




Postacute Management of Older Adults Suffering an Osteoporotic Hip Fracture: A Consensus Statement From the International Geriatric Fracture Society

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Abstract

Background: The majority of patients require postacute care (PAC) after a hip fracture. Despite its importance, there is no established consensus regarding the standards of care provided to hip fracture patients in PAC facilities. **Methodology:** A writing group was created by professionals from the International Geriatric Fracture Society (IGFS) with representation from other organizations. The focus of the statements included in this article is toward PAC providers located in nursing facilities. Contributions were integrated in a single document that underwent several reviews by each author and then underwent a final review by the lead and senior authors. After this process was completed, the document was appraised by reviewers from IGFS. **Results/Conclusion:** A total of 15 statements were crafted. These statements summarize the best available evidence and is intended to help PAC facilities managing older adults with hip fractures more efficiently, aiming toward overall better outcomes in the areas of function, quality of life, and with less complications that could interfere with their optimal recovery.

Keywords

systems of care, statement, hip fracture, postacute care, geriatric, older adults

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Introduction

Each year, more than 300 000 Americans sustain a hip fracture. Osteoporotic hip fractures are a major cause of morbidity and mortality among older adults.¹⁻³ In addition, osteoporotic hip fractures continue to be a source of disability, with as many as 60% of patients developing a new need for assistance with activities of daily living (ADLs).⁴

Fractures that occur as a result of low impact trauma, such as a fall from the standing position, are considered fragility fractures.⁵ Fragility fractures are the most devastating consequence of osteoporosis and represent a major source of expense for health care systems.⁶ For the United States, the cost of treating osteoporotic hip fractures is estimated at more than US\$5 billion annually. As more than two-thirds of hip fracture patients will not be able to return home immediately after being discharged from the hospital, most of the cost for hip fracture care is incurred in the postacute setting,⁷⁻¹⁰

As a result of the overall burden of osteoporotic hip fractures for health care systems and society in general, many initiatives have been created to improve outcomes and reduce cost.¹¹⁻¹³ Improvement strategies have been primarily based around the inpatient hospital admission. A primary method of process improvement has been the implementation of Geriatric

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Table 1. Importance of Standardizing Postacute Care for Hip Fracture Patients.

1. There is great variability in length of stay in this phase as well as the treatment given to the patients¹⁹
2. Coordination of follow-up care is essential for ongoing patient safety and function²⁰
3. Many critical issues such as nutrition, proactive discharge planning, and osteoporosis treatment are inadequately addressed,²¹
4. Medical complications, delirium, and depression occur commonly in the postacute setting²²

Orthopaedic comanagement. This initiative has 4 main goals: pain control, early surgical repair, avoidance of hospitalization-related complications, and early mobilization.¹⁴

Although Geriatric Orthopaedic programs are structured differently, they are based on the principle of collaboration between orthopedic surgeons and an interprofessional team of care providers with geriatric expertise.¹⁵ Several studies have demonstrated that the implementation of Geriatric Orthopaedic programs is associated with decreases in time to surgery, length of stay, cost, and complication rates.^{16,17} In the postacute care (PAC) setting, an interdisciplinary approach to patient care is also important but its format is different. For example, members of the care team, such as orthopedic surgeons who usually attend patients in the acute setting, usually do not have a physical presence in PAC facilities.¹⁸

The majority of patients require some form of PAC after a hip fracture.¹⁰ Postacute care may be delivered at home (including senior living centers and assisted living facilities) with physical therapists and nurses, in a skilled nursing facility or, in complicated cases, an inpatient rehabilitation hospital. The focus of the statements in this article is institutional-based PAC in nursing facilities (NF).⁸

The general aim of PAC interventions is to restore patients to their preinjury level of function. In the case of hip fracture patients, many other aspects of care are important, calling for some standardization of PAC for this population (Table 1).¹⁹⁻²² There is a subgroup of patients who suffer a hip fracture and do not undergo surgical repair. Part of this group represents those for whom surgery is not indicated due to the type of fracture, and the other part includes patients who due to their functional status at the time of the injury or severity of illness cannot undergo or might not benefit from surgical management.⁵ This approach to care is especially relevant for long-term residents of nursing homes with advanced dementia.^{23,24} Some of the recommendations in this document might not apply to this patient population.

Despite the importance of PAC, there is no established consensus regarding the standards of care provided to hip fracture patients in PAC facilities. A writing group was created by professionals from the Special Interest Group in Geriatric Surgical Co-management of the American Geriatrics Society (AGS), and the International Geriatric Fracture Society (IGFS). The writing group was formed with clinicians with expertise in caring for patients with hip fractures, including geriatricians, orthopedic surgeons, and physical therapists. Members of the

group performed literature review independently, which included publications derived from research involving human subjects, published in English, and developed a series of statements to help establish guidance for providers in PAC facilities regarding the standards of care of osteoporotic hip fracture patients. The authors were invited to participate based on their known expertise related to their publication record in the area or by their current leadership positions in related scientific organizations. The first draft of the outline was proposed by the lead author and then submitted for discussion to the group. Sections of the article were assigned based on each author's interest and areas of expertise. Literature review was completed independently by each author. The level of evidence was not graded. Contributions were integrated in a single document that underwent several reviews by each author and then underwent a final review by the lead and senior authors. After this process was completed, the document was appraised by reviewers from IGFS. We did not seek endorsement from other scientific organizations. Due to limited number of publications in the area, the statements listed in this document are a combination of evidence-based statements and expert opinions.

