

# Comparing Outcomes of an Anterior vs. Posterior Approach to Lumbar Spinal Fusion with Interbody Device

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## Objective

Interbody devices have revolutionized lumbar spinal fusion surgery by improving mechanical stability and maximizing fusion potential. Several techniques for interbody fusion exist, including anterior lumbar interbody fusion (ALIF), posterior lumbar interbody fusion (PLIF), extreme lateral interbody fusion (XLIF), direct lateral interbody fusion (DLIF), and transforaminal lumbar interbody fusion (TLIF). These techniques can be classified under an anterior or posterior approach. Both methods offer varying benefits, however, no clear evidence for a superior approach exists. This study aims to compare the in-hospital outcomes between an anterior vs. posterior approach to lumbar interbody fusion.

## Design & Methods

This retrospective cohort study utilized the Healthcare Cost and Utilization Program (HCUP) Nationwide Inpatient Sample (NIS) to identify patients (18+) from 2016-2018 who underwent lumbar interbody fusion under an anterior or posterior approach using International Classification of Diseases, 10<sup>th</sup> edition (ICD10) codes. ICD10 codes classify ALIF, XLIF, and DLIF under anterior approach (AA), and PLIF and TLIF under posterior approach (PA). Both open and percutaneous surgical methods were included. Patients were further divided by status of comorbid obesity, diabetes mellitus (DM), and hypertension (HTN). Patients missing identifiers (age, gender, death) were excluded. Data analysis compared length of stay (LOS), total hospital charges, mortality, age of admission, comorbid status, and risk of post-surgical pseudoarthrosis.

## Results

Of the 74,445 patients who underwent lumbar interbody fusion, 51,323 (69%) underwent PA and 23,122 (31%) underwent AA. PA was associated with increased age at admission (62.17 vs 60.45 years,  $p < 0.0001$ ), decreased LOS (3.59 vs 4.19 days,  $p < 0.0001$ ), decreased total hospital charges (\$141,700.94 vs \$211,015.88,  $p < 0.0001$ ), and decreased risk of pseudoarthrosis (3.05% vs 6.37%,  $p < 0.0001$ ) when compared to AA. There was no significant difference between PA vs AA mortality rate (0.09% vs 0.16%,  $p > 0.05$ ) or presence of comorbid obesity (15.01% vs 16.12%,  $p > 0.05$ ), DM (20.63% vs 17.62%,  $p > 0.05$ ), and HTN (54.20% vs 52.44%,  $p > 0.05$ ).

## Conclusions

Patients who underwent AA suffered from increased hospital charges, LOS, and risk of post-surgical pseudoarthrosis when compared to those who underwent PA. Presence of comorbid obesity, DM, and HTN were not significantly different between PA and AA groups, and therefore does not likely account for the difference of surgical outcomes. These results indicate PA may be a superior approach to lumbar interbody fusion. Further investigation is warranted to explain the difference in outcomes.

## Acknowledgments

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Figure 1. Patient Data Selection

