up and Go[25]	Community / inpatient	Sensitivity 0.31; specificity 0.74[17]	Impractical in acutely ill or non-ambulatory patients
STEADI, CDC initiative[26]	Community / ED	Composite score ≥4 did not predict 6-month outcomes[20]	Individual items outperform composite score in ED
Clinical Frailty Scale, CFS[27]	ED	Improves AUC vs. qSOFA, NEWS2, or REMS alone[14]	Acute illness may impair baseline functional status estimation

AUC: area under the receiver operating characteristic curve; CDC: Centers for Disease Control and Prevention; CFS: Clinical Frailty Scale; ED: emergency department; EHR: electronic health record; STEADI: Stopping Elderly Accidents, Deaths and Injuries.

Table 2. Comparison of major fall risk assessment tools used in acute care settings.

Domain	Key clinical elements
Fall history	Previous falls; recurrence pattern; circumstances; time spent on the floor
Injury	Head trauma; fracture; pain level; anticoagulation status; neurological signs
Acute illness	Infection; dehydration; anemia; hypoglycemia; arrhythmia; syncope
Frailty/function	Baseline ADLs; gait aid use; recent functional trajectory
Cognition	Known dementia; delirium screening; attention; safety awareness
Medication risk	Psychotropics; opioids; antihypertensives; anticholinergics; hypoglycemics
Social context	Living alone; caregiver availability; home safety; capacity to follow a discharge plan

Original table created by the authors based on the synthesis of the evidence reviewed in this article. ADLs: activities of daily living.

Table 3. Recommended domains for structured fall risk assessment in acute care settings.

Phase	Key clinical actions
1. Immediate stabilization	ABCDE approach if hemodynamically unstable; analgesia; identification of major trauma; confirmation of anticoagulation status
2. Injury evaluation	Head and cervical spine assessment; fracture evaluation; imaging per clinical risk; individualized protocol for anticoagulated patients
3. Causal investigation	Distinguish gait- and balance-related from unexplained or syncopal fall; evaluate for infection, metabolic disturbance, arrhythmia, and medication toxicity; ECG when clinically indicated
4. Geriatric assessment	Baseline ADLs; CFS frailty rating (reflecting pre-illness status, 2–4 weeks prior); delirium screening; mobility and transfer capacity; social support and home environment
5. Disposition planning	Get up and go safety check; admission criteria review; referrals to PT, OT, pharmacist, and social work as indicated; initiate delirium prevention protocol if admitted
6. Prevention planning	Systematic medication review and deprescribing (STOPPFall; AGS deprescribing guidance); supervised mobilization plan; home hazard assessment; structured follow-up with primary care or geriatrics

Original table created by the authors based on the synthesis of the evidence reviewed in this article. ABCDE: airway, breathing, circulation, disability, exposure; ADLs: activities of daily living; AGS: American Geriatrics Society; CFS: Clinical Frailty Scale; ECG: electrocardiogram; OT: occupational therapy; PT: physical therapy; STOPPFall: Screening Tool of Older Persons Prescriptions in Older Adults With High Fall Risk.

Table 4. Sequential clinical framework for the management of older adults presenting after a fall in acute care.

