

Research Progress and Nursing Implications of Early Postoperative Mobilization in Older Adults with Hip Fracture

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Abstract

Early postoperative mobilization is a central component of recovery after hip fracture surgery in older adults. Earlier out-of-bed activity is associated with better mobility, fewer complications, and favorable discharge outcomes, although much of the evidence is observational. Studies use inconsistent definitions of “early,” mobility level, weight-bearing status, and activity dose. This review synthesizes evidence on the concept, clinical significance, determinants, assessment, and nursing interventions. For documentation, first mobilization should identify the first out-of-bed transfer, stand, or walk and measure elapsed time from the end of surgery. When medically and surgically feasible, assessment and an attempt should occur on the day after surgery; the 24 - 48 h research window does not justify deferring a feasible next-day attempt. Progression must follow the patient-specific weight-bearing order, and dizziness or symptomatic hypotension warrants pausing and reassessment. Nursing records should capture the activity level, dose, safety, engagement, and reason for delay.

Keywords

Older Adults, Hip Fracture, Early Mobilization, Ambulation, Rehabilitation Nursing, Review

1. Introduction

Hip fracture is a common fragility fracture in older adults and frequently occurs

in people with frailty, osteoporosis, cognitive impairment, and multimorbidity. Surgery restores mechanical stability, but perioperative pain, blood loss, anesthesia-related effects, and continued bed rest can further reduce muscle strength and orthostatic tolerance. Consequently, many patients do not regain their pre-fracture mobility even after fracture healing [1]-[3]. Early mobilization shortens exposure to bed rest, restores antigravity activity, and enables task-specific rehabilitation. The National Institute for Health and Care Excellence recommends rehabilitation assessment and mobilization on the day after surgery unless a medical or surgical contraindication is present [4].

Despite its inclusion in clinical pathways, early mobilization remains inconsistently defined and implemented. Studies use thresholds of 24, 36, or 48 h and different endpoints, including transfer, standing, or walking; weight-bearing status and activity dose are also incompletely reported [5]-[8]. The patient, treatment, and service factors associated with delay are examined together in Section 4. This review examines the concept, clinical significance, determinants, assessment, and interventions related to early postoperative mobilization, with emphasis on nursing implications.

2. Concept and Characteristics of Early Postoperative Mobilization

Early postoperative mobilization is a progressive transition from bed rest to sitting, bed-to-chair transfer, standing, and walking as soon as medical status, surgical stability, pain, and the prescribed weight-bearing level permit. For this review, first mobilization means the first assisted or independent out-of-bed attempt that achieves a chair transfer, standing, or walking; turning, ankle-pump exercises, passive range-of-motion activity, and sitting up in bed alone do not count. Record the end of surgery as the time origin, the time of this first qualifying activity, and the highest task achieved. Chinese protocols commonly arrange active bed exercise, sitting out of bed, standing, and walking as sequential targets [2] [3] [9]. Research often classifies activity within 24 - 48 h as early [5]-[8], whereas NICE recommends assessment and an attempt to mobilize on the day after surgery unless medically or surgically contraindicated [4]. A 48-h research threshold should not be treated as a reason to postpone an appropriate next-day attempt.

Three features distinguish this intervention in older adults with hip fracture. First, it is individualized because pre-fracture mobility, cognition, frailty, and comorbidity vary widely. Second, readiness may change rapidly and requires reassessment before each session. Third, implementation depends on a clear surgical weight-bearing prescription, medical optimization, nursing surveillance, rehabilitation expertise, and caregiver support [10]-[16]. Early mobilization is therefore a dynamic care process rather than a single walk or a binary event.

3. Clinical Significance

3.1. Recovery of Mobility and Activities of Daily Living

Bed rest accelerates lower-limb weakness and loss of postural tolerance. Progres-

sion through sitting, transferring, standing, and walking increases neuromuscular recruitment and loading and provides a basis for recovery of activities of daily living. A systematic review found that mobilization within 48 h was associated with better patient-reported mobility, activities of daily living, and health-related quality of life [5]. A meta-analysis of 26 studies involving 297,435 participants likewise reported an association between mobilization within 24 - 48 h and greater functional independence at discharge; its pooled evidence included observational studies, so this estimate should not be read as an isolated treatment effect [6]. Prospective cohorts and structured protocols report earlier first mobilization and better Barthel Index or hip-function outcomes [9] [17]. Because mobility endpoints differ across studies, benefit should be judged by the actual task achieved rather than by the label “mobilized” alone.

