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# Injected local anesthetic use for hip fracture patients on the day of hospital presentation: a national database analysis

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## Introduction

Hip fractures are a commonly cited indication for nerve blocks performed in emergency departments<sup>1-3</sup> as these patients have significant comorbidities, putting them at high risk for adverse effects from opioid analgesics. Nerve blocks prior to surgical intervention for hip fractures can reduce pain, confusion and opioid analgesic consumption.<sup>4</sup>

There are efforts by emergency medicine and acute pain societies to promote the increased use of ultrasound guided regional anesthesia for hip fracture patients. These groups cite a perceived underutilization of nerve blocks on the day of hospital presentation, prior to surgery and in emergency departments.<sup>5</sup> Currently, it is not known how often blocks, or even local anesthetics, are used in the acute setting for hip fracture patients. We hypothesize an increasing proportion of hip fracture patients that receives local anesthetics on the day of hospital presentation, as multimodal opioid sparing analgesia options are becoming more widely adopted. In this study, we use a national dataset to describe trends in injected local anesthetic utilization for hip fracture patients on the day of hospital presentation.

## Materials and Methods

This study was approved by the institutional review board of the Hospital for Special surgery (IRB#2012-050). From the Premier Healthcare database (Premier Healthcare Solutions, Inc., Charlotte, NC; 2009-2019) we identified hip fracture patients using a standard set of international classification of diseases -ninth/tenth revision (ICD-9/10codes; appendix 1). Patients were excluded if they were <18 years old (N=8382) or had missing data on sex (N=323) or discharge date (N=3125). Utilization of injectable local anesthetics (bupivacaine, ropivacaine, mepivacaine, and lidocaine) was determined from medication billing records and physician order entry on the day of admission. Trends were evaluated using Cochran-Armitage Trend Tests. A p-value <0.05 was used as the cutoff for statistical significance. Analyses were performed with SAS version 9.4 (SAS Institute, Cary, NC).

## Results/Case Report

Among 864,416 patients with an emergency admission due to a hip fracture (2009-2019) the rate of lidocaine use on the day of admission increased from 28.4% in 2009 to 41.0% in 2019; this was 13.3% to 18.6% for bupivacaine, 2.0% to 8.4% for ropivacaine, and 0.05% to 0.14% for mepivacaine (Figure

1, all trends  $p < 0.001$ ). These data represent 1012 hospitals with a substantial between-hospital variation in local anesthetic use in these patients: interquartile range for any local anesthetic use 19.8-60.2%. In the cohort, only 1126 (0.11%) of patients underwent surgery on the day of hospital presentation.

## Discussion

Over the 10-year study period, the use of injectable local anesthetics on the day of presentation increased among hip fracture patients. This pattern could represent increased adoption of opioid sparing techniques. The use of longer acting local anesthetics, specifically ropivacaine and bupivacaine suggests that there is likely a trend towards sustained pain treatment being initiated early in admissions. The data we present suggest that an increasing number of hip fracture patients are exposed to longer acting local anesthetics on the day of admission. Our data suggest that patients are more routinely receiving treatment with local anesthetics prior to surgery. As the access to presurgical ultrasound guided nerve blocks increases, communication between specialties will be essential to avoid the risk of local anesthetic toxicity. Additionally, it will be important for acute pain physicians to know if their patient has previously received treatment with local anesthetics prior to performing an ultrasound guided nerve block. This study has limitations. From the medication reports, we can only interpret that the patient received the medication. We are unable to determine if the medication was administered as a nerve block, a field block, or as local infiltration. Additionally, we cannot determine who was injecting the local anesthetic, whether it was an emergency medicine physician, surgeon, anesthesiologist, or other providers. In conclusion, hip fracture patients are increasingly being treated with both short acting and long acting injectable local anesthetics on the day of hospital presentation.

