

Decreasing Intraoperative Costs by Optimizing Instrument Use

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ABSTRACT

Educational Objective: Empower budding and established otolaryngologists to evaluate opportunities for decreased intraoperative waste while maintaining excellent patient care standards.

Objectives: Efficient, high-quality, cost-effective patient care is a major objective for Stanford Healthcare. Variability in disposable item use has a major impact on the cost of surgical procedures. The goal of this study was to use Stanford's internal data analytics platform to identify cost-savings measures in OHNS cases and drive change toward cost-effective practices.

Study Design: Comparative analysis of intraoperative usage and waste within single institution Otolaryngology Department

Methods: Using the Supply Chain Variation Software, the top 100 Otolaryngology cases were analyzed across different surgeons. Patterns of use were identified and categorized. Unused and wasted items were identified. Outlier items which were far costlier than comparison items were identified and discussed with the surgeon of record.

Results: Significant variation of disposable use items across similar surgeries was identified without a known clinical advantage. Additionally, many items were identified as wasted or unused despite being present on a surgeon's case card.

Conclusions: Within the surgical specialties, there is a growing body of literature assessing operating room expenses and the impact on patient care, physician satisfaction, and overall hospital expenditures. Decreasing intraoperative costs by reducing unused instruments and surgeon variability has potential for significant annual cost savings.

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BACKGROUND

Given the soaring costs of healthcare, all medical specialties within Stanford Hospital aim to decrease operating costs while optimizing efficiency and patient care. Within the operating room, there are significant differences in direct variable costs based on unique surgeon preferences. Surgical case-card preferences vary substantially from surgeon to surgeon with little or no oversight. Indeed, most surgeons are not even aware of the significant variability that exists for commonly performed surgical cases or the costs associated with this variability. Our objective is to understand and reduce the cost variability of disposable items between surgeons for common otolaryngology cases.

MATERIALS AND METHODS

Using the Stanford Supply Chain Variation software, the most frequent 100 otolaryngology cases were analyzed across different surgeons. Patterns of use were identified and categorized. Unused and wasted items were identified. Outlier items or surgeon practices which were far costlier than comparison items were identified.

Focus of the analysis included intersurgeon variability, items that were picked for a case but went unused, and items that were added on which were not originally present on the case card.

We first identified high volume procedures, defined as over 50 cases recorded in our database. We next identified various opportunities for savings and refined our recommendations based on surgeon feedback.

The limitations of the study included inherent constraints of the Supply Chain Variation Software including inability to categorize multi-procedure cases (i.e. resection of primary + neck dissection) as well as difficult distinguishing discarding vs. restocking of unused items.

