Power System Technology
ISSN:1000-3673

Received: 02-10-2025 *Revised: 18-11-2025* *Accepted: 27-11-2025*

Emergency Department Orthogeriatric Care and Length of Stay in Hip Fracture Patients: A Retrospective Cohort Study

[1]Saad Majed Bin Jabr AL-Subaie, [2]Abdulelah Othman Al-Abdullah, [3]Faisal Hamdan Awadh AL-Shammari, [4]Naif Hamed Mohammed AL-Otaibi, [5]Munif Turki Munif Al-Otaibi, [6]Ail Mohammed Awadh Al-Amri

[1]Emergenocy Madical Services

[2]Paramedic Assistant

[3]Emergenocy Madical Services

[4]Emergenocy Madical Services

[5]Paramedic Assistant

[6]Paramedic Technician

Abstract: Hip fractures are linked to significant morbidity and death and are a common reason for older persons to visit the emergency department (ED). Orthogeriatric interdisciplinary care models maximize perioperative management and enhance care for these vulnerable patients by enabling early clinical assessment, quick diagnostics, and customized analgesia by regional anesthesia (RA). There is still a lack of research on the precise effects of these models on ED length of stay (LOS). This study evaluated the impact of an orthogeriatric fast-track based on a multidisciplinary treatment approach on ED LOS. Secondary goals included assessing how this implementation affected the rate of complications, early death, and analgesia effectiveness in ED. Method: Patients with hip fractures who were 65 years of age or older were included in this monocentric observational retrospective cohort, which was conducted in a Swiss emergency department both before and after fast-track deployment. Polytrauma, incapacity to give consent, and RA contraindication or patient rejection were the exclusion criteria. ED LOS was the main result. Secondary outcomes were 30-day mortality, 72-hour complications rate, and analgesic efficiency in the ED (i.e., NRS reduction, cumulative opioid intake). For quantitative variables, the Wilcoxon rank sum test was employed, and for qualitative variables, Fisher's test. In conclusion:An orthogeriatric fast-track approach is linked to a decreased early death rate and a considerable reduction in ED LOS. There is no opioid sparing effect, although analgesia efficiency is positively influenced.

Keywords: Emergency Department, Orthogeriatric Care, A Retrospective Cohort Study, Fracture Patients, Length of Stay.

Introduction:

37.8% of visits to a Swiss regional hospital are made by elderly patients, who frequently visit the emergency department (ED). This population's use of ED is predicted to rise during the coming decades due to demographic changes. Elderly individuals are more likely than younger patients to visit the emergency department, remain longer, and need more medical resources. A significant and increasing percentage of inpatient admissions in Switzerland are caused by major osteoporotic fractures in the elderly population, such as hip, radius, and vertebral fractures. By 2050, their total population is predicted to almost treble, placing strain on inpatient care facilities

Power System Technology
ISSN:1000-3673

Received: 02-10-2025 *Revised: 18-11-2025* *Accepted: 27-11-2025*

and emergency rooms (Woitok , 2021; Lippuner, 2022; Mahmood, 2024).

There are many difficulties in caring for elderly patients. The intricacy of treating acute injuries in patients who present with derangements because of age and comorbidities is addressed by the notion of orthogeriatric therapy. To improve outcomes in this population, a number of institutional frameworks and care models have been developed. on order to assess and arrange management on a "fast-track pathway" upon arrival in the ED, these models usually need a multidisciplinary partnership. Such paths have been demonstrated in earlier research to reduce mortality and minimize hospital stays and operation times. An essential component of orthogeriatric therapy is pain control. Standard analgesics, particularly opioids, are more likely to cause side effects in older people and have been associated with higher rates of morbidity and mortality (Carpenter , 2010; Fletcher, 2003).

Prolonged length of stay (LOS) adds to ED overcrowding, which puts a pressure on few resources and lowers care quality from an ED organizational standpoint. A prolonged ED length of stay (LOS) raises the risk of delirium and increases mortality for the particular elderly patient. Older patients stay longer in the emergency department (ED) than their younger colleagues when they have orthopaedic injuries. Longer diagnosis times, TTS, and insufficient analgesia are the causes of this. To our knowledge, no study has examined the effect of comprehensive orthogeriatric treatment on ED LOS in geriatric hip fractures, yet it may address these issues (Lippuner , 2022; Henderson , 2008).