Identifying Patient's Needs and Choosing the Right Hospital Discharge Disposition

Selection of PAC facilities should be based on the rehabilitation needs and medical complexity of each patient at the time of discharge, preferably within a known network of PAC providers, and respecting patients' preferences including geographic location.

Transition to PAC facilities places patients at a higher risk of unintended harm.²⁵ Successful PAC starts by selecting the right facility. Selection of PAC facilities should match patient's needs, including the need for rehabilitation services, expertise to manage medical complexity, access to social support, and personal preferences.²⁶ Comparative assessments of different PAC settings is limited,²⁷ but the evidence suggests that the PAC plans should involve intensive rehabilitation.^{28,29} An interprofessional prehospital discharge assessment should include portions of the comprehensive geriatric assessment (CGA) including preinjury and postoperative functional status.^{30,31} Such assessments also should include a complete review and reconciliation of medications and medical conditions at the time of discharge (Figure 1). Traditionally, facility selection is based on proximity to patient's home and previous experience of patients or their families. This approach is frequently used by hospitals as it results in higher patient and family satisfaction with their placement.³² Hospitals may also provide information about facilities that are part of a preferred provider network. Although not specific to hip fracture patients, such an approach has shown to improve outcomes including hospital readmissions.²⁶

Case managers should use standardized tools to assess post-acute facility capabilities. Interventions to Reduce Acute Care Transfers (INTERACT) is a quality improvement program that

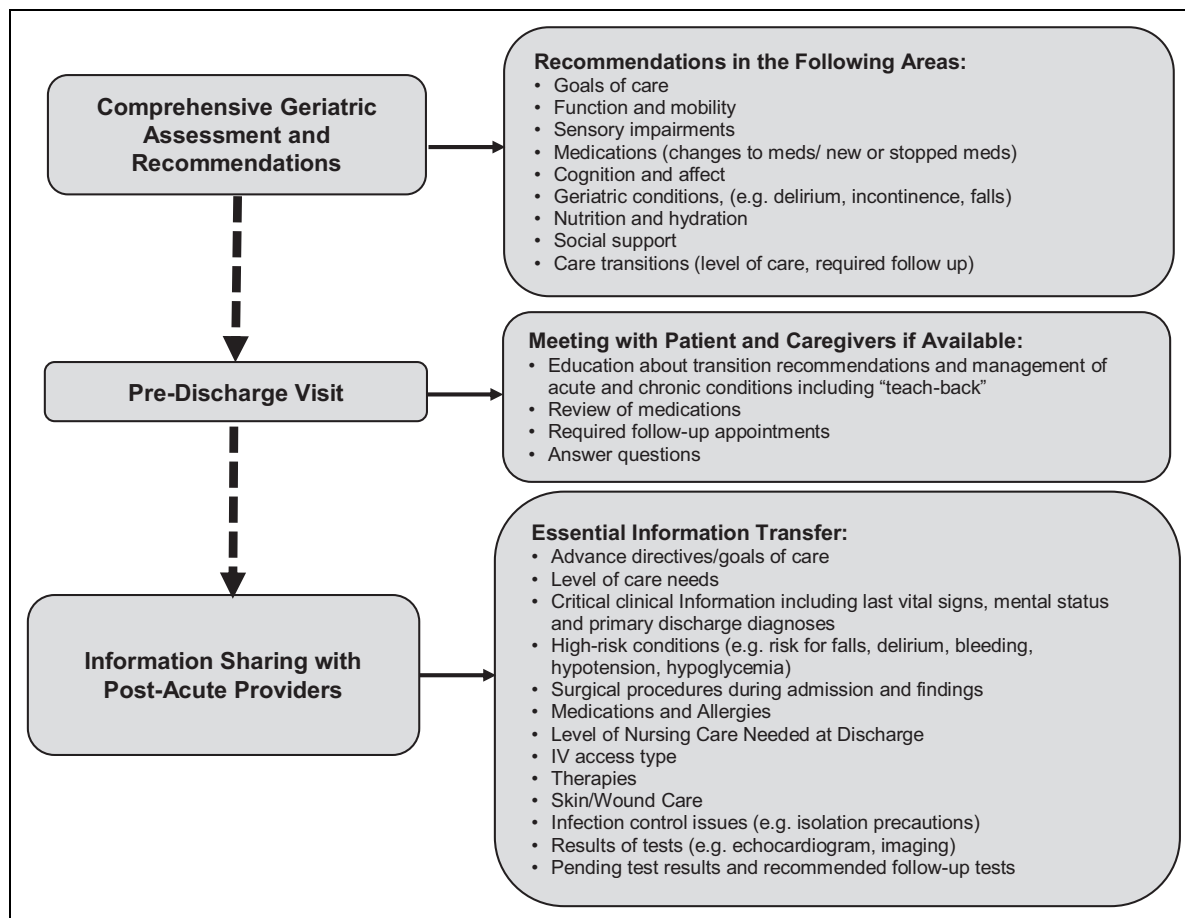


Figure 1. Elements of Hospital Pre-Discharge Evaluation.

focuses on the management of acute changes condition in PAC and long-term care settings. The program’s resources are available free of charge in the Internet. One of the INTERACT tools is the SNF/NF Facility Capabilities List. This tool includes a standardized prepopulated checklist of PAC facility capabilities for decisions about transfers to the facility (<https://pathway-interact.com>).