Intervention	Setting	Key evidence	Evidence quality / guidance
Patient and staff education	Acute hospital	Rate ratio 0.70 (95% CI 0.51–0.96); OR 0.62 (95% CI 0.47–0.83)[36]	Moderate; single-component intervention with the most consistent benefit
Multifactorial intervention	Subacute hospital	Rate ratio 0.67 (95% CI 0.54–0.83)[19]	Moderate; greater effect in subacute than acute ward settings
Multicomponent delirium prevention (HELP model)	Acute/subacute hospital	Associated with reduced delirium incidence and in-hospital falls[37,38]	Moderate; cost-effective; frequently underutilized
Comprehensive geriatric assessment (CGA)	Hospital medical wards	RR 0.51 (95% CI 0.29–0.89) for falls[39]	High (umbrella review); resource-intensive
Deprescribing of FRIDs (Shed-MEDS RCT)	Hospital and post-acute care	Reduced PIMs and anticholinergic burden at 90 days[40]	Moderate; STOPPFall and AGS deprescribing guidance recommended[17,18]
Exercise: gait, balance, and functional training	Community	OR 0.51 (95% CI 0.33–0.79) for injurious falls[42]	High; USPSTF Grade B recommendation[41]
Exercise combined with vision assessment	Community	OR 0.17 (95% CI 0.07–0.38)[42]	High; largest effect estimate in that network meta-analysis
Home hazard modification	Post-discharge	RR 0.63 (95% CI 0.43–0.93) in patients with prior falls[43]	Low quality; benefit limited to those with prior fall history
Unsupervised home exercise (post-discharge)	Post-discharge	OR 1.74 (95% CI 1.17–2.60) increase in fallers[43]	Avoid in recently hospitalized, deconditioned patients
Vitamin D 800–1,000 IU/day	Deficient adults / care facilities	RR 0.85 in those with deficiency[44]	Moderate in deficient/ institutionalized patients; not recommended universally[45]
Bed alarms and scored risk tools (standalone)	Acute hospital	No significant fall reduction[36]	Not recommended as standalone interventions
Wearable/digital fall detection (for prevention)	Various	Prevention evidence insufficient[47]	Conditional recommendation against for prevention; GRADE 2C[11]

AGS: American Geriatrics Society; CGA: comprehensive geriatric assessment; CI: confidence interval; FRIDs: fall-risk-increasing drugs; GRADE: Grading of Recommendations Assessment, Development and Evaluation; HELP: Hospital Elder Life Program; OR: odds ratio; PIMs: potentially inappropriate medications; RR: risk ratio; USPSTF: US Preventive Services Task Force.

Table 5. Summary of fall prevention strategies relevant to acute and peri-acute care settings.

an AUC of 0.754 in inpatient settings but has not been validated in EDs; and the Hendrich II reaches 0.734 but fails to capture illness severity and acute medication changes[6]. The Timed Up and Go test shows higher specificity (0.74) than sensitivity (0.31) and is impractical for acutely ill or non-ambulatory patients[17]. In an ED context, a composite STEADI (Stopping Elderly Accidents, Deaths and Injuries) score ≥4 did not predict six-month adverse outcomes, whereas seven individual questions across three domains — prior falls, physical activity limitation, and high-risk medications — were each independently predictive[20]. This suggests that targeted item-level inquiry may outperform composite scoring in the ED.

Table 2 provides a comparison of major fall risk assessment tools, including validation settings, diagnostic performance, and key limitations.

Emerging Approaches to Risk Stratification

A recent prospective cohort study integrated electronic health record (EHR) data with brief ED-based screening to develop a nine-item score that achieved an AUC of 0.75 for six-month fall prediction; the strongest predictors were anemia, oral hypoglycemic use, living alone, infrequent home departures, and a history of three or more falls[21]. Despite this progress, the GEAR Network concluded that none of the tools studied in ED settings are simultaneously feasible and accurate for routine use, and identified a validated ED-specific tool as the field's foremost research priority[7].

Table 3 outlines the recommended clinical domains for structured fall risk assessment — the approach endorsed by current guidelines when scored tools are used to organize clinical thinking rather than as standalone decision thresholds.

Clinical Decision-Making After a Fall

Evaluating an older adult after a fall involves three parallel clinical objectives: diagnosing and managing acute injuries, identifying the precipitating cause, and stratifying risk to guide safe disposition. These objectives are not sequential — each informs the others and should be addressed concurrently.

Injury Evaluation and Imaging

Physical examination alone is unreliable in this population. False-negative rates reach approximately 38% for head injuries and up to 80% for cervical spine injuries, supporting a low imaging threshold[28]. Consensus guidelines recommend head computed tomography (CT) in all older adults with head trauma — including those reporting minor injury — because intracranial injury without overt neurological signs occurs in approximately 3% of cases[28].