3.2. Reduction of Bed-Rest-Related Complications and Mortality

Early activity may support ventilation, circulation, and lower-limb muscle-pump function, but evidence that mobilization itself prevents pneumonia, venous thromboembolism, pressure injury, or delirium is less secure. Failure to mobilize early was associated with more in-hospital complications in an observational study [18], and a study combining early activity with intermittent pneumatic compression reported improved femoral venous flow [19]. Pooled studies also reported associations with fewer overall complications, pneumonia, and thromboembolic events [6]; mixed designs, confounding, and co-interventions limit causal attribution. Mobilization remains one component of a broader bundle that includes thromboprophylaxis, respiratory care, nutrition, and delirium prevention.

Large observational studies have linked delayed mobilization with higher mortality. Lack of mobilization on the day of surgery or the following day was associated with higher in-hospital mortality [20]; early ambulation was associated with lower 30-day mortality [21], and walking on postoperative day 1 marked better outcomes [22]. Registry data from 36,229 patients found an association between first mobilization later than 24 h and increased 30-day mortality [8]. These are prognostic associations, not proof that moving a patient earlier independently prevents death: patients who mobilize early may be more stable, functionally independent, and treated in better-resourced organizations.

3.3. Length of Stay and Discharge Outcomes

Mobilization is both a measure of recovery and a prerequisite for discharge planning. In a UK database study of 135,105 patients, mobilization within 36 h was associated with a greater probability of discharge within 30 days [7]. Other studies link first-day or same-day mobilization with better walking ability at discharge, shorter length of stay, and a greater likelihood of returning home [23] [24]. Multidisciplinary rehabilitation may further improve function and return to the pre-fracture residence, although the certainty of randomized evidence remains limited [25]. First mobilization should therefore be connected to continuous inpatient re-

habilitation and explicit discharge goals.

4. Factors Influencing Early Mobilization

4.1. Demographic and Pre-Fracture Factors

Advanced age, frailty, poor pre-fracture mobility, use of a walking aid, residence in long-term care, and multimorbidity are common predictors of delayed mobilization [10] [11] [14]. An observational cohort of 12,318 patients found that pre-operative aid dependence, cognitive impairment, institutional residence, and higher anesthetic risk were associated with failure to mobilize on the first postoperative day [14]. A scoping review additionally identified malnutrition, obesity, a low pre-fracture Barthel Index, and a low New Mobility Score [10]. Although these factors are not readily modifiable, they can guide early allocation of additional staff, monitoring, and equipment.

4.2. Acute Physiological Status and Symptom Burden

Acute barriers include pain, fatigue, anemia, postural hypotension, nausea, and delirium [10]-[13]. Orthostatic intolerance may cause dizziness, weakness, or near-falls on the first attempt. Nurses should assess treatable symptoms, optimize analgesia and hydration as clinically indicated, adapt the position change, and arrange assistance or equipment. These findings should be documented with the achieved activity and the reason for any interrupted attempt.

4.3. Cognitive and Psychological Factors

Cognitive impairment and delirium reduce comprehension, cooperation, and retention of safety instructions, but they should not automatically exclude a patient from mobilization. Cognition needs to be interpreted alongside pre-fracture function and current delirium status [10] [26]. Patients may also fear pain, falls, fixation failure, or reinjury and may perceive next-day mobilization as unsafe. Qualitative and mixed-methods evidence suggests that clear instructions, perceived safety, and caregiver attitudes influence engagement [15] [27]. Assessment should include understanding, confidence, willingness, and fear as well as physical capacity.

4.4. Surgical and Treatment Factors

Surgical delay, procedure, fixation stability, weight-bearing restrictions, and attached devices influence the start and level of activity [10] [13] [28]. After arthroplasty, verify the surgeon's loading order and any approach-specific hip movement precautions; after internal fixation, verify fixation stability and the prescribed loading limit. The procedure name alone should not be used to infer unrestricted walking. The patient-specific postoperative order governs progression: when weight bearing as tolerated is permitted, assisted standing and walking can follow transfer as tolerated; when partial or non-weight-bearing restrictions apply, transfers and any standing or stepping must stay within that limit, with suitable

aids and trained assistance. A restriction on walking does not automatically preclude supported sitting or an appropriately assisted transfer, but the surgical team must clarify movement and transfer precautions. Handover should specify permitted loading, movement restrictions, equipment, assistance, and review criteria so that ambiguous orders do not create avoidable delay.

