

Normal-Range Sodium Variability Is Not Associated With Skilled Nursing Facility Discharge After Total Hip and Knee Arthroplasty in Elderly Patients

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- BACKGROUND
- Skilled Nursing Facility (SNF) discharge after arthroplasty increases cost and delays recovery
 - Identifying predictors of non-home discharge is critical as arthroplasty volumes rise in older adults
 - Traditional sodium thresholds may overlook subtle physiologic variation
 - The clinical significance of normal-range sodium variability remains unclear
 - This study evaluated whether inpatient normal-range sodium variability predicts SNF discharge in elderly hip and knee arthroplasty patients

- METHODS
- Design:** Retrospective cohort using MIMIC-IV database
 - Population:** Age ≥ 65 undergoing hip or knee arthroplasty identified by ICD-10 codes
 - Exposure:** Serum sodium values during hospitalization were extracted, and sodium variability was defined as the difference between maximum and minimum values within the normal range (135–145 mEq/L).
 - Exclusion:** Patients with less than 2 sodium measurements
 - Primary Outcome:** Discharge disposition → SNF vs Home
 - Analysis:** Multivariable logistic regression adjusting for: age, postoperative hemoglobin, ICU admission, Length of Stay, and number of sodium measurements

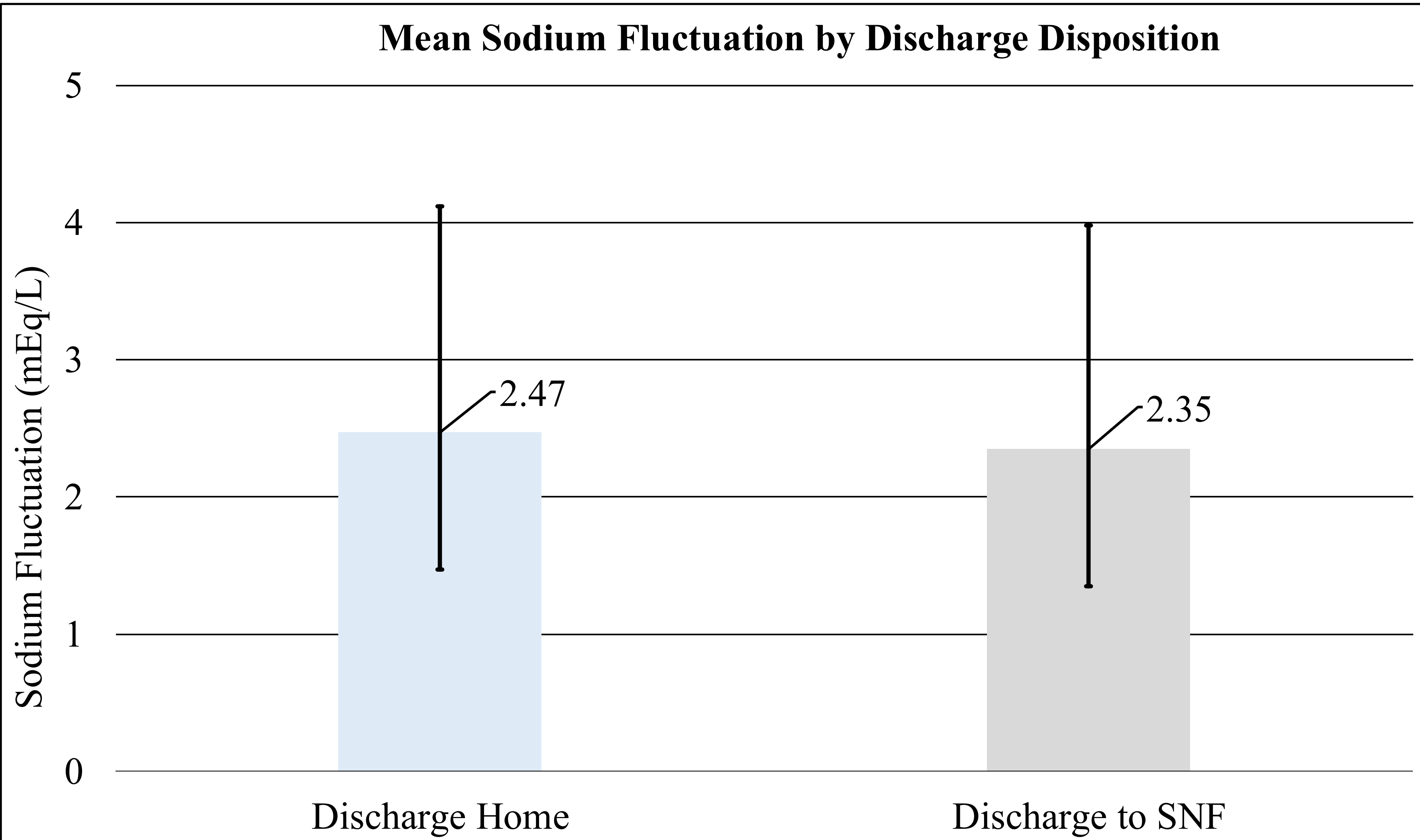


Figure 1. Mean Normal-Range Sodium Fluctuation by Discharge Disposition. Sodium fluctuation within the normal range did not differ between patients discharged home and those discharged to a skilled nursing facility (2.47 ± 1.65 vs 2.35 ± 1.63 mEq/L, p = 0.742). Error bars represent standard deviation.

Demographics	Discharge Home	Discharge to SNF	P value
Age (years)	72.21 ± 6.14	77.62 ± 7.75	<0.001
Female (%)	50.80	65.20	<0.001
Clinical Variables			
Normal range sodium fluctuation (mEq/L)	2.47 ± 1.65	2.35 ± 1.63	0.742
Lowest postoperative hemoglobin (g/dL)	8.85 ± 1.42	8.28 ± 1.42	<0.001
ICU stay (%)	3.10	9.80	0.005

Table 1. Patient Characteristics by Discharge Disposition. Patients discharged to a skilled nursing facility were older, more likely to be female, had lower hemoglobin levels, and higher rates of ICU utilization compared to those discharged home, while normal-range sodium fluctuation did not differ between groups. Values are presented as mean ± standard deviation or percentage.

- RESULTS
- Cohort:** 594 arthroplasty admissions
 - Primary finding:** Normal-range sodium variability did not differ between groups
Home: 2.47 ± 1.65 mEq/L
SNF: 2.35 ± 1.63 mEq/L
p = 0.742
 - Adjusted analysis:** Normal-range sodium variability not associated with SNF discharge
OR 1.02 (95% CI 0.92–1.12)
 - Factors associated with SNF discharge:**
Older age (77.6 vs 72.2 years, *p* < 0.001)
Lower postoperative hemoglobin (8.28 vs 8.85 g/dL, *p* < 0.001)
Higher ICU utilization and longer length of stay (*both p* < 0.05)

- CONCLUSION
- Normal-range sodium variability is not associated with discharge to a skilled nursing facility following total hip and knee arthroplasty in elderly patients**
 - Increasing age and lower postoperative hemoglobin independently predicted discharge disposition
 - Physiological reserve and perioperative recovery, rather than electrolyte variability within the normal range, drive post-acute care needs

- SIGNIFICANCE
- Subtle sodium fluctuations within the normal range are not clinically meaningful for discharge outcomes. Physiologic reserve, as reflected by age and hemoglobin, drives post-acute care needs.