The management of anticoagulated patients after head trauma is an area of genuine guideline discordance. Intracranial hemorrhage is identified in approximately 3.9%–5.0% of older adults after ground-level falls; antithrombotic therapy, while not consistently linked to higher rates of initial hemorrhage, is significantly associated with hematoma expansion on follow-up imaging (26.2% vs. 4.8%)[29,30]. Delayed hemorrhage after a negative initial CT is uncommon and rarely requires neurosurgical intervention[29,30]. The 2023 American College of Emergency Physicians (ACEP) Clinical Policy does not recommend routine repeat CT or extended observation when the initial scan and neurological examination are both normal[31], whereas European trauma guidelines favor 24-hour observation with repeat imaging in anticoagulated patients[28]. This discordance reflects genuine residual uncertainty; individualized clinical judgment is appropriate.

Identifying the Underlying Cause

The Geriatric ED Guidelines propose a useful clinical heuristic: would a healthy young adult have fallen in the same circumstances?[4] A negative answer should prompt a systematic search for an underlying precipitant. Fall dynamics provide diagnostic cues. In the study cited here, falls from standing — defined as secondary to syncope, lipothymia, drop attack, or vertigo — were associated with higher admission rates despite lower fracture prevalence, whereas accidental falls — defined as interaction with environmental hazards while in motion — were associated with greater odds of fracture (OR 4.05; 95% CI 3.10–5.29)[32]. Syncopal presentations require cardiac and neurological evaluation; gait- and balance-related falls require injury assessment alongside evaluation of gait, balance, medications, and environmental contributors.

Time spent on the floor should always be documented, as prolonged immobility can precipitate rhabdomyolysis, dehydration, hypothermia, pressure injury, and delirium. Precipitants to evaluate systematically include infection, hypoglycemia, electrolyte disturbance, anemia, arrhythmia, and medication toxicity — each capable of presenting primarily as a fall in an older patient with limited physiological reserve.

Disposition Planning

Disposition decisions in older fallers are inherently biopsychosocial. In a study of 42,392 ED visits, difficulty with five activities of daily living (ADLs) was associated with an 8.5-percentage-point increase in the probability of admission, and dementia with a 4.6-percentage-point increase; living with a spouse and having children living within 10 miles were associated with decreases of 3.9 and 5.0 percentage points, respectively[33]. In the same study, polypharmacy, incontinence, depression, and a fall in the preceding two years were not meaningfully associated with the probability of admission[33]; however, polypharmacy was associated with ward admission in another cohort of older adults presenting to the ED after a fall[32]. The American College of Surgeons recommends frailty assessment at presentation because it informs both prognosis and early resource allocation[34].

Before discharge, the Geriatric ED Guidelines recommend a brief "get up and go" safety check: patients unable to rise, turn, and ambulate steadily should be reassessed, with admission considered if safe discharge cannot be ensured[4]. Frailty and prior fall history are among the strongest predictors of 30-day readmission[13]. A 2025 quality improvement study showed that pharmacist-led medication review — arguably the highest-yield single component of a multimodal ED intervention — was delivered to only 15.2% of patients, compared with >93% who received physical or occupational therapy assessment[35], highlighting a persistent gap in pharmacological management at the point of care.

Table 4 presents a sequential clinical framework for managing older adults after a fall in the ED or acute ward.

Prevention Strategies

Effective fall prevention requires multicomponent approaches that address patient, provider, pharmacological, and environmental domains simultaneously. No single measure — a screening score, a bed alarm, or a medication change — is sufficient alone, and prevention activities are most durable when embedded in routine workflows rather than applied as add-on programs.

Hospital-Based Interventions

A 2022 systematic review and meta-analysis of 43 hospital-based studies found that patient and staff education was the only single-component intervention associated with significant reductions in both fall rates (rate ratio 0.70; 95% CI 0.51–0.96) and fall odds (OR 0.62; 95% CI 0.47–0.83)[36]. Bed alarms, alert systems, and scored risk tools used in isolation produced no significant reduction[36]. Multifactorial interventions demonstrate more consistent

benefit in subacute than in acute ward settings (rate ratio 0.67 vs. 0.80)[19]. Programs with documented effectiveness share common structural features: institutional leadership, multidisciplinary oversight, regular data review, and a ward culture that treats safe mobilization as a therapeutic goal[36].