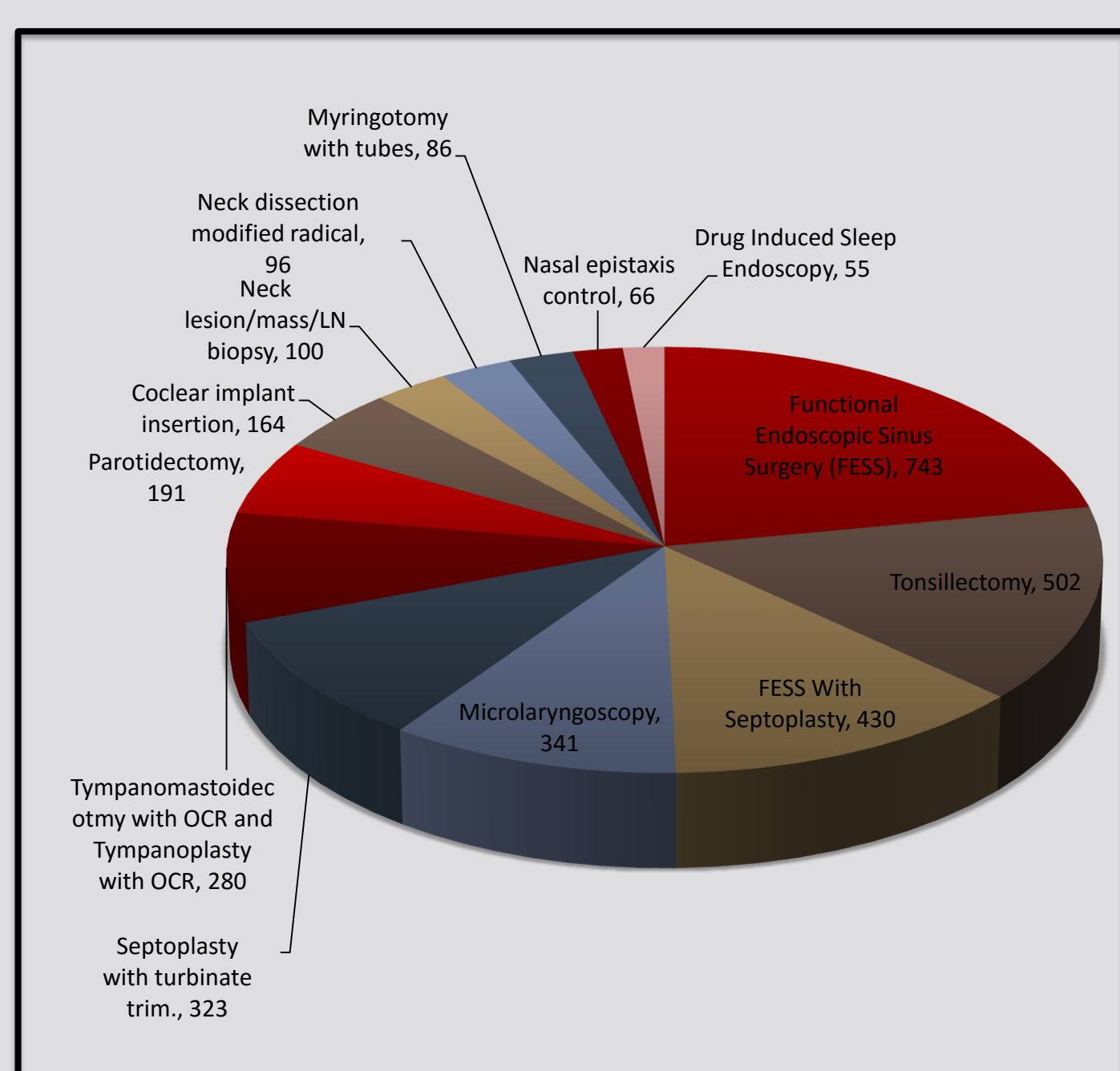


Figure 1. Breakdown of Top 12 Case Types by Number of Cases Performed
*Not all cases entered due to database inability to categorize multi-procedure cases (i.e. resection of primary tumor + neck dissection)

RESULTS

Analysis of Unused Items: The top five Otolaryngology case types based on number of cases captured in the database were identified. The most frequent cases included: Functional Endoscopic Sinus Surgery (FESS), Tonsillectomy, FESS with septoplasty, microlaryngoscopy, septoplasty with turbinate trim. A total of 2,339 cases (37% of the total recorded otolaryngology cases) were analyzed. Items that were picked from the case card, but went unused were analyzed. These items were further broken down based on cost and frequency of times picked but unused.