In contrast, shorter treatment durations were recorded in other traumatic orthopaedic settings. In general, until RA is incorporated into a systematic multidisciplinary approach, it does not seem to reduce ED LOS on its own (Garofoli , 2019; Svedbom , 2014).

The purpose of this retrospective observational study is to determine whether the use of an orthogeriatric multidisciplinary fast-track lowers ED length of stay (LOS) in elderly patients with hip fractures. The influence on analgesic efficacy, perioperative complications at 72 hours, and 30-day mortality are secondary goals.

Methods:

This was an observational, retrospective, single-center cohort study. The STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) principles were followed in conducting the study. The scene was the emergency department of the Fribourg State Hospital in Switzerland, which has 42,000 patients annually.

Before consulting the orthopedic team, patients were first evaluated by an emergency resident who spoke with a supervisory physician. The availability of resources was a major factor in the timing of both the analgesic strategy and diagnostic imaging. The anesthesia team did not participate in ED analgesic methods; they were only involved in surgical planning. The OFT functions as follows: An alarm is transmitted to the ED if emergency medical personnel in the prehospital setting detect a hip fracture (i.e., external rotation and/or shortening of the affected leg). A senior ED doctor orders diagnostic imaging (plain radiography) as soon as a patient arrives and confirms clinical suspicion. The anesthesia and orthopaedic teams are notified if a femur fracture is identified and there are no contraindications. This enables timely assessment and perioperative planning for both teams. Although the anesthesia staff was able to arrange the procedures based on their availability, their goal was to finish RA as soon as possible.

Results: This retrospective study showed that an orthogeriatric fast-track for hip fractures based on a multidisciplinary treatment approach significantly reduced ED length of stay, enhanced analgesia, and increased short-term survival.

Power System Technology
ISSN:1000-3673

Received: 02-10-2025 *Revised: 18-11-2025* *Accepted: 27-11-2025*

The Effects of an Emergency Department Length of Stay route:

This is the first study that explicitly examines the effects of an ED LOS route. Faster imaging and earlier clinical identification are substantially responsible for the significant decrease in LOS seen in the intervention group. The first clinical examination and radiological diagnosis were made quickly, as seen by the mean TTC of 41 minutes. Additional clinical concerns (e.g., internal medicine and geriatric assessments, pain management), complementary imaging (e.g., CT scan), and organizational procedures (e.g., bed management, approval for transfer, coordination of transfer) accounted for the remaining time in the ED (mean 139 min) (Vestergaard , 2007; Van , 2022; Sri, 2024).

This study does not account for each of these factors' impact to the amount of time spent in the ED, and more research is necessary to determine other optimization goals. This effort is crucial because, in comparison to younger patients, ED LOS has a disproportionately large influence on the mortality and morbidity of older patients. This is especially true for the elderly population, who are more affected by it and have longer ED LOS. A continuous problem is the anticipated rise in elderly ED visits, some of which are related to traumatic problems. It is crucial to design organizational solutions to provide optimal patient flow and high-quality care for the elderly (Sri, 2024; Chen , 2022).

That multidisciplinary treatment:

Contrary to earlier findings, the intervention group had a shorter time to surgery, although this difference was not statistically significant. Sample size and organizational variations are probably to blame for this. Another argument could be that multidisciplinary treatment delays surgery to enable excellent perioperative care (e.g., daytime surgery with an expert surgical team, after medical optimization) by providing optimal pain management. The observed decrease in early mortality and lethal complications may have been facilitated by this organizational flexibility (Snapp , 2024; Chuan, 2020).

Despite comparable opioid usage, the intervention group showed a significant improvement in analgesia efficacy as judged by NRS reduction. These findings are in line with earlier research demonstrating that early RA during hospital stays increases the effectiveness of analgesics (Beaudoin , 2013).