Caring for Hip Fracture Patients in the PAC Facility

The initial evaluation of patients in a PAC facility should include a CGA that is performed by an interprofessional team. Clinicians should pay special attention to hospital acquired or decompensated chronic medical conditions.

Approximately 20% to 40% of patients will suffer medical complications during hospitalization for a hip fracture. Most of the complications are cardiopulmonary in nature.³³⁻³⁵ In addition, as patients suffering hip fractures often meet criteria for frailty, they are at higher risk of developing geriatric syndromes and exacerbations of chronic conditions while in the hospital or in the PAC setting. Invariably, older adults who

suffer a hip fracture will require physical therapy (PT). Restoring mobility after hip fracture has been an essential component of high-quality care since the 1980’s.^{36,37} For most hip fracture patients, the aim of transferring to a PAC facility is to recover preinjury levels of function and return to their prior living arrangement. Treatment plans should not be limited to PT but also a comprehensive review of medical conditions that can affect rehabilitation potential, such as heart failure, chronic lung disease, diabetic neuropathy, and other neurological and musculoskeletal disorders should be performed. Direct communication with the patient’s primary care and specialist physicians can be essential in evaluating these conditions. Treatment plans should consider social determinants of health aiming for a safe and feasible discharge to a lower level of care. This includes social support, the capabilities of family caregivers, the home environment, financial and insurance considerations, and the availability of transportation. Such an approach will result in an overall assessment of the patient’s functional status and potential for recovery and return to a lower level of care or home.

Comprehensive geriatric assessment is a standardized method of evaluating geriatric patients. The CGA is an interdisciplinary evaluation of medical comorbidity and other factors that could influence outcomes such as social support, polypharmacy,

Table 2. Goals of Initial Postacute Assessment.

1. Determining preinjury functional status in order to understand the optimal patient-centered goal for postacute care
2. Assessing loss of function
3. Identifying comorbid conditions and optimize treatment for chronic medical conditions
4. Addressing hospital acquired conditions including geriatric syndromes
5. Understanding patient's goals and priorities, including the need for palliative care/hospice if applicable
6. Proactively addressing predischarge planning

nutritional issues, and potential challenges at the time of discharge. The CGA provides a clinical baseline that allows the clinicians to make timely and informed clinical decisions.^{38,39}

The CGA takes time and results can be altered by acute changes in condition and complications that occur in the initial period after admission to the PAC facility. Nonetheless, it continues to be a valuable tool to determine the needs of patients arriving to a PAC facility and, most likely will help identifying potential needs at the time of discharge to home, if this is the ultimate goal.⁴⁰ The most important goals of the initial PAC evaluation can be found in Table 2.

Designing Optimal Physical and Occupational Therapy

Physical therapy should start as early as possible after admission to a PAC facility. Older adults after surgical repair of a hip fracture should be performing high intensity lower extremity strength training, along with activities that challenge balance and encourage mobility such as rising from a chair, walking, and climbing steps. Patients should receive education regarding pain related to the process of rehabilitation.

National and international guidelines recommend that PT is initiated on the first day after surgery and continues across the continuum of care.⁴¹ The most successful PT plans include early intervention with intense PT.⁴²⁻⁴⁴ Rehabilitation (PT and occupational therapy [OT]) plans should expedite recovery and take into consideration active comorbid conditions and other socioeconomic determinants of health, and address the abilities needed to function at home.^{43,45} For most patients who have caregiver support at home, reasonable goals include standing from a chair and out of bed with minimal assistance or contact guard and walking the length of the home using an assistive device with close supervision. Those who do not have caregiver assistance at home need to be independent in all these key functions, in addition to bathing, toileting, and dressing before discharge.⁴⁶ With intensive daily OT and PT, these goals should be achievable in 2 to 4 weeks for most uncomplicated patients. Therapy should be focused on transferring the patient to the preinjury living environment as soon and as safely possible to minimize the risk of learned helplessness.

The key elements of any rehabilitation plan should include strengthening, functional mobility, home modifications, and

Table 3. Key Elements of Physical Therapy Regimens for Hip Fracture Patients.

1. Progressive resistance exercises (PREs), targeted at lower extremity muscles hip extensors, hip abductors, knee flexors, and extensors and plantar flexors
2. Multijoint activities
3. Strengthening with body weight as the load, with gym equipment, or steps
4. Balance training, stepping exercises in various directions and to different heights, foot tapping while standing, and functional tasks while standing
5. Functional mobility training with the addition of gait training and chair rise activities

fall risk assessment (Table 3). Rehabilitation should be daily (minimum 5 days per week). Session length will be dependent on the content of each session. For example, strength training in PT should occur 3 days per week with a day of rest in between sessions. Functional training in PT and OT, including for gait, transfers, balance, and ADLs should be performed daily. For most patients, sessions should be between 30 to 60 minutes depending on patient tolerance.⁴⁷

