

# Incidence of Surgical Site Complications after Primary Total Hip or Knee Arthroplasty: A Comparison of Silver-containing Dressings with Single Use Negative Pressure Therapy in a Low-risk Group

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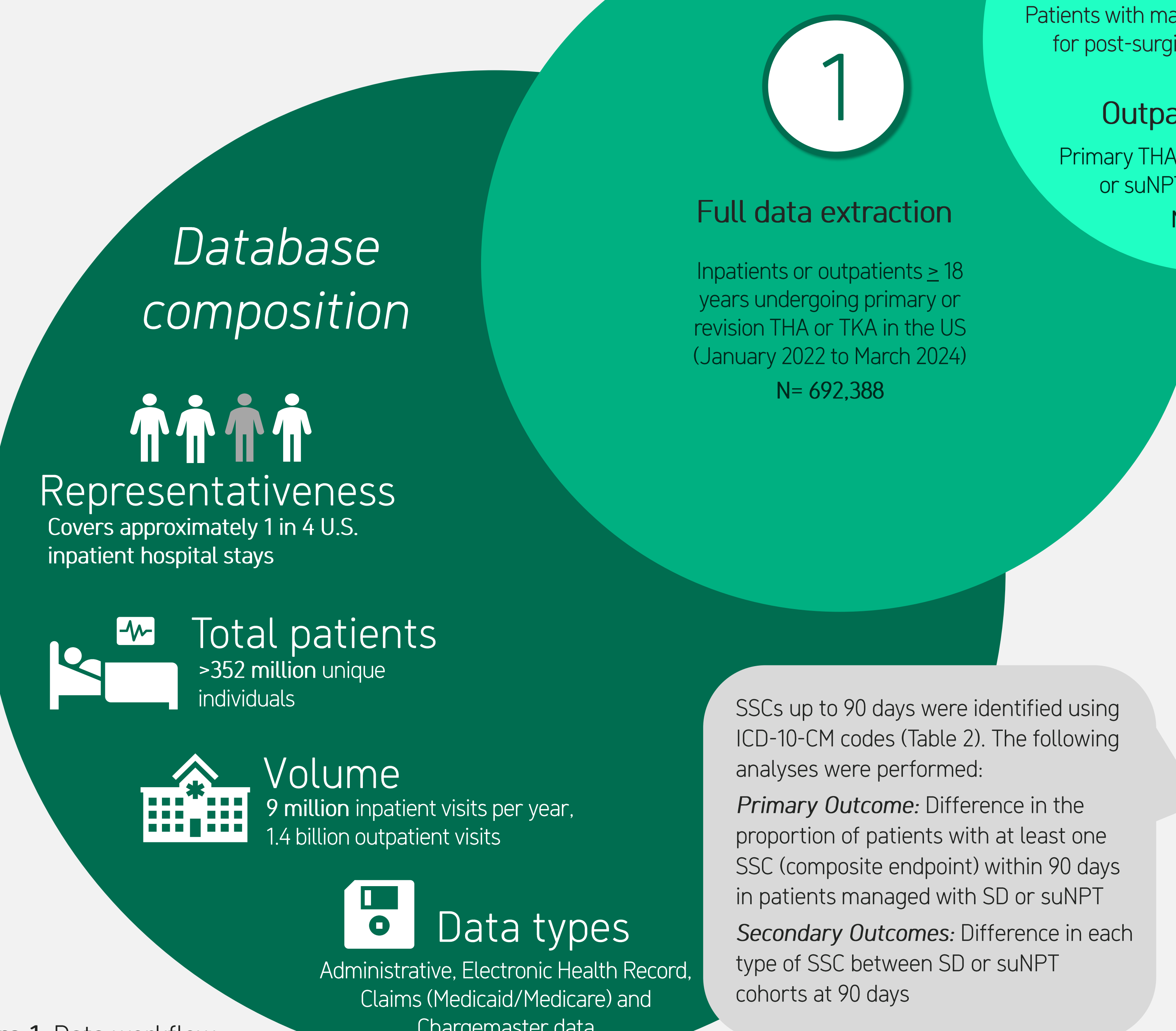
## BACKGROUND

- Preventing surgical site complications (SSCs) is important for high-volume orthopedic procedures such as total hip arthroplasty (THA) and total knee arthroplasty (TKA).<sup>1</sup> Surgical site infections (SSI) are a leading cause of THA/TKA failure.<sup>2,3</sup>
- The incidence of wound-related SSCs for patients undergoing primary THA and TKA is low (between 0.2% to 2.5%),<sup>2,3</sup> with higher rates in revision procedures and in cohorts with higher age and comorbidity burden.
- Negative pressure therapy (NPT) is often used to help prevent SSCs in patients with risk-factors for SSCs.<sup>4</sup>
- However, NPT is more complex, costly and burdensome compared to conventional dressings,<sup>5</sup> and whether its benefit extends to low-risk patients remains unclear.