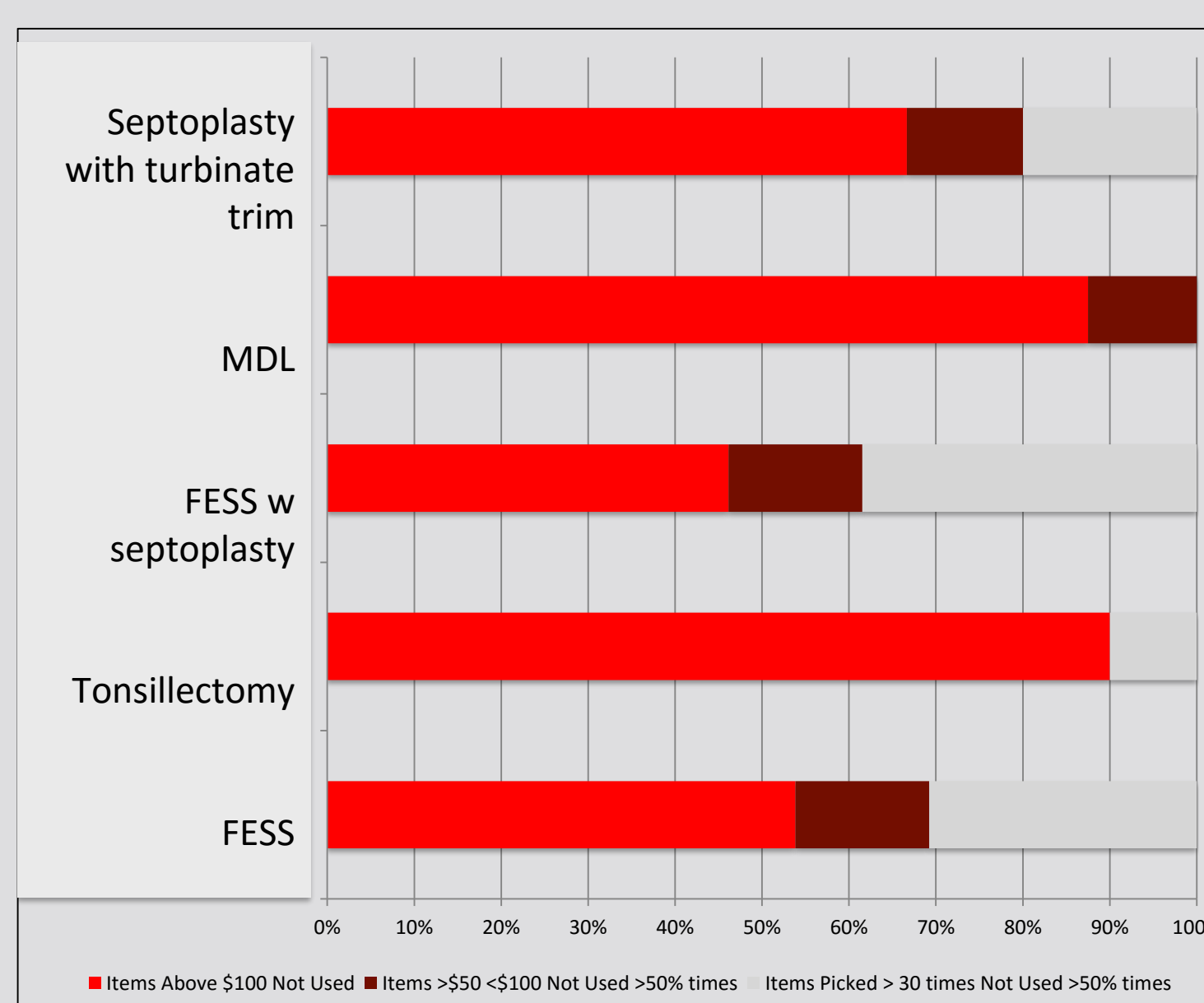


Figure 2. Most frequent 5 cases performed and breakdown of unused items based on cost of item and percent of time wasted.