Physical therapists need to monitor both physical and physiological responses to structured exercise programs. Since hip fracture patients often have other chronic conditions such as spinal or lower extremity arthritis, strengthening exercise needs to be performed in a biomechanically safe manner. Instruction, observation of technique, and limiting the range of motion during performance to pain free ranges are indicated. Education about delayed onset muscle soreness is warranted before starting high intensity programs. Education includes differentiating muscle pain and arthritic joint pain from postsurgical hip fracture pain. Resting measures of heart rate and blood pressure should precede all exercise sessions and should occur during or after the session if any signs of over exertion are present. Patients with active cardiovascular disease, including those with history of atrial fibrillation with rapid ventricular response and those on treatment with hypotensive agents, should have vital signs monitored during PT sessions, including postural vital signs as indicated.⁴⁸

Preliminary evidence suggests that patients with cognitive impairment benefit from similar rehabilitation interventions as those without cognitive impairment.⁴⁹ The systematic reviews addressing this question found that studies were so heterogeneous, the outcomes could not be combined in any meaningful way. From a clinical perspective, similar gains can be made in patients with cognitive impairments if patients are approached with simple instructions while adjusting the environment to the patient's needs.⁵⁰ For the patients with cognitive impairment, the rehabilitation plan should focus on functional tasks such as ADLs which are more likely to be familiar to each individual patient. Training of caregivers should also be included since OT training resulted in reduced emotional distress for the caregivers. Innovative approaches are needed to engage individuals with

cognitive impairment; however, there is no clear consensus on the frequency, intensity, or duration of these interventions.⁵¹

Cognitive and Mood Disorders

Patients should be screened for depression and cognitive impairment by a clinician at the time of admission to PAC facilities. If indicated, treatment for depression should be started immediately and should include recreational activities. If pharmacological treatment is necessary, it should be started at the minimum effective dose.

The sequela after a hip fracture including but not limited to pain, immobilization, hospitalization, surgery, and uncertain prospects of recovery can result in development of depression. Individuals with clinical evidence of apathy are at high risk for developing mood disorders. Screening for depression and cognitive impairment is important given that these are common in hip fracture patients and are associated with greater risk of poor outcomes, both independently and in combination.^{52,53} Depression can be screened by a clinician through the Patient Health Questionnaire (PHQ)-2 at the time of admission. If a patient screen positive, then the PHQ-9 or the Geriatric Depression Scale can be completed. Depending on the results, treatment should start immediately. For example, patients who score 14 or more on the PHQ-9 are most likely to benefit from pharmacologic, psychotherapy, or a combination of both. In addition, recreational activities are effective and must be part of the treatment plan unless contraindicated. If pharmacological treatment is necessary, in order to reduce the possibility of side effects including an increased risk of falling,⁵⁴ the medication of choice should be started at the minimum effective dose with slow titration, and taking into consideration potential drug–drug interactions.⁵⁵

Cognitive impairment is often not recognized in the PAC setting. Initial screening for cognitive impairment can be completed using the Mini-Cog.⁵⁶ If patients screen positive, then other tools can be used such as the Saint Louis University Mental Status Examination, the Mini-Mental State Examination, or the Montreal Cognitive Assessment to confirm the diagnosis of cognitive impairment even in mild cases.⁵⁷⁻⁵⁹ Recognition and treatment of cognitive impairment may reduce adverse outcomes in this vulnerable population, including delirium.⁶⁰

Delirium Prevention and Treatment

For patients at risk of developing delirium, preventive measures should be in place from the time of admission. The PAC facilities should embed delirium prevention/detection strategies within their daily assessments.

Delirium is present in a substantial portion of patients arriving to PAC facilities⁶¹ and can interfere with rehabilitation activities in patients with hip fracture. Routine screening for delirium using the Confusion Assessment Method is embedded in the Minimum Data Set. In the general population of frail

Table 4. Common Components of Successful Delirium Prevention Programs.

1. Pain control
2. Assessment of bowel/bladder function
3. Early mobilization
4. Reorientation
5. Medication review
6. Address malnourishment
7. Avoid dehydration
8. Managing sleep disorders
9. Treat vision and hearing impairment
10. Geriatric medicine consultation
11. Training of PAC facility staff

Abbreviation: PAC, postacute care.

older adults, fewer patients who develop delirium are able to return home and have poorer functional status at 1 and 3 months after discharge.^{62,63} Prevention and appropriate treatment of delirium are important in both the acute and PAC settings.⁶⁴ Early recognition of delirium that develops in the PAC setting is critical in order to prevent complications, including hospital readmissions. The Hospital Elder Life Program (HELP) has shown to reduce incidence and duration of delirium.⁶⁵ A modified version of the HELP program for long-term care has been tested in limited PAC settings with success.⁶⁶ The INTERACT program includes tools for the early recognition, assessment, and management of acute changes in mental status that may be helpful in achieving this goal.

Despite the lack of rigorous evidence, PAC facilities should implement delirium reduction programs that can be embedded in the daily workflow of caregivers, especially for patients at higher risk such as those with cognitive impairment. Most of the programs to prevent delirium consist of interventions bundles. There is no evidence supporting one program over another but most of them have common features (Table 4).⁶⁷ Commonly unrecognized causes of delirium include withdrawal from alcohol and medications. Alcohol dependence is more commonly present in young-older adults,⁶⁸ and the CGA at the time of admission should identify these patients.

Medication Management and Polypharmacy

All patients admitted to a PAC facility should undergo a comprehensive medication review and reconciliation that addresses polypharmacy, new medications with stopping dates if applicable, and changes in doses of existing medications due to medical complications occurring the hospital stay.