There was no change in ED LOS in the only RCT looking into RA for hip fractures that was conducted solely in the ED. Therefore, RA may need to be done early in the ED stay in order to ensure a short ED LOS while positively influencing opioid usage. More research is needed to determine the viability and effects of this strategy. In addition to the lack of the anticipated opioid-sparing impact, the intervention group's median opioid use was surprisingly greater. This difference, however, was not statistically significant and might be the result of medical and nursing staff members being more clinically knowledgeable of how to provide appropriate analgesia in this situation (Cogan , 2020; Falyar , 2019; Gadsden , 2015).

This emphasizes the need to modify the current method to reduce delirium and save opioids. For such an adaptation to be possible, patients with severe pain might benefit from very early RA performance, whereas patients with lower NRS could be treated with tight non-opioid analgesia until RA could be conducted. Another viable tactic to increase the OFT's organizational effectiveness is to train the emergency department in certain ultrasound-guided regional anesthetic techniques.

Recommendations:

The intervention group had much lower early mortality and fewer fatal complications, despite the fact that minor, moderate, and severe problems were equivalent across groups. These results imply that the orthogeriatric fast-

Power System Technology
ISSN:1000-3673

Received: 02-10-2025 *Revised: 18-11-2025* *Accepted: 27-11-2025*

track offers real survival benefits in addition to better treatment coordination. An independent risk factor for higher hospital morbidity and mortality is ED LOS. Our findings demonstrate the critical role of the ED in facilitating such effects, despite the fact that the mortality benefit of multidisciplinary models is multifactorial. A lower rate of delirium is a result of both an opioid-sparing strategy and a decrease in ED length of stay. Both the minimal time below which the quality of care can no longer be assured and the optimal LOS to reduce the incidence of delirium are poorly characterized. The intervention group's ED LOS, however, was far lower than what has been linked to delirium.

This study has limitations: Generalizability is limited by its retrospective methodology, monocentric setting, and small sample size. Confounding factors could not be controlled due to the study design. However, when it came to the main potential confounding variables (such as age, sex, BMI, comorbidities, and CFS), the groups were similar. Additionally, the OFT route continued to be independently linked to a 46% decrease in ED LOS after controlling for the most important predictors, demonstrating that confounding variables could not account for the observed effect. To validate these results and evaluate cost-effectiveness and long-term effects, larger prospective multicenter trials are needed.

However, the findings align with studies conducted in other domains of orthogeriatric treatment. The effectiveness of analgesia was evaluated subjectively (e.g., NRS decrease). Nonetheless, analgesic research generally accepts this surrogate, and our findings are consistent with the available data. 16% of the NRS pain scores in our cohort were missing. This percentage is in line with earlier findings in emergency geriatric populations, where acute clinical circumstances, cognitive impairment, or communication obstacles frequently make systematic pain evaluation challenges.

Lastly, an awareness effect during the early stages of OFT implementation may be responsible for the decrease in ED LOS. To determine whether this benefit is sustainable and to separate the influence of the orthogeriatric approach from organizational adaptability, more long-term assessments are required. These restrictions prevent the drawing of any causal conclusions.

Conclusion:

In older patients with hip fractures, the use of an orthogeriatric multidisciplinary fast-track was linked to reduced early mortality, better analgesic efficacy, and a shorter ED length of stay. Although confirmation in larger multicenter trials is required before broad use, these findings support the early beginning of multimodal care models upon ED admission. Although the retrospective, single-center design of this study limits causal inference and generalizability, and confirmation through larger prospective multicenter trials is necessary before widespread adoption, the observed benefits highlight the potential value of initiating structured, multimodal orthogeriatric care at the point of ED admission. Early integration of such models may represent an effective strategy to improve both efficiency of care delivery and short-term clinical outcomes for older patients with hip fractures.

References:

1. Woitok BK, Ravioli S, Funk GC, Lindner G. Characteristics of very elderly patients in the emergency department – A retrospective analysis. Am J Emerg Med. 2021;46:200–3.

