

Abstract

Improving ED Time to Regional Anesthesia in Hip Fracture Patients

Background:

The incidence of hip fractures has increased globally with the U.S. having higher rates of hip fractures compared to other countries.^{1,2} Pain from hip fractures is often managed with opioids that can have negative impacts on elderly populations that are more likely to develop delirium from opioids.³ Conversely, poor pain management is also a risk factor for delirium that can prolong hospital stays and increase morbidity and mortality in elderly patients.^{4,5} Use of regional anesthesia, including the pericapsular nerve block group (PENG) and fascia iliaca block (FIB), can both improve pain management and decrease opioid use and help minimize risk of delirium, particularly in elderly populations.⁶

Scope:

As appropriate and timely use of regional anesthesia has demonstrated positive improvement both in patient centered outcomes and in utilization of hospital resources, we believe advancement in this area to be a necessary goal. In this project, we aim to shorten the time to regional anesthesia in patients who present to the HCMC ER by 25% within 6 months of intervention.

¹ Dhanwal DK, Dennison EM, Harvey NC, Cooper C. Epidemiology of hip fracture: Worldwide geographic variation. *Indian J Orthop*. 2011;45(1):15-22. doi:10.4103/0019-5413.73656

² Dong Y, Zhang Y, Song K, Kang H, Ye D, Li F. What was the Epidemiology and Global Burden of Disease of Hip Fractures From 1990 to 2019? Results From an Additional Analysis of the Global Burden of Disease Study 2019. *Clin Orthop Relat Res*. 2023;481(6):1209-1220. doi:10.1097/CORR.0000000000002465

³ Morrison RS, Magaziner J, Gilbert M, et al. Relationship between pain and opioid analgesics on the development of delirium following hip fracture. *J Gerontol A Biol Sci Med Sci*. 2003;58(1):76-81. doi:10.1093/gerona/58.1.m76

⁴ Leslie DL, Marcantonio ER, Zhang Y, Leo-Summers L, Inouye SK. One-year health care costs associated with delirium in the elderly population. *Arch Intern Med*. 2008;168(1):27-32. doi:10.1001/archinternmed.2007.4

⁵ Clegg A, Young JB. Which medications to avoid in people at risk of delirium: a systematic review. *Age Ageing*. 2011;40(1):23-29. doi:10.1093/ageing/afq140

⁶ Garlich JM, Pujari A, Debbi EM, et al. Time to Block: Early Regional Anesthesia Improves Pain Control in Geriatric Hip Fractures. *J Bone Joint Surg Am*. 2020;102(10):866-872. doi:10.2106/JBJS.19.01148

Methods & Intervention:

Root cause analysis has revealed several areas of improvement and roadblocks. These include but are not limited to provider variability in procedure familiarity, availability of time to perform procedure, delay in diagnosis, co-management with consulting services, and patient preference. Preliminary data collection will focus on evaluating the median time to regional anesthesia or “hip block” using EPIC Slicer/Dicer within the last 1 year to develop the starting time. We expect significant variability in this data set as described in our root cause analysis and have chosen mean analysis to limit outlier skewing of the data set. Data collection will focus on pericapsular nerve group (PENG) and fascia iliaca blocks (FIB) as they have been identified as the two most common nerve blocks used by ED providers in our department. Our intervention will focus on utilizing the research assistants (RAs) present in our Emergency Department to remind providers of the utility of hip blocks for patients who may benefit. By monitoring the ED trackboard for chief complaints that may result in hip fractures and asking providers simple questions, we believe it will encourage providers to begin considering regional anesthesia more quickly. Data will be collected monthly on median time to block to determine if adjustments need to be made. Secondary outcomes for hip fracture patients will be collected including opioid equivalents utilized and incidence of hospital-acquired delirium.

Impact and Next Steps:

We believe that improvement in this area will benefit our patients greatly, particularly in geriatric patients where management of pain with opioid medications can potentiate great harm. Furthermore, by establishing a practice pattern that considers regional anesthesia sooner, we hope that improvements will continue after the QI intervention timeframe has passed. We also believe that should we be able to demonstrate improvement in this area, we may also be able to expand interventions into other areas where regional anesthesia may benefit; such as, midshaft humerus fractures, shoulder reductions, hip reductions, and rib fractures.

Sources

- Dhanwal DK, Dennison EM, Harvey NC, Cooper C. Epidemiology of hip fracture: Worldwide geographic variation. *Indian J Orthop*. 2011;45(1):15-22. doi:10.4103/0019-5413.73656

<https://pmc.ncbi.nlm.nih.gov/articles/PMC3004072/>

“The highest hip fracture rates are seen in North Europe and the US and lowest in Latin America and Africa.”

- Dong Y, Zhang Y, Song K, Kang H, Ye D, Li F. What was the Epidemiology and Global Burden of Disease of Hip Fractures From 1990 to 2019? Results From and Additional Analysis of the Global Burden of Disease Study 2019. *Clin Orthop Relat Res*. 2023;481(6):1209-1220. doi:10.1097/CORR.0000000000002465

<https://pubmed.ncbi.nlm.nih.gov/36374576/>

“Hip fractures are common, devastating to patients, and economically burdensome to healthcare systems globally, with falls being the leading cause. The age-standardized incidence rate has slightly increased in men.”

- Garlich JM, Pujari A, Debbi EM, et al. Time to Block: Early Regional Anesthesia Improves Pain Control in Geriatric Hip Fractures. *J Bone Joint Surg Am*. 2020;102(10):866-872. doi:10.2106/JBJS.19.01148

<https://pubmed.ncbi.nlm.nih.gov/32195685/>

Conclusions: Faster TTB in geriatric patients with hip fracture may reduce opioid use, pain, and length of stay. (looking at fascia iliaca)

- Morrison RS, Magaziner J, Gilbert M, et al. Relationship between pain and opioid analgesics on the development of delirium following hip fracture. *J Gerontol A Biol Sci Med Sci*. 2003;58(1):76-81. doi:10.1093/gerona/58.1.m76

<https://academic.oup.com/biomedgerontology/article/58/1/M76/582409>

Conclusions. Using admission data, clinicians can identify patients at high risk for delirium following hip fracture. Avoiding opioids or using very low doses of opioids increased the risk of delirium. Cognitively intact patients with undertreated pain were nine times more likely to develop delirium than patients whose pain was adequately treated. Undertreated pain and inadequate analgesia appear to be risk factors for delirium in frail older adults.

- Clegg A, Young JB. Which medications to avoid in people at risk of delirium: a systematic review. *Age Ageing*. 2011;40(1):23-29. doi:10.1093/ageing/afq140

<https://academic.oup.com/ageing/article/40/1/23/11754>

Conclusion: for people at risk of delirium, avoid new prescriptions of benzodiazepines or consider reducing or stopping these medications where possible. Opioids should be prescribed with caution in people at risk of delirium, but this should be tempered by the observation that untreated severe pain can itself trigger delirium. Caution is also required when prescribing dihydropyridines and antihistamine H1 antagonists for people at risk of delirium and considered individual patient assessment is advocated.

- Leslie DL, Marcantonio ER, Zhang Y, Leo-Summers L, Inouye SK. One-year health care costs associated with delirium in the elderly population. *Arch Intern Med*. 2008;168(1):27-32. doi:10.1001/archinternmed.2007.4

<https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/413696>

Conclusions The economic impact of delirium is substantial, rivaling the health care costs of falls and diabetes mellitus. These results highlight the need for increased efforts to mitigate this clinically significant and costly disorder.