Hip fracture patients are more likely to have a high number of medications. In fact, the risk of hip fracture increases with the number of medications used.⁶⁹ Polypharmacy also has been associated with worse outcomes in postsurgical hip fracture patients.⁷⁰ Although medication review by a clinician has not been proven to reduce the rate of falls,⁷¹ there is an association between medication review and reconciliation and reduction of future fractures.⁷²

Medication review and reconciliation should have specific aims and must pay special attention to preinjury medications that were stopped and/or dose adjusted during the perioperative time due to complications such as hypotension, sedation, or hypoglycemia. Additionally, new medications need to have a clear indication and a schedule of gradual dose reduction or stop date when applicable.

Another important aspect of medication review is to verify that there are no potential contraindications or interactions, and that all drugs are used at the minimum effective dose. Lastly, all medications that increase the risk of osteoporosis should be stopped when possible.⁷³

Nutrition

All hip fracture patients should be assessed for malnutrition on arrival to a PAC facility. If they have poor oral intake or malnutrition is identified, high calorie, high protein supplements should be started after assessing for reversible causes.

In addition to the potential for baseline malnutrition, being in the hospital and subsequently in the PAC facility place older adults at additional risk of nutritional decline, especially if they are suffering from delirium, uncontrolled pain, constipation, lack of access to their choice of food, or their dentures. Malnourishment is related to poor outcomes including poor wound healing, infections, hospital readmissions, development of pressure injuries, and poor functional recovery.⁷⁴⁻⁷⁶ Some evidence supports the use of nutritional supplements in patients with underlying deficiencies to improve outcomes and reduce mortality.⁷⁷

Assessment of malnutrition can be easily done by taking a detailed history regarding dietary habits and unintentional weight loss in the last 6 to 12 months. Oral health should be assessed as ill-fitting dentures, and oral ulcers can lead to poor oral intake due to inability to properly chew food. Dry mouth is common, often caused by medications, and can interfere with oral health and nutritional intake. If medications that can cause dry mouth cannot be stopped, oral lubricants should be considered. Laboratory data for serum albumin level <3.5 g/dL or total lymphocyte counts less than 1500 cells/ μ L are helpful if present but not essential as part of the assessment.⁷⁴

The PAC facilities should have a protocol in place to offer oral supplements in addition to meals, liberalize diet, and allow families to bring in outside food to increase the oral caloric intake. There is no clear evidence demonstrating that intense nutritional interventions change meaningful outcomes such as mortality or functional recovery.⁷⁸ Nonetheless, these interventions are associated with other benefits including increase in body mass index (BMI) and shorter lengths of stay in PAC facilities.^{79,80}

Pain Control

A multimodal pain regimen should be started in every patient at the time of arrival to a PAC facility. Pain regimen treatments should include nonpharmacologic and pharmacological modalities.

Perioperative pain control is an important component on the management of geriatric patients following a hip fracture. The American College of Surgeons endorsed the Enhanced Recovery After Surgery program which recommends the use of multimodal pain control in the perioperative period for geriatric patients. Similarly, the American Academy of Orthopaedic Surgeons (AAOS) and IGFS recommend the same approach in their respective recommendations for the management of hip fractures in older adults.^{5,77} This approach to treat pain has not only shown efficacy in pain management but also reduction in opioid use and opioid-related side effects.

The American Medical Directors Association (AMDA) Clinical Practice Guideline (CPG) for Pain Management in Long-Term Care Setting offers a systematic approach to pain management. At the time of this publication, the above-mentioned CPG was being revised. One of the major challenges to achieve adequate pain control is lack of recognition by care providers. The presence of pain can present atypically in the older adults, especially those with dementia. Patients could present with restlessness, sleep disturbances, changes in mood, and changes in level of function. It is important to establish expectations regarding pain control with patients and families to avoid frustration and fear of participating in PT. Pharmacology treatment of acute pain always should start with the lowest effective dose of a medication and titrate rapidly.⁸¹

A multimodal approach to pain control that starts in the hospital setting has led to improved outcomes without increase in complications or readmissions.⁸² The net benefit of these improved outcomes can be extrapolated from cardiac surgery patients in improving rehabilitation potential in older adults with hip fracture.⁸³ Nonpharmacological approaches include application of heat and cold modalities, as well as other techniques such as relaxation, cushioning, and repositioning.⁸⁴ Pharmacological approaches to pain control should include scheduled nonopioid medications, such as topical creams, patches, and scheduled acetaminophen, in addition to as needed opioids if not contraindicated.^{85,86} The Centers for Disease Control and Prevention (CDC) released in 2016 guidelines for *Prescribing Opioids for Chronic Pain in the United States*. The guidelines are intended for primary care providers who need to treat chronic pain. The recommendations include special populations such as older adults which they identify as high risk for harm including falls and fractures.⁸⁷ Contrariwise, the document also recognizes the risk associated with the use of nonopioid pharmacologic treatment in older adults. Overall, CDC recommends the use of opioids with caution and for the shortest time possible.⁸⁸

Surgical Wound Care

An occlusive dressing that is dry should remain in place until staple or suture removal. Any concern for infection should prompt urgent communication with the surgeon.