4.5. Family and Health-System Factors

Caregivers can describe baseline function, reduce anxiety, and encourage participation, but fear of falls or fixation failure can reinforce avoidance [15] [27]. Therapist availability, weekend services, walking-aid access, nursing workload, and role clarity also affect opportunities to mobilize [10] [12] [16]. Documentation should distinguish a medical or surgical contraindication, patient refusal, unavailable assistance, missing orders, and absent equipment. Together with Sections 4.1-4.4, this classification provides a single account of reasons for delay to guide intervention.

5. Assessment of Early Mobilization

5.1. Timing

For measurement, define time to first mobilization from the end of surgery to the first documented out-of-bed transfer, stand, or walk, stating the specific task and whether assistance or equipment was used. Studies use thresholds of 24, 36, and 48 h [5]-[8], while NICE calls for assessment and mobilization on the next post-operative day when feasible [4]. The calendar-day recommendation and elapsed-hour research thresholds are different measures and should be reported separately. A hoist-assisted transfer and independent walking must not be collapsed into an unqualified “mobilized” outcome; record the times of first transfer, standing, and walking and the reason for delay.

5.2. Mobility Level and Functional Outcomes

Useful measures include the Cumulated Ambulation Score, New Mobility Score, Barthel Index, Functional Independence Measure, and walking distance [5] [10] [29] [30]. The Cumulated Ambulation Score captures bed-to-chair transfer, sit-to-stand, and indoor walking and is well suited to early postoperative mobility; the Barthel Index assesses broader activities of daily living. No single total score should replace bedside observation. For a patient with severe frailty or cognitive impairment, safe sitting or a chair transfer may constitute clinically meaningful progress even when walking is not yet possible.

5.3. Activity Dose and Safety

Frequency, duration, distance, loading, number of assistants, and equipment together constitute activity dose. Wearable sensors and gait-analysis systems can capture steps, duration, and gait characteristics that brief clinical notes may miss [29]. Before and during an attempt, assess consciousness, symptoms, pain, blood

pressure and heart rate as indicated, oxygenation, and wound and line safety. Pause activity and assist the patient into a safe sitting or lying position if new dizziness, presyncope, symptomatic hypotension, chest pain, marked breathlessness, new confusion, or concerning wound or line changes occur. Reassess symptoms and vital signs, address the likely cause, and seek medical or surgical review when indicated before a modified or later attempt; record the event and response. Device data and activity targets must remain subordinate to these bedside findings.

5.4. Engagement and Implementation Quality

The intervention depends on patient understanding, willingness, and continued participation as well as physiological capacity. Refusal, shared goal setting, confidence, fear, and caregiver involvement can characterize engagement [12] [15] [27]. For local quality improvement, proposed process indicators include whether the weight-bearing and mobility order is complete, whether next-day assessment and an attempt occurred or a contraindication was recorded, the activity level achieved, the reason for delay, and any adverse event [4] [16]. These are suggested audit measures based on guideline timing and implementation needs rather than a validated composite indicator set.

6. Interventions and Nursing Implications

6.1. Risk Stratification and a Standardized Pathway

A ward pathway should use the first-mobilization definition in Section 2 and specify readiness assessment, progression, stopping rules, and documentation. Baseline mobility, cognition, frailty, walking-aid use, and social support should be collected at admission, then integrated after surgery with symptoms, vital signs, and the surgeon's weight-bearing and movement orders. When permitted, patients can progress from sitting and transfer to standing and walking; restricted loading or movement requires a modified transfer and walking plan agreed with the surgical and therapy teams. Higher-risk patients may need closer monitoring, more assistants, or transfer devices rather than routine postponement. Standardized Chinese pathways show potential to shorten time to first mobilization and improve function [2] [3] [9].