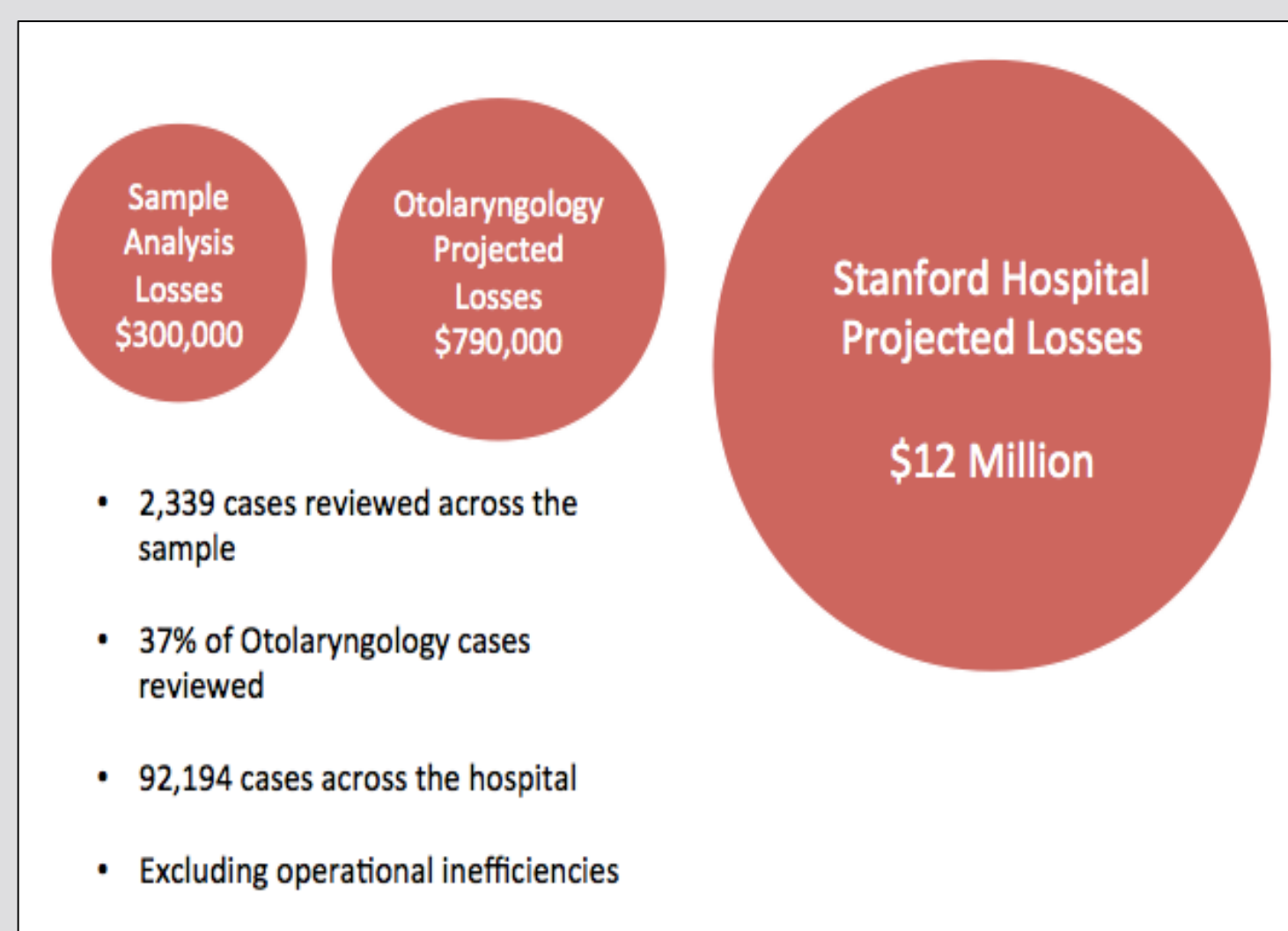


Figure 3. Projected Hospital-Wide cost savings based on wasted items of the top 5 otolaryngology cases

Analysis of Add-on Items: The cost-savings of add-on items (items that were not originally on the case card, but were added at some point during the surgery) were also analyzed to determine if case cards needed to be expanded to avoid OR inefficiency, time waste, and thus indirect costs. The most-frequent add-on items were gloves, IV fluids, medications, blades, syringes, and sutures. These were low-cost items that often exist within the operating room. It was thus determined that Add-On items were not a significant cost driver for Stanford.