Postoperative wound care is essential to decrease risks of deep wound infection. If an occlusive dressing was changed by

a surgeon before hospital discharge, it could be left in place for 1 week. These dressings are thought to be an antimicrobial barrier and have been found to reduce the need of dressing changes and reduce the risk of tape blisters.⁸⁸ A common mistake is to immediately change an occlusive dressing upon arrival to a PAC facility. Often, this is done with no available occlusive dressing replacement. Occlusive dressings are costly, and changing them routinely on patient arrival is an unnecessary expense. Wound closure may be with staples or sutures that require removal or with dissolvable suture and skin glue.

Signs of infection include increased pain and increased drainage. A certain amount of warmth, bruising, or redness may be normal in the immediate postoperative phase. Drainage from a wound typically is minimal or absent in the first few days after surgery.⁸⁹ Wounds that have undergone multiple surgeries and those in the morbidly obese patient may drain for a longer period. Drainage that continues at 2 weeks after surgery could be associated with either hematoma or infection. Wound check by a surgeon is recommended 2 weeks after surgery.⁹⁰ This may require a visit to the surgeon's office or where available, telemedicine may be an option.

If there is concern for infection, the surgeon should be notified, and the patient evaluated. Early treatment of infection is important. Superficial wound infections or suture abscesses typically happen several weeks after surgery and can be treated with local wound care. Deep wound infection or deep drainage hematoma require a return trip to the operating room for wash-out and debridement as well as antibiotics.⁹¹ Antibiotics alone are not a treatment for deep wound infection. The use of telemedicine appears to be an emerging option for patients in PAC facilities to have access to orthopedic surgeons' care.⁹²

Secondary Prevention of Falls

Hip fracture patients should undergo an evaluation for falls prevention that includes addressing polypharmacy, treatment of chronic pain, home safety evaluation, need of durable equipment, and balance exercises.

The incidence of falls in the year after hip fracture is slightly greater than 50%.⁹³ For women, the 1-year risk of subsequent hip fracture after initial hip fracture ranges from 4.7% to 7.9% with greater probabilities associated with increasing age and number of comorbidities.⁹⁴ Fall-risk assessment is the responsibility of the interprofessional team. Considering that all patients with a fragility hip fracture had a prior fall and are likely to have gait and balance impairments, initiating a comprehensive, multidisciplinary fall-risk assessment is recommended. The AMDA's CPG for the prevention of falls among patients at risk offers a systematic approach to the evaluation and treatment of those at risk of falling.⁹⁵ A key element of this process is understanding the settings of the fall that leads to the fracture as well as other previous falls (Table 5). It is also important to assess for risk of further complications related to falls such as the use of anticoagulants. Once risk factors

Table 5. Common Features of Fall Risk Assessment.

- | | |
|-----|--|
| 1. | Medical history including acute and chronic medical problems |
| 2. | Addressing polypharmacy |
| 3. | Treating chronic pain |
| 4. | Addressing fear of falling |
| 5. | Feet and footwear check |
| 6. | Visual acuity check |
| 7. | Home safety evaluation |
| 8. | Durable equipment needs |
| 9. | Screen for postural hypotension |
| 10. | Assess gait and balance and evaluate for neuropathic changes |

for falls have been identified, the treatment team needs to establish goals of treatment.^{96,97}

Other evidenced-based assessments of fall risk and intervention strategies are published by AGS in conjunction with the British Geriatrics Society.⁹⁸ Also, CDC website has the Stopping Elderly Accidents, Deaths & Injuries tool kit that includes medical screening and physical performance tests that captures aspects of lower extremity strength, gait, and balance which are highly relevant for older adults post hip fracture. The CDC site also includes information regarding community-based programs which would be relevant for older adults upon discharge from their individualized rehabilitation program (<https://www.cdc.gov/steady/materials.html>).

Fear of falling (FOF) is prevalent after hip fracture as 60.5% of patients reported FOF 4 weeks postfracture, and 47% report FOF 12 weeks postfracture. Fear of falling is associated with lower odds of functional recovery.⁹⁹ Cognitive and behavioral interventions as well as exercise have demonstrated to reduce FOF, nonetheless, the effect of such interventions might not be long-lasting.^{100,101}

Incontinence and Constipation

Hip fracture patients should be screened for urinary incontinence at arrival to a postacute facility and reversible causes should be treated accordingly. All patients should receive medications to prevent constipation unless contraindicated.

Incontinence is a common, bothersome, and potentially disabling condition in the geriatric population. Although hospital-acquired urinary incontinence can often be prevented, urinary incontinence evaluation and management might not be a priority for orthopedic care.¹⁰² Hip fracture patients may be exposed to urinary catheters during their hospital stay due to urinary incontinence and/retention and the need for protecting the surgical site. This type of incontinence/retention should be managed by environmental manipulation, scheduled toileting, appropriate use of toilet substitutes such as bed side commodes or bedpans, and careful attention to skin care.¹⁰³ Recording voiding frequency and volume and incontinence patterns will help identifying possible reversible contributors to the incontinence.