## METHODS- REGISTRY STUDY DESIGN

Retrospective noninferiority analysis using the Premier Healthcare Database

- Large datasets are needed to determine the difference between rare outcomes with confidence.
- We used the Premier Healthcare Database for this purpose due to its size and representativeness.
- Two analysis cohort populations (Table 1) were generated using the workflow outlined in Figure 1. Propensity score matching (PSM) was used to generate the primary analysis cohort.



SSCs up to 90 days were identified using ICD-10-CM codes (Table 2). The following analyses were performed:

**Primary Outcome:** Difference in the proportion of patients with at least one SSC (composite endpoint) within 90 days in patients managed with SD or suNPT

**Secondary Outcomes:** Difference in each type of SSC between SD or suNPT cohorts at 90 days

## OBJECTIVES

We aimed to determine whether single use NPT (suNPT) had therapeutic benefit vs. traditional silver-containing dressings (SDs) in low-risk THA/TKA cohorts using a large registry-based analysis.

## PRIMARY ANALYSIS

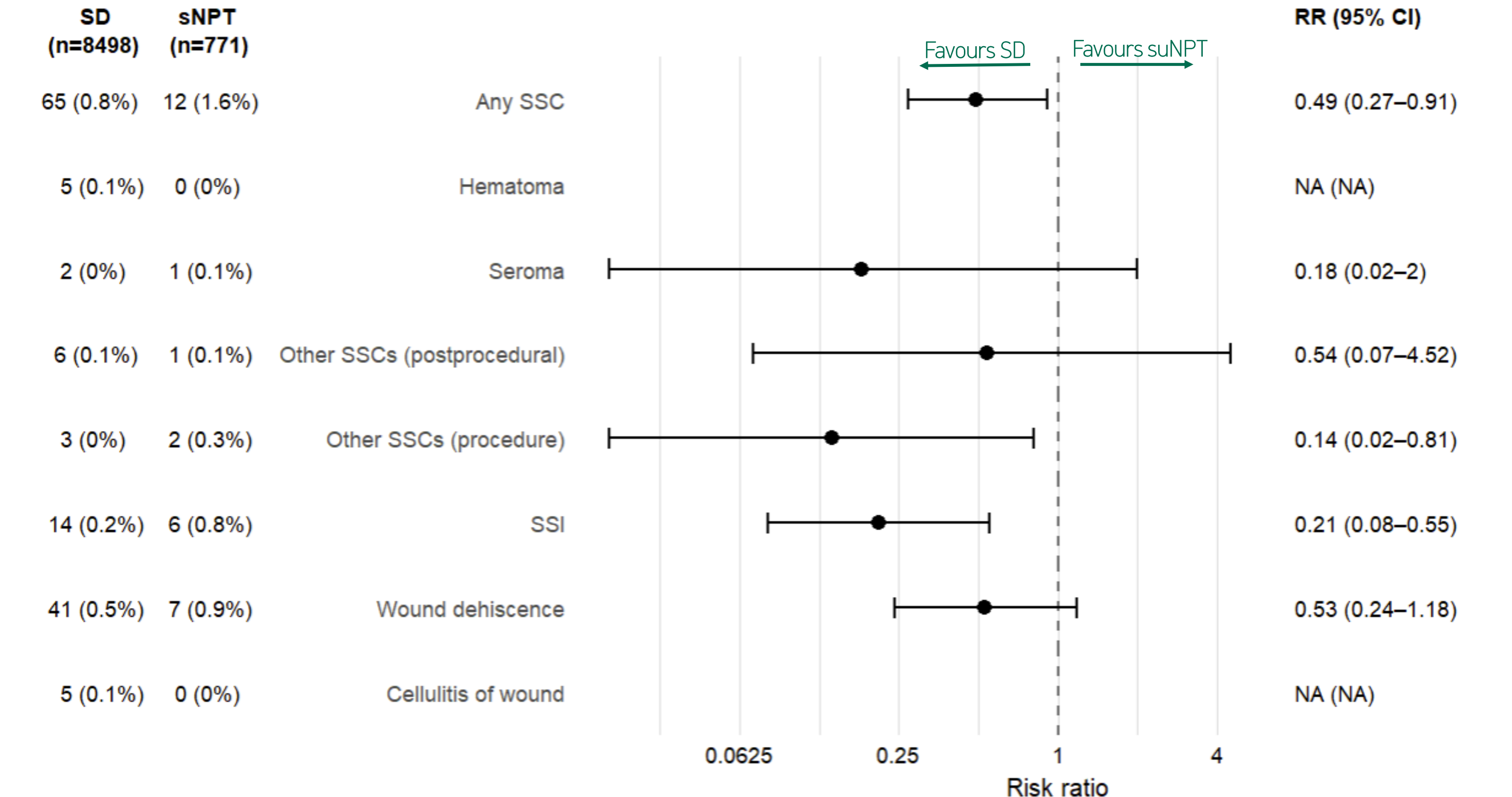


Figure 2: Risk ratio for any SSC (and by SSC) in the primary analysis cohort.