## References

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## Disclosures

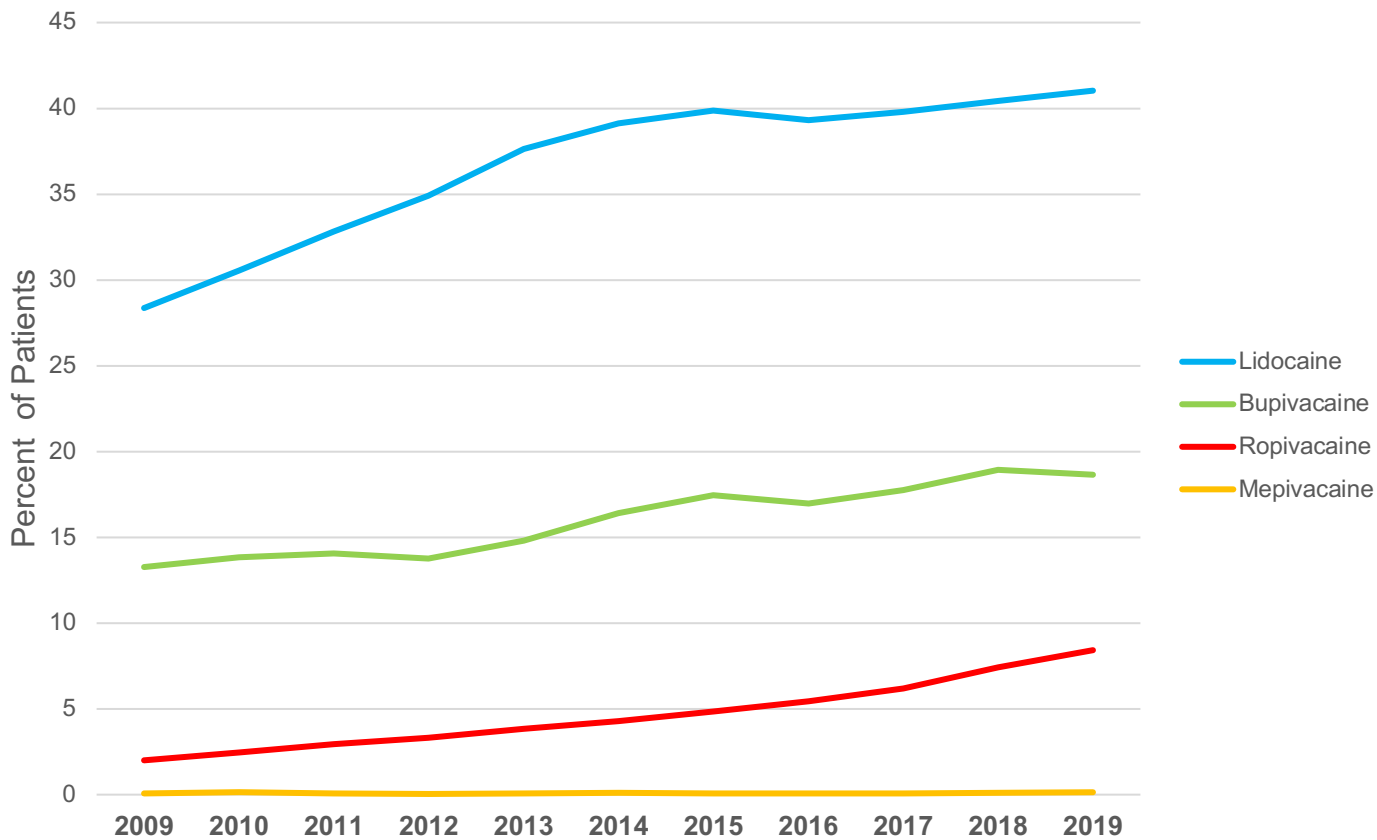
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## Tables / Images

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Percent of Hip Fracture Patients Receiving Local Anesthetics



**Appendix 1. Diagnosis and Procedure Codes for Hip Fracture Based on International Classification of Diseases 9th (ICD-9) and 10th Revision (ICD-10) Codes**

<b>Description</b>	<b>ICD-9</b>	<b>ICD-10</b>
<b>Diagnosis</b>		
Subtrochanteric fracture of femur	820.21, 820.31	S72.2
Pertrochanteric fracture	820.22, 820.32	S72.1
Fracture of head and neck of femur	820.0X, 820.10, 820.11, 820.12, 820.13, 820.19, 820.8X, 820.9X	S72.0
<b>Procedure</b>		
Total hip arthroplasty	81.40, 81.51, 81.53	0SR90XX, 0SRB0XX
Hemiarthroplasty	81.52	0SRAXX, 0SREXX, 0SRRXX, 0SRSXX
internal fixation	78.55, 79.15, 79.25, 79.35, 79.55, 79.65, 79.85, 79.95	0QS6XX, 0QS7XX, 0QS8XX, 0QS9XX, 0QSBXX, 0QSCXX, 0SS9XX, 0SSBXX, 0QH6XX, 0QH7XX, 0QH8XX, 0QH9XX, 0QHBXX, 0QHC, 0QB6XX, 0QB7XX, 0QB8XX, 0QB9XX, 0QBBXX, 0QBC, 0QQ6XX, 0QQ7XX, 0QQ8XX, 0QQ9XX, 0QQBXX, 0QQC
Other hip procedures	00.85, 00.86, 00.87, 00.7X	0SURXX, 0SUSXX, 0SUAXX, 0SUEXX, 0SP9XX, 0SPAXX, 0SPBXX, 0SPEXX, 0SPRXX, 0SPSXX,