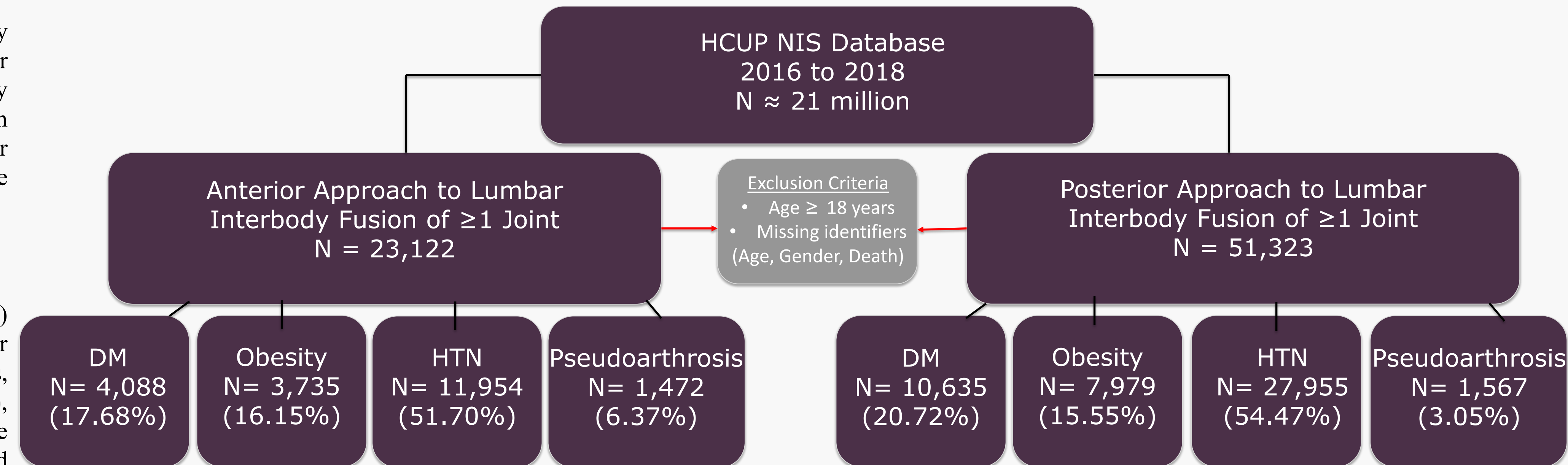


Figure 2. Average Length of Stay

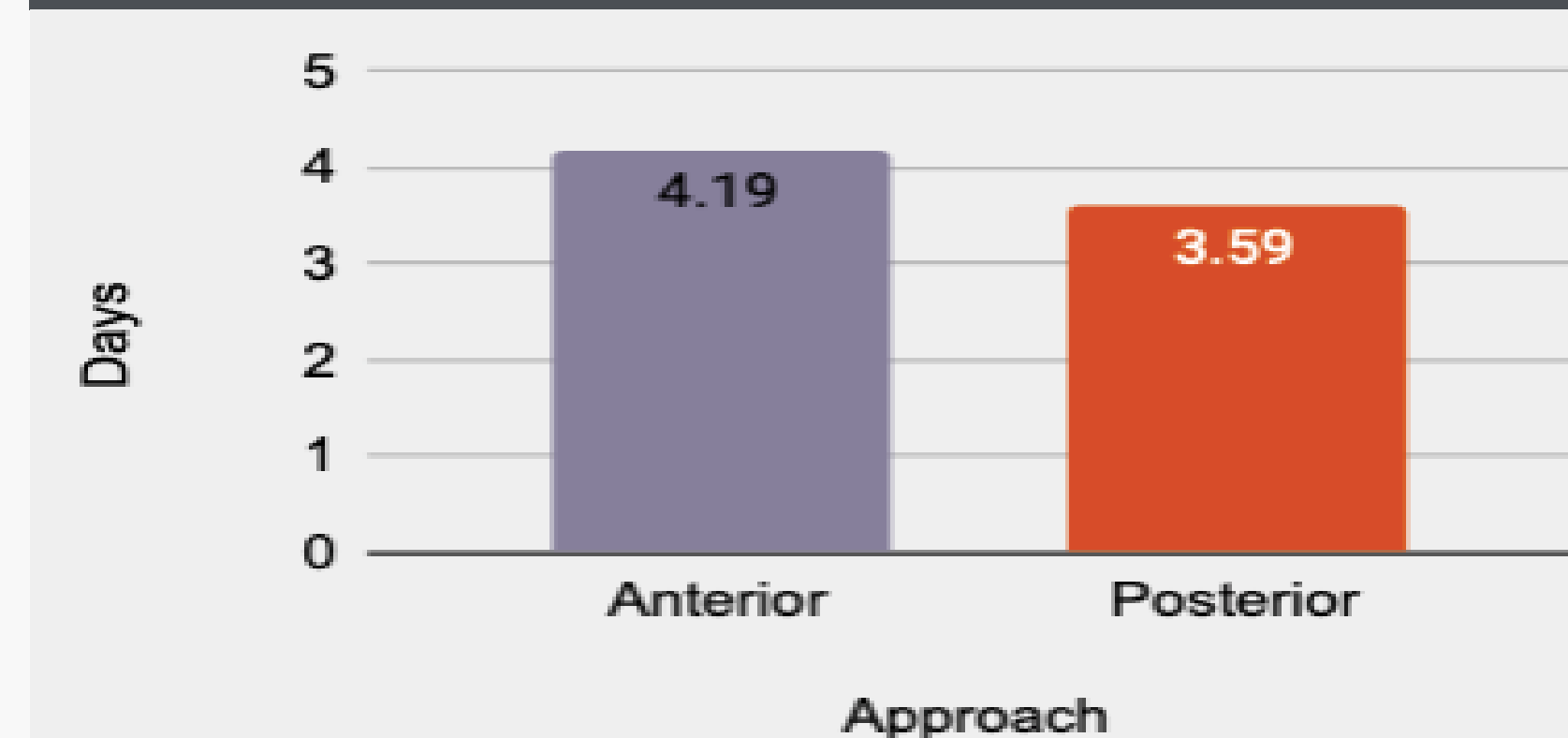


