

Regional anesthesia cuts length of stay, mortality vs. general anesthesia in hip fracture surgery

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Patients who received regional anesthesia during hip fracture surgery had moderately lower mortality and a significantly lower length of stay than those who received general anesthesia, according to new research from the Perelman School of Medicine at the University of Pennsylvania. The study, published this week in *JAMA*, employed a new, more reliable Penn-developed technique for comparative-effectiveness research to pinpoint best practices. In a related study published in *JAMA Internal Medicine* this week, the team also reported high rates of mortality and functional disability among nursing home residents treated for hip fracture.

About 300,000 hip fractures occur each year in the United States. These are often a result of serious falls that can result in various degrees of functional impairment. They are twice as common among nursing home residents.

"This is a problem that is likely to become progressively more important as the population ages," says Mark Neuman, MD, MSc, lead author on both studies and assistant professor of Anesthesiology and Critical Care and Senior Fellow in the Leonard Davis Institute of Health Economics at the Perelman School of Medicine at the University of Pennsylvania. "We wanted to understand to what degree anesthesia played a role in outcomes after [hip fracture](#) surgery."

Recent guidelines have called for broader use of [regional anesthesia](#) – in which anesthesia is delivered directly to the affected region of the body—in hip fracture surgery versus [general anesthesia](#), which renders the patient temporarily unconscious through the use of intravenous drugs and inhaled gasses (anesthetics), as it is thought to reduce post-operative complications and morbidity.

In the JAMA study, the Penn team compared the anesthesia technique with 30-day mortality and length of stay among 56,729 [patients](#), all over age 50, who were hospitalized with a hip fracture diagnosis in New York State between 2004 and 2011. Of these, 15,904 (28 percent) received regional anesthesia and 40,825 (72 percent) received general anesthesia during surgery. The patients studied were drawn from data on hospital discharges from New York's statewide Planning and Research Cooperative System (SPARCS).

Researchers found that 30-day mortality was not statistically significant at 5.3 percent for regional anesthesia patients compared with 5.4 percent for general anesthesia patients. There was however a greater difference in length of stay, with regional anesthesia associated with a length of stay of 6 days versus a longer 6.3 days in patients who received general anesthesia.

"A key innovation of this study was its use of new statistical methods to address biases created by the fact that patients who receive regional anesthesia tend to be older and sicker than those treated with general anesthesia," says Neuman.

To address this bias, Neuman and colleagues employed a technique to simulate the structure of a randomized trial within a retrospective study. Because patterns of anesthesia care differ between hospitals, the Penn team was able to use the distance from each patient's home address to the nearest hospital that specialized in regional anesthesia as a natural

source of randomization to regional versus general anesthesia. According to Neuman, "patients who lived closer to hospitals that specialized in regional anesthesia were more likely to get regional anesthesia in the event of a hip fracture; patients who lived closer to hospitals that specialized in general anesthesia rarely got regional anesthesia."

By comparing outcomes between similar patients who lived relatively closer to, or further from, hospitals that specialized in regional anesthesia, Neuman and colleagues estimated that regional anesthesia was associated with more than half a day shorter length of stay after hip fracture surgery, although they did not find evidence for a significant difference in 30-day mortality according to anesthesia type.

"Our findings suggest an association between regional anesthesia and shorter length of stay, which could relate to a reduction in complications or more effective rehabilitation," says Neuman. "Our study highlights the need for a definitive, prospective randomized trial to determine the best way of caring for hip fracture patients."

In the *JAMA Internal Medicine* study, the team retrospectively analyzed the patterns of survival and dependence on the use of walkers, canes, and other walking assist devices at six months and one year following hip fracture; changes in the ability to perform the seven essential activities of daily living (ADLs); and identify risk factors associated with survival following treatment in 60,111 patients. The data for this study was culled from Medicare claims and the Nursing Home Minimum Data Set.

Hip fracture was found to be associated with substantial mortality and dependency in performing ADLs. By 180 days postfracture, more than one in three patients had died. Among patients who were fully independent or required limited assistance with movement before their injury, one in five survived to regain their prefracture level of independence 180 days later, with similar patterns observed for ADLs,

including transferring, mobility in bed, personal hygiene and toileting.

Approximately 12 percent of patients in the study sample received nonoperative management of their injury, which was associated with greater risk of death and complete dependence on assistance devices for all movement, within 180 days compared with surgical repair. In addition, white men of increased age with many comorbidities, cognitive impairment and poor baseline ADL dependence were also associated with a high risk of death following hip fracture.

"Residents of long-term care facilities represent a highly vulnerable population. Prevention of hip fracture should be paramount, but clinical care, should a fracture occur, should consider the high probability of death and functional disability among these patients postfracture," says Neuman. "At the same time, our findings of substantially worse outcomes with non-operative management suggest that surgical treatment may still be a reasonable option if it is consistent with the patient's long-term goals of care."

More information: *JAMA*, [DOI: 10.1001/jama.2014.6499](https://doi.org/10.1001/jama.2014.6499)

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