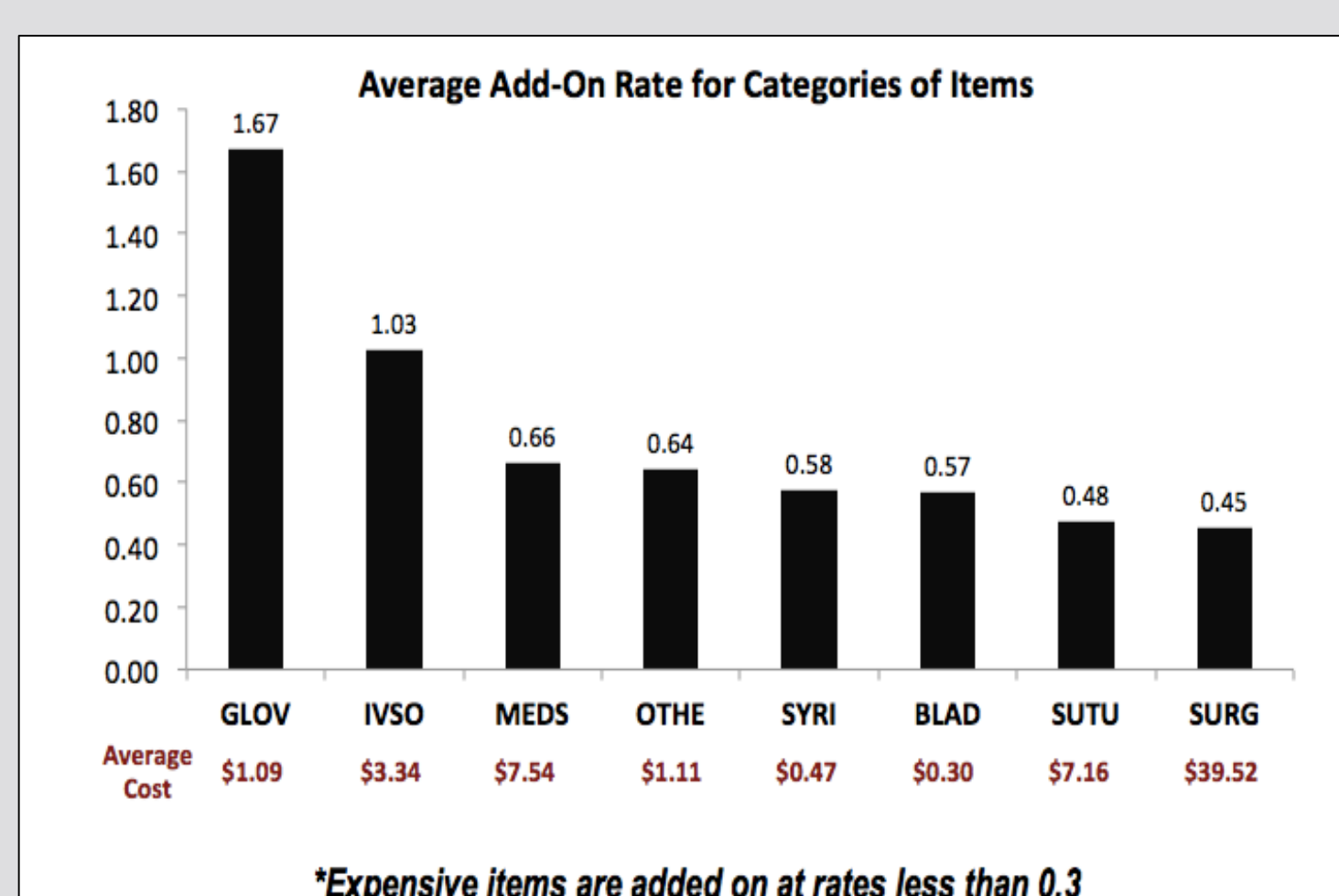


Figure 4. Most frequent add-on items and their associated costs

Analysis of InterSurgeon Variability: Costs were compared between surgeons performing the same procedure. These costs were compared with special attention paid to different use of disposable items. This cost analysis did not account for the costs associated with total time of surgery. Additionally, we did not incorporate post-surgical outcomes into this analysis.

We found that significant cost/case variability existed between Stanford Otolaryngologists. There was >2x variability across 4 procedures and \$200K in savings was identified across 11 procedures with FESS representing the highest cost-savings potential.

We also found that item use and cost trends for individual surgeons translated across procedures. Linear regression analysis also found that surgeons with the highest case loads tend to have the lowest operating costs.