Figure 3. Average Total Charges

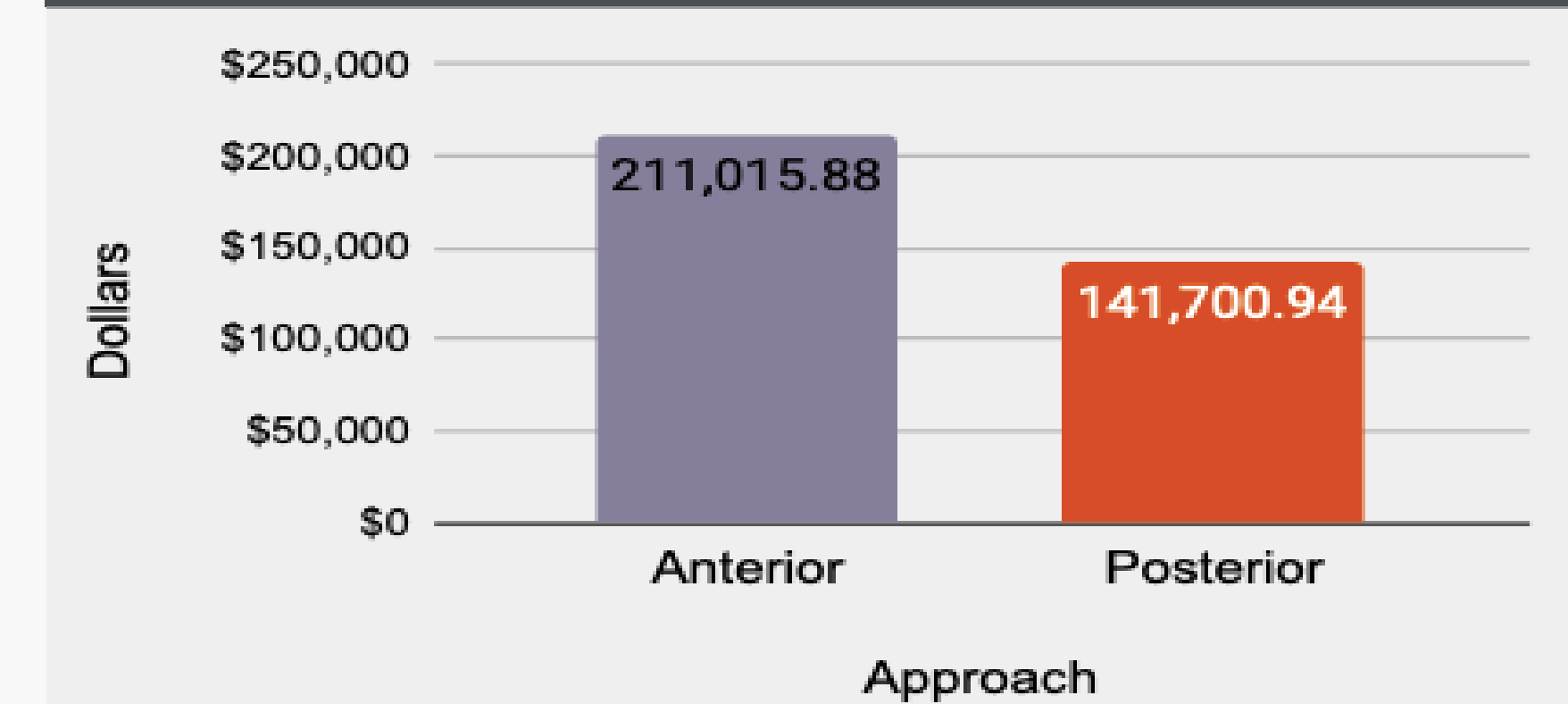


Figure 4. Average Age at Admission