Urinary retention with "overflow" incontinence should be considered in any patient who suddenly develops urinary

incontinence after hip fracture surgery. Immobility, anticholinergic and opiate medications, as well as fecal impaction can precipitate urinary retention and overflow incontinence in geriatric patients. Many hip fracture patients come to the PAC facility with an indwelling catheter. The reason the catheter was placed in the acute hospital should be ascertained. If the patient had the catheter placed for acute urinary retention during the hospitalization, a period of 7 to 10 days of catheterization is appropriate to allow the bladder muscle to recover. All PAC facilities should have a specific “bladder retraining” protocol in place to remove indwelling catheters, and a bladder ultrasound to monitor postvoid residual volumes to avoid repeated catheterizations and the associated risk of discomfort and infection.¹⁰⁴

Constipation that can result in fecal impaction is a common problem in both acutely and chronically ill geriatric patients. Large impactions may cause mechanical obstruction of the bladder outlet in women and may stimulate involuntary bladder contractions induced by sensory input related to rectal distention. Fecal impaction can also result in fecal incontinence.

Bowel regimens are standard of care for PAC patients and are especially important for those receiving opioids.¹⁰⁵ In addition to adequate fluid intake and dietary fiber, pharmacologic management should depend on the nature of the constipation. Docusate is commonly prescribed, but there is no evidence that it is effective.¹⁰⁶ Bulking agents with adequate fluid intake, osmotic agents, and direct colonic muscle stimulants such as Senna and bisacodyl for narcotic-induced constipation should be considered. If the patient has a fecal impaction on rectal examination, suppositories or enemas are appropriate. Many patients are prescribed multiple laxatives which is generally not necessary and can contribute to abdominal cramping, diarrhea, and fecal incontinence. The AMDA'S CPG for the Management of Gastrointestinal Disorders also offer resources to treat constipation in long-term care settings.¹⁰⁷

Pressure Injury Prevention

Patients with risk factors for developing pressure injuries should be placed in prevention protocols including early mobilization, repositioning with pressure relieve, glycemic control, and nutritional evaluation.

Pressure injuries are common in the hospitalized population.^{108,109} The risk is higher in hip fracture patients as they are usually immobile and on bed rest until surgery.¹¹⁰ Common intrinsic risk factors include older age, extremes of BMI, poor glycemic control, cardiovascular disease, and malnutrition. Extrinsic risk factors include the friction and shear forces, pressure, and moisture.¹¹¹ Other risk factors include drugs that might affect healing such as steroids, incontinence (fecal and urinary), cognitive impairment, and history of a previous pressure ulcer.

Early mobilization is one of the most important strategies to prevent pressure injuries in postoperative hip fracture patients. Proper positioning especially around bony prominences (heels

and sacrum) should be started on all patients with limited mobility while in bed. It has been demonstrated that skin erythema and ischemic changes can occur in healthy adults in less than 2 hours on a standard mattress and hence the need of scheduled repositioning.¹¹² Although scientific evidence is limited, patients who are at higher risk of developing pressure injuries may benefit from using a pressure-reducing support surface and electrical stimulation.^{113,114} The AMDA's CPG for the Prevention of Pressure Ulcers were updated last in 2008. At that time, most of the interventions to prevent pressure differ little from what is stated above.

Attention should be given to the overall nutritional status of the patients, with a protein intake of approximately 1.2 to 1.5 g/kg body weight daily, as adequate nutrition may help prevent formation of pressure injuries and promote healing of early stage lesions. The use of vitamin C and zinc continues to be a common practice but the evidence for their efficacy is limited.^{115,116}

Deep Vein Thrombosis Prophylaxis

The risk of venous thromboembolism (VTE) should be assessed on arrival to a PAC facility. Nonpharmacologic and pharmacologic prophylactic measures should be considered depending on the risk of thrombotic events and bleeding. Preferred pharmacologic agents include direct oral anticoagulants (DOACs), aspirin, and low-molecular-weight heparins.

The AAOS has developed CPGs for preventing VTE in total hip and knee arthroplasty,¹¹⁷ but not specifically for hip fractures. The same AAOS guidelines recommend mechanical and pharmacologic prophylaxis in a consensus manner. Other groups have stated that aspirin may be less effective or as effective as low-molecular-weight heparin for postoperative deep vein thrombosis (DVT) and pulmonary embolism prevention among hip fracture patients and may be associated with lower rates of postoperative bleeding.¹¹⁸ Low-dose aspirin (81 mg twice a day) has been demonstrated to be as effective as higher doses of this medication for a period between 10 and 35 days after arthroplasty.¹¹⁹ Overall, there is not enough clarity regarding the best pharmacologic prophylactic agent for VTE, nonetheless, current evidence points toward the use of aspirin due to its apparent equal effectiveness and lower risk of bleeding.

The use of DOACs, has been studied as well. Most of the evidence available is related to elective hip arthroplasty. Apixaban appears to be superior to enoxaparin in the prevention of VTE without an increased risk of bleeding based on 3 industry sponsored clinical trials.¹²⁰ A systematic review of 16 trials including rivaroxaban, dabigatran, and apixaban compared with enoxaparin showed an overall decreased incidence of VTE in elective arthroplasty mostly for rivaroxaban, with a clinically relevant higher risk of bleeding for rivaroxaban and similar bleeding risk for dabigatran.¹²¹

The use of rivaroxaban for 5 days after arthroplasty followed by extended prophylaxis with aspirin 81 mg for 30 days

has shown similar efficacy than extended use of rivaroxaban without significant increase in the risk of bleeding.¹²²

The European Guidelines on Perioperative Venous Thromboprophylaxis recommends a multifaceted approach to DVT prophylaxis in older adults that takes into consideration risk factors such as heart failure, cancer, and obesity, among others.¹²³

Secondary Prevention of Osteoporosis

Hip fracture patients should be evaluated for future fracture risk using the FRAX score. Basic interventions should include vitamin D repletion, optimization of nutritional status, and lifestyle modification. Patients should be referred to a fracture liaison (if available) or providers with expertise in osteoporosis such as rheumatologists or endocrinologists before being discharged from a PAC facility.