Delirium Prevention as a Fall Prevention Strategy

Multicomponent nonpharmacological delirium prevention is plausibly one of the most underutilized fall prevention strategies available in acute care. Protocols modeled on the Hospital Elder Life Program (HELP) — combining early mobilization, orientation, hydration, sleep promotion, sensory optimization, and avoidance of deliriogenic medications — have been associated with reductions in both delirium incidence and in-hospital falls[37,38]. Because delirium and falls share several causal pathways, the potential magnitude of fall reduction achievable through delirium prevention may approach that of dedicated fall prevention interventions, although direct comparative data remain limited. Such protocols nonetheless remain inconsistently implemented, particularly in EDs and acute wards where delirium is most prevalent.

Comprehensive Geriatric Assessment

Comprehensive geriatric assessment (CGA) is a multidimensional, interdisciplinary process that evaluates an older person's medical, functional, cognitive, psychological, nutritional, and social circumstances and translates those findings into a coordinated plan of treatment and follow-up[39]. This approach matches the multifactorial nature of falls and brings together the clinical domains summarized in Table 3 and step 4 of the post-fall pathway in Table 4.

An umbrella review of 31 systematic reviews (279,744 participants) found high-certainty evidence that CGA reduces falls in hospital medical settings (RR 0.51; 95% CI 0.29–0.89); it also reported lower nursing home admission (RR 0.86), pressure ulcer incidence (RR 0.46), and delirium risk in patients with hip fracture (OR 0.71)[39].

Assessment and management are linked within CGA because the findings are used to formulate the care plan. After a fall, that plan can integrate medication review and deprescribing of fall-risk-increasing drugs[17,18,40], delirium prevention[37,38], gait and mobility assessment, correction of sensory and environmental contributors, and discharge planning[4,5]. In acute care, full CGA may be limited by time and staffing; a staged model beginning with early screening for baseline frailty and functional or cognitive vulnerability, followed by targeted multidisciplinary assessment and management, is a practical approach in the ED[4,7,12,15].

Medication Review and Deprescribing

Systematic FRID identification and deprescribing is endorsed by all major fall prevention guidelines[11,17,18]. The Shed-MEDS RCT demonstrated that a patient-centered deprescribing intervention started at hospital discharge and continued through post-acute care significantly reduced total medications, potentially inappropriate medications, and anticholinergic burden at 90 days, with no increase in adverse outcomes[40]. The STOPPFall tool offers structured deprescribing guidance for 14 FRID classes[18]. In the ED, the primary barrier is not identifying high-risk medications but acting on them; available evidence consistently shows that pharmacist-led deprescribing is underdelivered relative to rehabilitative interventions[35].

Community-Based and Post-Discharge Interventions

For community-dwelling older adults, exercise targeting gait, balance, and functional performance is among the most robustly supported strategies, reducing injurious falls (OR 0.51; 95% CI 0.33–0.79). In its 2024 recommendation statement, the US Preventive Services Task Force (USPSTF) recommends exercise interventions to prevent falls in community-dwelling adults aged 65 years or older at increased risk (Grade B) and advises individualizing the decision to offer multifactorial interventions (Grade C)[41,42]. A network meta-analysis of 283 RCTs identified combined exercise plus vision assessment as the combination with the largest effect estimate in that analysis (OR 0.17; 95% CI 0.07–0.38)[42].

The post-discharge period presents an important paradox. Home exercise programs increased the proportion of fallers in recently discharged older adults (OR 1.74; 95% CI 1.17–2.60)[43], most likely because unsupervised activity elevation exposes newly deconditioned patients to fall risk without adequate balance training. Home hazard modification, by contrast, reduces falls in those with a prior fall history (RR 0.63; 95% CI 0.43–0.93)[43]. For recently hospitalized patients, unsupervised home exercise is therefore inadvisable; supervised, balance-focused rehabilitation should be the discharge goal.