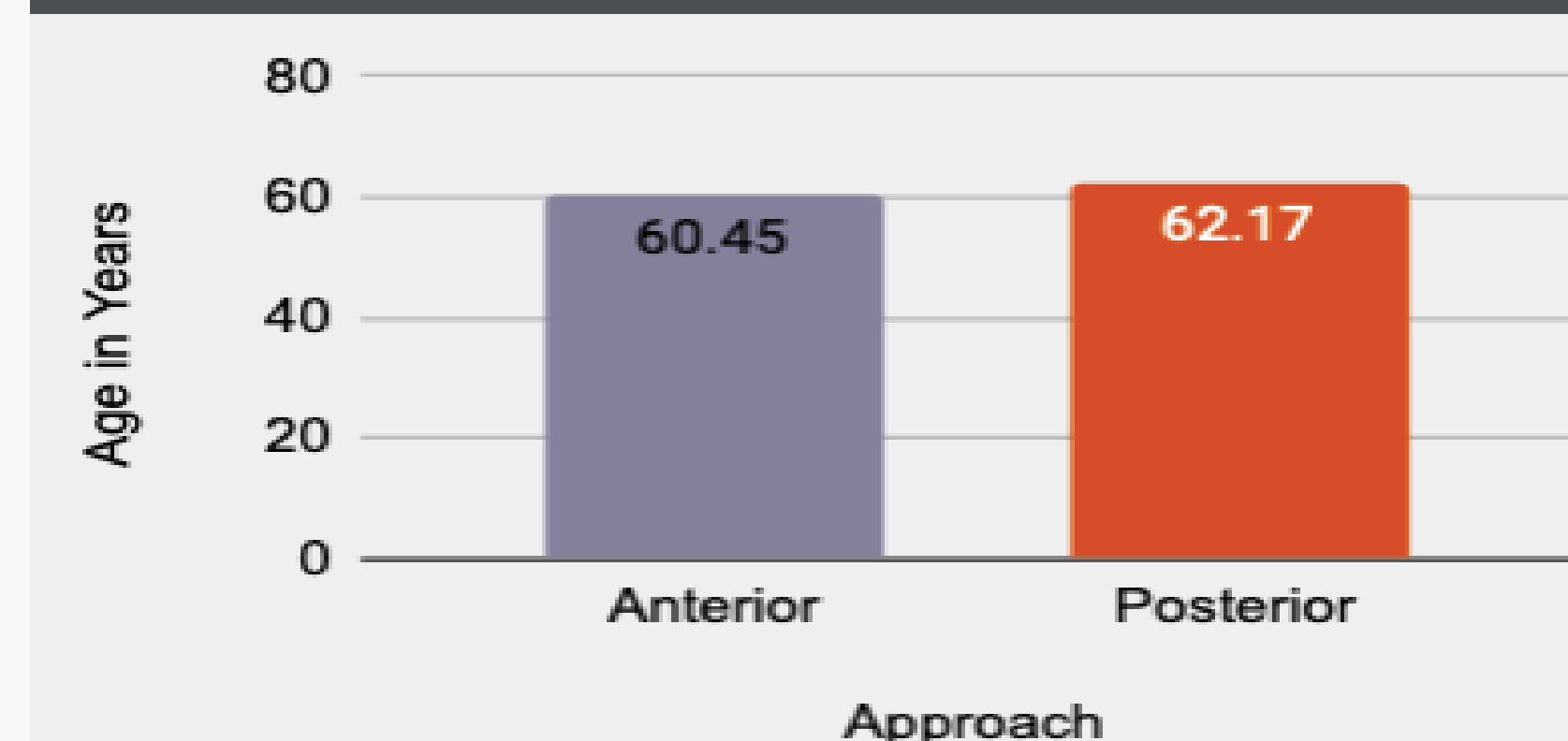


Figure 5. Percent of Post-surgical Pseudoarthrosis

