

# Pain assessment and management for older patients with hip fractures

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## Abstract

Older patients with hip fractures require a multidisciplinary management approach. Central to these considerations and treatment targets is adequate analgesia, which should be provided as early as possible. An overview of pain assessment and management considerations for patients with hip fractures is provided. There are several tools available to assess severity of pain, such as the Numeric Rating Scale (NRS), Visual Analogue Scale, Pictorial Pain Scale and Verbal Descriptor Scale (VDS). For older people, the NRS and VDS may be preferred. For patients with cognitive impairment, the Pain Assessment in Advanced Dementia (PAINAD) scale or the Pain Assessment Checklist for Seniors with Limited Ability to Communicate (PACSLAC) may be used. Ideally, paracetamol should be provided every 6 hours, with opioids for additional breakthrough pain. If this is inadequate or if there is a requirement to reduce administration of opioids, nerve blocks may be considered. Compared to femoral nerve blocks, fascia-iliaca blocks are potentially easier to learn, safer and well-tolerated. Overall, older patients with hip fractures require adequate analgesia, which involves standardised pain assessment using appropriate tools and multimodal pain management approaches.

## 1. Introduction:

Older patients with hip fractures require a multidisciplinary management approach; ortho-geriatrics models of care providing comprehensive geriatric assessment have been shown to reduce length of hospital stay, dependence of patients and 1-year mortality.<sup>[1][2]</sup> This approach takes into account multiple considerations such as the diagnosis and management of comorbidities, ensuring adequate analgesia, hydration, oxygenation and nutrition, bowel and bladder management, prevention and treatment of delirium, as well as assessment and management of subsequent fall and fracture risk. Early mobilisation, rehabilitation and discharge planning is essential, with a need for individualised plans to continue after hospital discharge to ensure progression of improvement in function and mobility.<sup>[3][4]</sup>

Central to these considerations and treatment targets is adequate analgesia, which should be provided as early as possible. A qualitative study of health-care practitioners in a tertiary hospital found that providing effective pain relief requires clinicians to be less apprehensive regarding prescribing analgesics, with a need to work together as a team to achieve a 'pain-free hospital'.<sup>[5]</sup> There is also a need to standardise pain assessment by ensuring availability of guidelines and pain assessment tools.<sup>[6]</sup> Documentation of pain assessment including descriptors and severity of pain, monitoring of

side effects and response to analgesia is also important.<sup>[7]</sup>

A study of nursing staff from seven university hospitals and ten city-centre hospitals regarding the barriers of post-operative pain management for hip fracture patients found that a significant barrier is pain assessment and resistance to care or restlessness in cognitively impaired patients.<sup>[8]</sup> Fortunately however, a case-control study at a major trauma centre in the United Kingdom found that there were no significant differences in pain management pre-hospital or in the Emergency Department when the management of patients with or without cognitive impairment were compared.<sup>[9]</sup> Other barriers to adequate pain assessment and management include delays in admission and surgery.<sup>[10][11]</sup> Inadequate analgesia also affects recovery and participation in therapy and rehabilitation.

The postoperative pain severity is also affected by the type of surgical procedure performed for the hip fracture. In a prospective study of hip fracture patients all receiving continuous epidural analgesia, the highest post-operative pain levels during hip flexion or walking was in patients with dynamic hip screws and intra-medullary hip screws compared to arthroplasty or parallel screws or pins.<sup>[12]</sup>

An overview of pain assessment and management considerations for patients with hip fractures is provided.

## 2. Pain Assessment:

An observational study in Sweden found that among patients with hip fractures, 86% have moderate to severe pain, with 25% not receiving pain relieving medications.<sup>[13]</sup> A prospective study at a university hospital identified 22% of hip fracture patients experiencing severe pain, with only 27% of hip fracture patients receiving analgesia.<sup>[14]</sup> This should be managed even before arrival to hospital. A qualitative study of older hip fracture patients showed that pre-hospital anxiety and pain relief needed to be improved, as well as a consideration for older people's needs and increased participation, such as providing explanations and clarifying uncertainties regarding management.<sup>[15]</sup>

There are several tools available to assess severity of pain, such as the Numeric Rating Scale (NRS), Visual Analogue Scale, Pictorial Pain Scale and Verbal Descriptor Scale (VDS). For older people, the NRS and VDS may be preferred.<sup>[16]</sup> In the NRS, patients are asked to grade pain between 0 to 10, where 0 is no pain and 10 is the worst imaginable pain. The VDS consists of phrases representing different pain intensities, ranging from no pain, mild pain, moderate pain, severe pain, extreme pain and the most intense pain.<sup>[17]</sup>