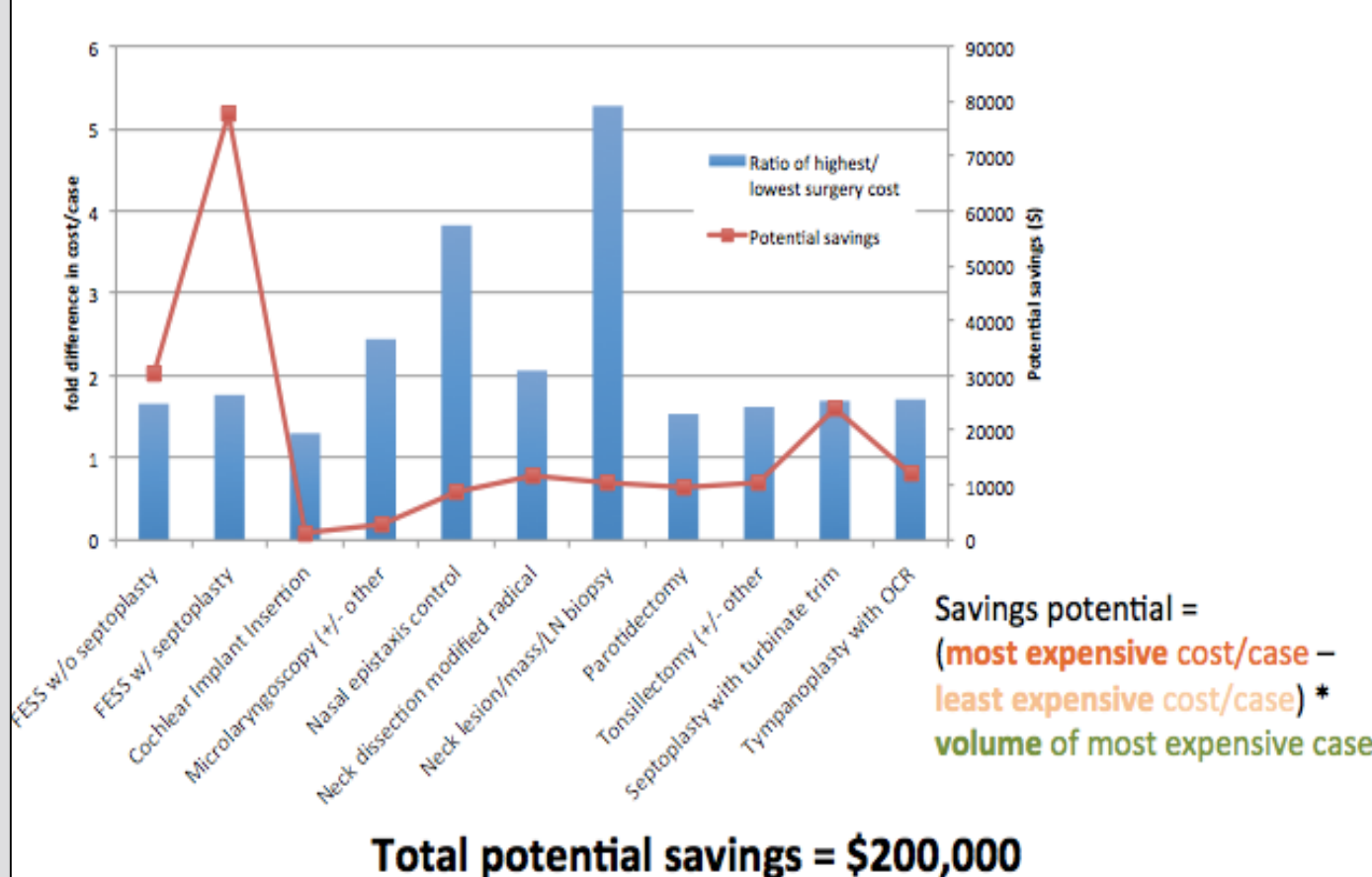


Figure 6. Intersurgeon Variability and Cost Savings Opportunities Across Procedures

