Innovative Techniques to Evaluate Healthcare Delivery Strategies to Reduce Wait Times in Orthopaedic Foot Care

Gurjovan Sahi¹, Aazad Abbas, Jay Toor², Sam Si-Hyeong Park² ¹Faculty of Medicine, ²University of Toronto

INTRODUCTION:

Orthopaedic forefoot conditions such as bunion deformities, claw toes, and arthritis of the foot are often overlooked by our healthcare system. There is often a misconception that forefoot conditions are primarily a cosmetic issue for patients. However, forefoot pathologies have a significantly negative effect on health-related quality of life and lead to pain, disability, and limited function. An arthritic first metatarsophalangeal (MTP) joint has been shown to be as disabling as an arthritic hip or knee. In addition, forefoot pathologies have a relatively high prevalence in the general population, with numerous studies showing females are disproportionately affected.

Access to care with orthopaedic foot and ankle (FA) specialists is concerningly difficult, leading to some of the highest wait times amongst all orthopaedic procedures. Some patients wait up to eight years or more to be seen. This is unfortunate as many foot and ankle procedures, including forefoot surgeries, are amenable to cost containment strategies as they can be performed via outpatient day surgery, carrying a much lower episodic cost of care. Forefoot surgeries have also been proven to be relatively inexpensive relative to substantial gains in health and are comparable to total joint replacement.

To help address the significant wait times and the backlog of cases, many hospitals have implemented different wait time reduction strategies (WTRS). Popular WTRS include expansion of virtual care, extended hours, and implementation of volume funding remuneration. The primary objective of this study is to determine which WTRS can most effectively address the wait times for FA surgery. The secondary objective will look at the cost-effectiveness of these WTRS. METHODS:

The workflow of an outpatient hospital in Canada was modeled retrospectively from 2016-2022 to assess the efficacy of the aforementioned WTRS. Data sources included hospital decision support, accounting, Ministry of Health wait times, and literature values. To accurately reconstruct the workflow, a discrete event simulation (DES) model was constructed. The DES structure was based on process mapping stemming from a combination of observing workflow, reviewing OR and clinic schedules, and expert opinion from clinicians and hospital management. The three WRTS models that were run included 1) virtual clinics, 2) extended surgical hours and 3) bundled payments model. The outcome metrics included: 1) throughput for clinic/ORs (number of patients seen/cases completed), 2) wait time reductions, and 3) financial impact.

RESULTS: For the virtual clinic models, running a range of half to one day of additional virtual clinics reduced wait times by 40.2-58.9%. Ranging the proportion of clinics being virtually from 10% to 90% results in a decrease in wait times by 2.7%-25.9%. For extended surgical hours, running the model for a period of 200 OR days a year resulted in 719 cases completed (profit = \$518,149.92). Adding one to three additional hours resulted in 816 to 1015 cases done, a 13.5 to 41.2% increase in throughout and \$18,828.78 to \$76,497.63 increase in profit. For the bundled payments model, the average profit per case without bundled payments was \$660.78. Incorporating a bundled pay remuneration model of \$1000-\$8000 per case resulted in a profit of \$-988.55 to \$6011.45, with cases being profitable at remuneration of >\$2000/case.

DISCUSSION AND CONCLUSION: This study demonstrates that wait time reduction strategies such as virtual clinics, extended surgical hours and bundled payment models have the potential to reduce wait times to clinics and ORs. increase surgical throughput and are financially more viable. Moreover, demonstrating this at an outpatient center has broad implications in the North American healthcare context as it allows for an efficient and cost effective solution to the current surgical backlogs. Future work should aim to prospectively analyze how these dedicated outpatient centers may improve patient care, decrease surgical wait times and reduce healthcare costs.