6.2. Symptom Management before and during Activity

Symptom management should be guided by the acute barriers in Section 4.2. Analgesia can be timed to activity while avoiding excessive sedation, and patients with poor postural tolerance may begin with active bed exercise and edge-of-bed sitting before attempting a transfer or standing. If new dizziness, presyncope, symptomatic hypotension, or other concerning symptoms occur, pause and reassess as described in Section 5.3. Earlier mobilization and loading have been associated with better walking ability and pain outcomes in retrospective data [31], while reviews of perioperative interventions suggest that benefits of individual strategies remain uncertain [32]. The practical goal is symptom control sufficient

for safe participation.

6.3. Goal-Directed, Graded Mobilization

Daily targets should be specific and achievable, such as sitting at the bedside for five minutes, transferring to a chair with two assistants, or, if weight bearing permits, walking three metres with a frame. Feedback after each achievement builds confidence and permits stepwise progression. Sitting and transferring remain valid gains when walking is restricted or not yet tolerated. Standing and walking should follow the documented loading and movement limits; patients unable to maintain a partial or non-weight-bearing restriction may need a different aid or transfer method and therapy review. Equipment requires fitting, training, and fall-prevention measures. Nursing notes should state the target, assistance, result, symptoms, and next step.

6.4. Patient and Caregiver Empowerment

Patients and caregivers may interpret pain and weakness as signals to remain in bed. Brief, concrete education should explain the purpose, expected sequence, safeguards, and stopping conditions for mobilization. Communication should answer the patient's principal concern rather than simply state that walking is mandatory. One-step instructions, repetition, demonstration, and familiar caregiver participation may help patients with cognitive impairment. Caregivers are valuable sources of reassurance and continuity [15], but untrained family members should not be expected to perform professional transfers.

6.5. Multidisciplinary Coordination and Audit

Surgeons should communicate fixation stability and weight-bearing status; geriatric and anesthesia teams should optimize perioperative illness; nurses should integrate mobility with routine care and surveillance; and therapists should assess function and advance activity. Multidisciplinary rehabilitation and more frequent physiotherapy have been associated with favorable discharge outcomes, although evidence strength and study designs differ [25] [33]. A daily review can use the delay categories in Section 4.5 to target the relevant obstacle. Care pathways, audit and feedback, and clinical supervision may improve guideline adherence, but the certainty of evidence differs across strategies [16].

6.6. Digital Monitoring and Feedback

Wearables, bedside mobility records, and gait sensors can provide objective information on activity time, step count, and movement quality and can reveal low activity that routine charting misses [29]. Visible feedback may motivate patients who can interpret it. Technology cannot replace bedside assessment, and step targets should never override pain, fatigue, cognition, or safety. Future work should combine objective activity data with nursing documentation, patient-reported outcomes, and post-discharge function to identify an appropriate dose for differ-

ent risk groups.

7. Conclusion

Early postoperative mobilization is an important component of recovery after hip fracture surgery in older adults. Offer assessment and an attempt on the day after surgery when medically and surgically feasible; research often uses an elapsed 24 - 48 h window, which should not defer a feasible next-day attempt [4]-[8]. Progress from a documented out-of-bed task through transfer, standing, and walking according to the individual weight-bearing prescription and reassess when symptoms arise. Earlier mobilization is associated with better functional, complication, and mortality outcomes, but many estimates are observational and do not establish an independent causal effect. Nursing practice should assess timing, level, dose, safety, and engagement, document the reason for delay, and coordinate progression across disciplines. Future multicenter studies should use common definitions and include people with cognitive impairment, severe frailty, and poor pre-fracture mobility.

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Author Contributions

Conceptualization, J.W., C.R., and W.Z.; methodology, J.W. and C.R.; software, J.W.; validation, C.R., W.S., Y.Y., Y.Z., and W.Z.; formal analysis, J.W. and C.R.; investigation, J.W., C.R., W.S., Y.Y., and Y.Z.; resources, W.S., Y.Y., Y.Z., and W.Z.; data curation, J.W. and C.R.; writing—original draft preparation, J.W. and C.R.; writing—review and editing, J.W., C.R., W.S., Y.Y., Y.Z., and W.Z.; visualization, J.W.; supervision, W.Z.; project administration, W.Z.; funding acquisition, W.Z. All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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