Vitamin D: Evidence and Clinical Position

Vitamin D supplementation for fall prevention remains a source of guideline discordance. The 2024 USPSTF falls-prevention recommendation addresses exercise and multifactorial interventions but does not address vitamin D supplementation[41], while the World Guidelines (2022) support supplementation for those with confirmed deficiency as part of a multidomain strategy[11]. A 2024 network meta-analysis of 35 RCTs found that 800–1,000 IU/day reduced fall risk (RR 0.85; 95% CI 0.74–0.95) only in individuals with baseline 25-hydroxyvitamin D ≤50 nmol/L; high-dose supplementation (>1,000 IU/day) was associated with increased fall risk[44]. The 2024 Endocrine Society guideline observed that the fall-reduction signal was largely confined to high-risk-of-bias studies[45]. An earlier USPSTF recommendation had advised against vitamin D supplementation for fall prevention in community-dwelling adults aged 65 years or older who are not known to have osteoporosis or vitamin D deficiency[46]. Supplementation

at 800–1,000 IU/day is reasonable for older adults with documented deficiency, particularly those in care facilities, but should not be deployed as a universal strategy[11,44].

Technology-Based Interventions

Wearable fall detection devices achieve high technical performance, and telehealth combined with exercise has been associated with reduced fall risk in systematic evidence[47]. The World Guidelines nonetheless issue only a conditional recommendation against wearables specifically for fall prevention (GRADE 2C), noting that most evidence addresses detection rather than prevention, and that validation in frail and cognitively impaired populations remains limited[11,47]. Digital health technologies represent a promising research area, but their role in routine clinical fall prevention has yet to be established.

Table 5 summarizes the major prevention strategies relevant to acute and peri-acute care, with evidence quality and implementation considerations.

Discussion

Taken together, the evidence on epidemiology, risk assessment, post-fall evaluation, and prevention points to several practical messages that single-domain guidelines tend to cover only in part.

The clearest signal from the risk-assessment literature is that no scored tool performs adequately on its own, particularly in the ED[6,19]. Although such scores are widely embedded in hospital policy, they rarely outperform structured clinical judgment. They are more useful as prompts that organize a clinician's thinking than as numerical thresholds that determine care. The finding that individual STEADI items outperformed the composite score in ED patients[20] supports the same interpretation: in a time-pressured setting, targeted questions may be more informative than a composite total. Models that draw on existing EHR data are a promising complement, since they add predictive information without adding work at the bedside[21].

Delirium should have a more explicit place in fall prevention. Nonpharmacological delirium-prevention programs have been linked to meaningful reductions in falls[37,38] — possibly on the same order as programs designed specifically to prevent falls — and yet guidelines and hospital programs seldom describe them in those terms. Because delirium and falls feed into each other[16], the benefit may be bidirectional: preventing delirium may lower fall risk, and preventing falls may reduce subsequent delirium. Wards caring for older adults should consider an active delirium-prevention protocol and include fall rates among the outcomes they monitor.

There is also a potentially counterproductive incentive within current systems. When a serious inpatient fall is treated as a never event, the reflex response is to restrict movement — reducing falls at the expense of immobility, with subsequent deconditioning and delirium that may produce greater overall harm[9]. A more defensible approach would weigh outcomes by net harm and actively support safe, progressive ambulation.

The handoff at discharge remains a blind spot in both research and routine care. Few patients are told that unsupervised home exercise increased falls among recently discharged older adults[43]. General advice to "stay active," without supervision or balance-specific content, can do net harm in the weeks after a hospital stay. Discharge instructions should prioritize supervised, balance-focused rehabilitation rather than a vague recommendation to increase activity.