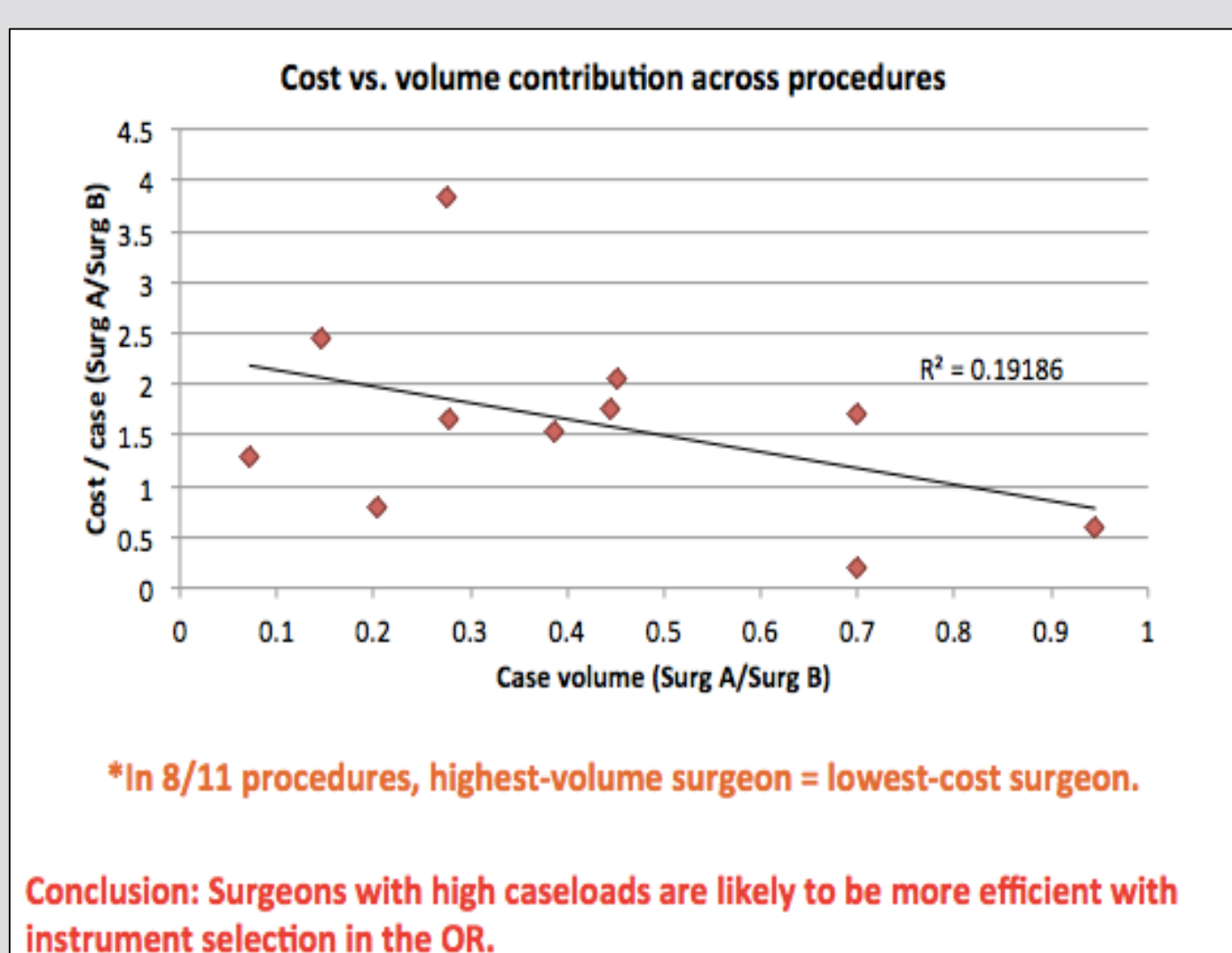


Figure 7. Surgeon intraop cost as it relates to surgeon case volume

CONCLUSIONS

Within the Stanford Otolaryngology Department, wasted items (~790K) and Intersurgeon Variability (~\$200K) have the highest potential for costs savings. In using the database, several points of improvement recommendations were also made including the ability to track true item waste, improving case capture, and improving surgeon accessibility and usability of the system.

Additionally, it was recommended that further cross-talk between surgeon use so that surgeons could better understand their cost and use patterns as compared to their colleagues.