### Primary analysis

- In the SD group, 4 of the 921 patients (0.4%) experienced at least one SSC vs. 12 of 921 suNPT patients (1.3%), corresponding to a point difference of 0.9% in favor of SDs (p<0.01).
- The RR for SD vs. suNPT was 0.33 [95% CI 0.11 to 1.03] (Figure 2), suggesting a lower risk of SSCs in the SD group.
- The most frequent SSCs were wound dehiscence and SSI.
- Other procedural and post-procedural SSCs occurred infrequently (Figure 2). There was no (or only one) incidence of hematoma, seroma, and cellulitis among both groups such that RRs and ORs could not be calculated.

### Sensitivity analysis

- Among the 9,269 individuals in this age-adjusted cohort, 67 of the 8,498 patients in the SD group (0.8%) experienced at least one SSC vs. 12 of the 771 suNPT patients (1.6%), corresponding to a point difference of 0.8% in favor of SDs (p<0.001).
- This resulted in a RR for SD versus suNPT of 0.49 [95% CI 0.27 to 0.91], suggesting a lower risk of SSCs in the SD group.

Overall, results from both primary and sensitivity analyses suggest that SD is non-inferior to suNPT in low-risk TKA/THA.

## CONCLUSIONS

In this large registry-based study of low-risk THA and TKA outpatients, SSC incidence was lower among those managed with conventional silver dressings compared to suNPT.

These findings suggest that suNPT could reasonably be avoided in low-risk situations in favor of conventional dressings to reduce costs, complexity, and the overall burden of care.

- In our analysis of the Premier Healthcare Database, we found rates of complications post-THA and -TKA comparable to those reported for low-risk cohorts in the literature.<sup>1,6</sup>
- SSC incidence was lower in the SD group vs. the suNPT group (p<0.01).
- The same conclusion was reached in our sensitivity analysis, using a much larger, unmatched population which accounted for age (a key SSC risk factor).
- These findings align with a meta-analysis reporting a non-significant relative reduction in SSC risk with suNPT versus conventional dressings among a similar patient cohort.<sup>7</sup>
- Additional studies should be conducted on a broader range of SD and suNPT devices to ensure these results are reproducible in diverse clinical settings.

Table 1: Select demographics of the two analysis cohorts

	Primary Analysis (n=1,842)		Sensitivity Analysis (N=9,269)	
	SD (N = 921)	suNPT (N = 921)	SD (N = 8,498)	suNPT (N = 771)
Type of Surgery, n (%)				
THA	557 (60.5%)	557 (60.5%)	3,276 (38.6%)	472 (61.2%)
TKA	364 (39.5%)	364 (39.5%)	5,222 (61.4%)	299 (38.8%)
Gender, n (%)				
Female	557 (60.5%)	556 (60.4%)	4,905 (57.7%)	453 (58.8%)
Male	364 (39.5%)	365 (39.6%)	3,593 (42.3%)	318 (41.2%)
Age, mean (SD), median [range]	65.8 (9.5), 66.0 [26.0, 89.0]	65.8 (9.6), 66.0 [25.0, 89.0]	64.0 (8.8), 65.0 [22.0, 79.0]	63.1 (8.5), 64.0 [25.0, 79.0]
Facility location, n (%)				
Rural	123 (13.4%)	20 (2.2%)	1,287 (15.1%)	13 (1.7%)
Urban	798 (86.6%)	901 (97.8%)	7,211 (84.9%)	758 (98.3%)

Table 2: ICD-10-CM codes used to identify SSCs from patient records in both analysis cohorts

SSC	ICD-10-CM Code	ICD Description
SSI	T81.4X	Infection following a procedure
Wound dehiscence	T81.3X	Disruption of wound
Hematoma	L76.32	Postprocedural hematoma of skin and subcutaneous tissue
Seroma	L76.34	Postprocedural seroma of skin and subcutaneous tissue
Cellulitis of wound	L03.90	Cellulitis, unspecified
Other SSCs/complications of procedure	T81.89	Other complications of procedures, not elsewhere classified
Other SSCs/ post-procedural complications	L76.82	Other postprocedural complications of skin/subcutaneous tissue

Figure 1: Data workflow.