For patients with cognitive impairment, the Pain Assessment in Advanced Dementia (PAINAD) scale was shown to be a useful pain assessment tool in the Emergency department. This involves rating five observed aspects that may indicate pain (breathing, vocalisation, facial expression, body language and consolability) between 0 to 2, and providing a total score out of ten to indicate the patient's pain level.<sup>[18]</sup> Alternatively, the Pain Assessment Checklist for Seniors with Limited Ability to Communicate (PACSLAC) providing a checklist of observed findings that may indicate pain may be used. A study comparing the PAINAD and PACSLAC showed that there was greater interrater reliability with the PACSLAC compared to the PAINAD. Nurses did not have a preference between the PAINAD or PACSLAC tools.<sup>[19]</sup>

### **3. Pain Management:**

#### **A. Standard Care:**

Generally, adequate analgesia should be provided immediately for patients presenting with suspected hip fractures, even before presenting to hospital. This is essential to ensure adequate movement for investigations (an ideal hip radiograph requires passive external leg rotation), as well as nursing care. Ideally, paracetamol should be provided every 6 hours, with opioids for additional breakthrough pain. If this is inadequate or if there is a requirement to reduce administration of opioids, nerve blocks may be considered.<sup>[20]</sup>

A main limiting factor of systemic opioids are the side effects, such as sedation or confusion, particularly for older people.<sup>[21]</sup> Tramadol should be used cautiously in older people, as its use has been associated with risk of emergency department presentations, falls, fractures, cardiovascular disease and mortality.<sup>[22]</sup> Thus, the current main pharmacological drug treatment used for pain relief in older people generally involves the use of paracetamol and strong opioids, with a preference away from non-steroidal anti-inflammatory drugs (NSAIDs) and tramadol.<sup>[23]</sup>

#### **B. Other Adjuncts in Pain Management:**

##### **i. Pre-operative skin traction:**

A systematic review and meta-analysis evaluating the efficacy of pre-operative skin traction for patients with hip fractures showed that this offered pain relief within an hour post-admission but not at four to six hours, 12 hours or 24 hours after the admission. Alternative analgesia should be considered in addition to skin traction, as well as early surgical intervention for hip fractures.<sup>[24]</sup>

##### **ii. Intravenous Paracetamol:**

A systematic review showed that pre-operative intravenous paracetamol was effective for pain management in hip fracture patients, with decreased use of breakthrough analgesia, reduced pain scores and length of hospital stay.<sup>[25]</sup> The use of IV Paracetamol was also associated with reduced delirium rates, which may be associated with less opioid use in these patients.<sup>[26]</sup>

### iii. Regional Anaesthesia (Femoral Nerve or Fascia-Iliaca Regional Block):

A randomised controlled trial comparing an ultrasound-guided femoral nerve block to intravenous morphine showed that femoral nerve blocks resulted in significantly reduced pain severity at four hours, reduced the need for rescue opiate analgesia without any difference in adverse events. Interestingly, standard care with parenteral opioids were ineffective for patients with severe pain from hip fractures.<sup>[27]</sup> A systematic review of femoral nerve blocks (single or continuous) administered in the Emergency Department for older patients with hip fractures confirmed its benefits with an associated significant reduction in pain intensity and need for rescue pain relief.<sup>[28]</sup>

A randomised controlled trial comparing fascia-iliaca regional anaesthetic block to intravenous non-steroidal anti-inflammatory drugs (NSAIDs) showed that while parenteral NSAIDs are effective, regional fascia-iliaca blocks were superior in managing hip fracture pain given their rapid onset of action, with effects lasting up to eight hours.<sup>[29]</sup> Compared to femoral nerve blocks, fascia-iliaca blocks are potentially easier to learn, safer and well-tolerated.<sup>[30]</sup> A meta-analysis showed that when both regional block modalities were compared, fascia-iliaca blocks reduced pain scores more at 4 hours after surgery, while femoral nerve blocks were associated with less side effects such as nausea, vomiting and sedation. There were otherwise no other significant differences between both approaches in terms of opiate requirements, time for spinal anaesthesia or patient satisfaction.<sup>[31]</sup>

### 4. Conclusion:

Older patients with hip fractures require adequate analgesia, which involves standardised pain assessment using appropriate tools and multimodal pain management approaches.

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