2. Carpenter CR, Stern ME. Emergency orthogeriatrics: concepts and therapeutic alternatives. Emerg Med Clin North Am. 2010;28(4):927–49.

Power System Technology
ISSN:1000-3673

Received: 02-10-2025 *Revised: 18-11-2025* *Accepted: 27-11-2025*

3. Lippuner K, Rimmer G, Stuck AK, Schwab P, Bock O. Hospitalizations for major osteoporotic fractures in switzerland: a long-term trend analysis between 1998 and 2018. Osteoporos Int. 2022;33(11):2327–35.

4. Garofoli R, Maravic M, Ostertag A, Cohen-Solal M. Secular trends of hip fractures in france: impact of changing characteristics of the background population. Osteoporos Int J Establ Result Coop Eur Found Osteoporos Natl Osteoporos Found USA. 2019;30(2):355–62.

5. Svedbom A, Ivergård M, Hernlund E, Rizzoli R, Kanis JA. Epidemiology and economic burden of osteoporosis in Switzerland. Arch Osteoporos. 2014;9(1):187.

6. Vestergaard P, Rejnmark L, Mosekilde L. Increased mortality in patients with a hip fracture-effect of pre-morbid conditions and post-fracture complications. Osteoporos Int. 2007;18(12):1583–93.

7. Van Heghe A, Mordant G, Dupont J, Dejaeger M, Laurent MR, Gielen E. Effects of orthogeriatric care models on outcomes of hip fracture patients: A systematic review and Meta-Analysis. Calcif Tissue Int. 2022;110(2):162–84.

8. Sri-On J, Worawiwat T, Luksameearunothai K, Nirunsuk P, Vanichkulbodee A, Fusakul Y, et al. Enhancing emergency department pain management for older adults with the hip fracture Fast-Track (HFFT) protocol in a Middle-Income country. Clin Interv Aging. 2024;19:1225–33.

9. Chen Y, Liang S, Wu H, Deng S, Wang F, Lunzhu C, et al. Postoperative delirium in geriatric patients with hip fractures. Front Aging Neurosci. 2022;14:1068278

10. Chuan A, Zhao L, Tillekeratne N, Alani S, Middleton PM, Harris IA, et al. The effect of a multidisciplinary care bundle on the incidence of delirium after hip fracture surgery: a quality improvement study. Anaesthesia. 2020;75(1):63–71.

11. Beaudoin FL, Haran JP, Liebmann O. A comparison of ultrasound-guided three-in-one femoral nerve block versus parenteral opioids alone for analgesia in emergency department patients with hip fractures: a randomized controlled trial. Acad Emerg Med Off J Soc Acad Emerg Med. 2013;20(6):584–91.

12. Cogan CJ, Kandemir U. Role of peripheral nerve block in pain control for the management of acute traumatic orthopaedic injuries in the emergency department: Diagnosis-based treatment guidelines. Injury. 2020;51(7):1422–5.

13. Falyar C, Tola D. Ultrasound-guided fascia Iliaca blocks in the emergency department. Geriatr Nur (Lond). 2019;40(4):441–4.

14. Fletcher AK, Rigby AS, Heyes FLP. Three-in-one femoral nerve block as analgesia for fractured neck of femur in the emergency department: A randomized, controlled trial. Ann Emerg Med. 2003;41(2):227–33.

15. Gadsden J, Warlick A. Regional anesthesia for the trauma patient: improving patient outcomes. Local Reg Anesth. 2015;8:45–55.

16. Henderson K, Akhtar S, Sandoval M, Siddiqui S, Todd K, Wirtner A. 399: femoral nerve block for pain management of hip fractures in the emergency department: preliminary results of a Randomized, controlled trial. Ann Emerg Med. 2008;52(4):S164

17. Mahmood SMJ, Bhana,Nikhil B, Kong, Clarence, Theyyunni, Nik, ,William S et al. J, Kropf, Charles W,. Ultrasound-guided regional anesthesia (UGRA) in the emergency department: a scoping review. Pain Manag. 2024;14(10–11):571–8.