Patients who suffer fragility fractures are at higher risk of developing subsequent fractures. Despite this increased risk, only a fraction of these patients receive treatment for osteoporosis.¹²⁴⁻¹²⁶ As bone mineral density only can account for less than 50% of bone strength,¹²⁷ secondary prevention should be considered even in patients with bone densities outside of the range considered for osteoporosis. The FRAX score is a validated tool that helps assess fracture risk in men and women and takes into consideration characteristics such as age, body habitus, family history, and use of medications, among others.¹²⁸

During the PAC facility stay, nutritional status should be assessed, and vitamin D levels should be measured, if not checked in the hospital, and supplemental vitamin D prescribed if indicated.¹²⁹ Although the quality of the evidence regarding their effectiveness is variable, lifestyle modifications such as exercise and diet should be part of the treatment plan.¹³⁰⁻¹³²

Conditions that can contribute to osteoporosis should be considered, including thyroid, parathyroid, kidney, neurological, obesity, hypogonadism, malignancies, and malabsorption disorders based on the patient's history, symptoms, and physical signs.

Starting pharmacologic treatment may be appropriate,¹³³ even in those with shorter life expectancy.¹³⁴ Due to the relative complexity of the workup and the controversial concerns from orthopedic professional societies regarding the right time to start treatment and its effects on fracture healing,⁷⁷ the use of antiabsorbing agents (ie, bisphosphonates) may be delayed until discharged from the PAC facility. Appropriate coordination of care through fracture liaison services has demonstrated to be a cost-effective strategy to reduce refracture risk and mortality.¹³⁵ If such a service is not available, good communication with the primary care provider or a specialist with expertise in the treatment of osteoporosis such as an endocrinologist or a rheumatologist is important. If there is a significant concern about appropriate follow-up or compliance, starting treatment during the PAC stay is a reasonable and safe option.^{136,137}

Discharge Planning

Discharge planning should be an interprofessional process that involves patients and members of their social support network. The plan of care should take into consideration functional status, chronic and newly acquired medical conditions, patient's priorities and values, as well as social support and preinjury living settings. Clinical follow-up appointments and home-based services should be established before discharge.

Discharge planning is an essential component of the care of hip fracture patients and *should start early in the rehabilitation process.* Most hip fracture patients have a relatively short length of stay in a PAC facility.¹³⁸ Regardless of the potential for recovery, there is substantial decline of functional status after a hip fracture. Such decline could be permanent or partially resolved therefore, PAC discharge planning should take into consideration the patient's living environment and social support at the time of discharge.^{139,140}

During PAC, it is important to identify the patient's social support system. These individuals should be involved in the care of the patient and participate in interdisciplinary meetings with providers, therapists, and the patient. Without a social support system, it could be challenging to discharge hip fracture patients home.^{141,142} Interventions that offer a home exercise program in addition to care counseling to address unmet care needs have been tested and found to be feasible.¹⁴³

Home safety assessments prior to discharge from a PAC facility can be accomplished by a home-care agency. A comprehensive evaluation by an occupational therapist will help in informing about modifications needed in the patient's home before discharge, thus maximizing their level of autonomy. Most falls occur at home, and safety improvements such as removing clutter, providing enough lighting, and installing grab bars in bathrooms might be needed prior to discharge.¹⁴⁴

It is important to schedule follow-up appointments after discharge with the patient's primary care provider and with the orthopedic surgeon.¹⁴⁵ Home health services should be involved, not only to continue improving mobility¹⁴⁶ but also to assess the status of chronic or newly acquired medical conditions such as heart failure, chronic obstructive pulmonary disease, infections, pressure injuries, and depression. For those patients who encounter challenges leaving their homes, telemedicine appears to be a feasible option where available.¹⁴⁷

Medication changes might happen while in a PAC facility and it is important that the new list of medications is communicated to the patient's health care providers in the community. If the patient is unable to leave the house, it might be helpful to seek for a primary care provider who can provide home visits and establish home delivery pharmacy services. Referral to fall prevention programs also should be part of the care plan at the time of discharge as well as providing services necessary after returning home, either temporarily or permanently.¹⁴⁴

Summary

To an older adult, a hip fracture can be a life-changing or life-ending event. A large proportion of functionally independent patients are not able to ambulate independently after hip fracture or experience functional loss related to impaired balance and mobility.^{139,148,149} Morbidity after a hip fracture is not just physical; there is a high incidence of depression and cognitive impairment (both temporary and permanent). The recovery after a fracture is lengthy, and a relatively high number of patients do not manage to achieve preinjury levels of independence or even survive.

This statement from leaders in hip fracture care and PAC summarizes the best available evidence and is intended to help PAC facilities manage older hip fracture patients more efficiently and effectively, for overall better outcomes regarding function, quality of life, and minimization of complication that can interfere with optimal recovery.




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