Three points of genuine disagreement are worth a brief word. For head CT in anticoagulated patients, the ACEP position — that routine repeat imaging adds little once the initial scan and neurological examination are normal[31] — fits the low rate of clinically important delayed bleeds[29,30], even if European guidelines remain more cautious in specific high-risk subgroups. For vitamin D, 800–1,000 IU/day helps older adults with documented deficiency but does not justify giving it to everyone[11,44,45,46]. And for technology, the fact that a wearable can detect a fall says nothing about whether it prevents one, which the current evidence does not show[11,47].

This review contributes in three main ways. First, it treats delirium prevention as fall prevention — a link guidelines acknowledge but rarely translate into practice. Second, it keeps the focus on the ED and the peri-acute period, whereas most reviews speak to community or stable inpatient populations. Third, it places risk assessment, injury management, the search for a cause, and prevention within one sequential bedside framework (Table 4), supported by four further reference tables (Tables 1–3, 5), so that clinicians can consult the key domains in one place. Across all of these domains, the central obstacle is implementation in routine care. Qualitative and consensus work shows that no single professional group reliably takes primary responsibility for fall prevention, and that diffusion of responsibility leads to inconsistent delivery[7].

Evidence Gaps and Future Directions

Several gaps still limit the application of current evidence to day-to-day care. A recurring priority is the absence of a fall-risk tool that is both accurate and practical in the ED[7]; EHR-based models are an encouraging start[21] but still need external validation. The post-discharge weeks remain the least-studied high-risk window, and the finding that unsupervised home exercise can increase falls[43] supports the need for trials of supervised, balance-focused rehabilitation after discharge. Delirium is one of the strongest in-hospital risk factors[16], yet delirium-prevention protocols have not been tested rigorously as fall-prevention measures in their own right. How to balance early mobilization against fall prevention is still

unresolved, and never-event policies probably make that harder[9]. Persistent guideline disagreements — repeat CT in anticoagulated patients[28,31], vitamin D[11,44,45,46], and routine electrocardiography in fall evaluation[17] — need prospective study. Most importantly, the patients who carry the heaviest burden — those with advanced frailty, active delirium, or severe cognitive impairment — are often underrepresented or excluded from trials[11], limiting how confidently the evidence can be applied to them.

Limitations

This review has the inherent limitations of narrative methodology. The literature search was structured but not systematic, and article selection was purposive rather than exhaustive, introducing the possibility of selection bias. The included evidence is heterogeneous across populations, settings, fall definitions, and outcome measures, precluding quantitative synthesis. A substantial proportion of the evidence derives from community-dwelling or stable inpatient populations, limiting direct applicability to the ED. Publication bias may further affect the evidence base, particularly for null trials of fall prevention interventions. Despite these constraints, this review draws on high-quality guidelines, systematic reviews, and landmark RCTs to provide a clinically focused synthesis relevant to emergency medicine and geriatric practice.

Conclusions

In acute care, a fall in an older adult is rarely a simple accident; far more often it signals underlying vulnerability. A complete evaluation should include the injury, the precipitating cause, frailty, cognition, medications, and the patient's social situation — domains that extend well beyond a trauma-focused assessment. Scored risk tools have limited value when used alone, especially in the ED, and should not stand in for individual clinical judgment. Among prevention options, nonpharmacological delirium prevention, systematic medication review, and supervised, progressive mobilization have the firmest support, yet all three remain underused. The weeks after discharge are a particularly dangerous and neglected window. Progress will require ED-validated risk tools, workable models for supervised rehabilitation after discharge, and trials that include frail, delirious, and cognitively impaired patients, who carry much of the fall-related harm but are often excluded from trials.

Authors' contributions

Adniel García Cruz conceptualized the review, designed the manuscript structure, performed the literature search, drafted the initial manuscript, and coordinated manuscript revisions. Gretel Pimentel Barreiro contributed to the literature review, interpretation of clinical content, and critical revision of the manuscript for intellectual content. Eleida Adán Arévalo contributed to the literature review and critically revised the manuscript, particularly regarding radiological, imaging, and acute-care aspects. Jesús E. Rodríguez García contributed to the literature review, clinical interpretation, and critical revision of internal medicine and acute-care content. All authors reviewed and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

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