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## Hospital / Ambulatory Surgical Center Cost Savings: Total Knee Arthroplasty Instrument Specific Tray Reduction

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### Quick Facts

- The *Quick Recovery Solutions* system (QRS™ Maxx Orthopedics, Norristown, PA) focuses on the reduction of various burdens across the entire delivery of primary TKA.
- Of all opened instruments, only 20% are used in most TKA surgical procedures.
- Average total processing cost of a single instrument is approximately \$0.51.<sup>3</sup>
- Reduction of non-used TKA instruments is an opportunity for cost optimization.
- The Freedom QRS Quick Tray System instrument specific tray reduction yielded an estimated 61% to 69% processing cost savings.

### INTRODUCTION

The cost-effectiveness of all aspects of surgical procedures is being closely scrutinized in our current value-based healthcare environment.<sup>1-4</sup> This commonly includes the assessment of operating room (OR) efficiency measured in time reduction against overall OR unit cost versus patient outcome. Especially in primary total hip and knee arthroplasty procedures, these marginal gains are measured for procedures, surgeon technical skills and support staff that are already highly optimized. However, amid the ongoing economic pressures as a result of the post-COVID-19 re-integration processes are also target burden reduction across the delivery of care.

The purpose of this report is to introduce the Maxx *Quick Recovery Solutions* (QRS™) system for primary total knee arthroplasty (TKA) inter-operative instrument tray reduction, and to report on the influence of the QRS tray implementation on surgical efficiency and related facility cost reductions.

### QRS PROGRAM

When applied to TKA instrument specific tray reduction to a single instrument tray, the Maxx QRS system was re-structured to achieve the following;

- CUSTOMIZE:** Implement the use of a single instrument tray based on pre-operative planning and surgeon preferences.
- OPTIMIZE:** Cost effective intra-operative use with faster central processing turn-around due to identification and reduction of unnecessary instruments.
- ACCELERATE:** Reduction of OR total case set-up, procedure and tear-down burden thus facilitating greater patient throughput.

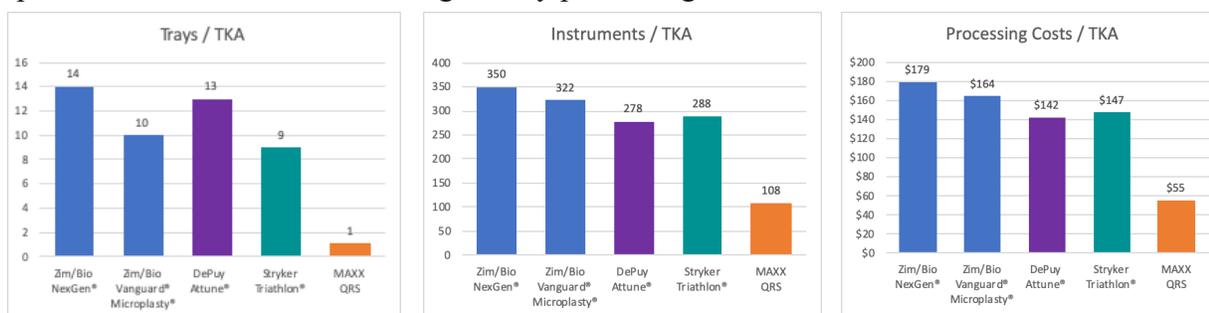
### DISCUSSION

Assuring that the correct surgical instruments are delivered to the operating room on-time, sterilized and in working order is of paramount importance for the performance of the surgical procedure. Chronically overstocking instrument trays for surgery is a common practice and is

historically done to avoid missing instruments during a procedure. However, the inability, or avoidance, of predicting what is really needed may be the true reason for the excessive overstocking of surgical instruments. The chronically excessive use of unnecessary and unused instrument trays adds costs including transportation, handling, set-up, tear-down, processing and storage.

Independent of the surgery type, instrument tray optimization has become a focus of cost-reduction strategies for hospitals, and ambulatory surgery centers (ASC).<sup>1-4</sup> It has been shown that the total cost to process a single instrument is approximately \$0.51 and may increase based on complexity of the instrument/specialty.<sup>3</sup> In addition, Stockert, *et al*, has shown that across four surgical specialties, less than 20% of the total instruments opened are actually used during the procedure.<sup>4</sup>

As displayed below, there may be up to 14 TKA specific trays available for a single procedure leading to significant costs in OR burden, intra-operative use and post-operative processing. The first arm of the Maxx QRS was developed to address TKA specific instrument tray optimization, decrease in operating room burden and facility cost reductions. This also includes the Maxx QRS Sizer technology. Assessing instrument use related to pre-operative templating and component sizing revealed an opportunity to minimize the related TKA instrumentation, yielding efficient operative utilization and decreasing facility processing costs.



## CONCLUSION

Cost reductions across the continuum of care for TKA is a continuous effort for all participants. Implementing cost efficiency without reducing outcome is a continuous moving target. The Maxx QRS system has initially addressed TKA specific tray reduction through "template-directed"<sup>2</sup> component sizing and instrumentation optimization. Comparative results have shown significant processing cost reductions for the Maxx QRS tray processing cost reduction (61% to 69%) when compared to various competitive standard TKA specific instrument tray utilization. Further application is warranted to study the impact on operative room efficiencies including room set-up, turn-over, and the cost per square footage of storage.

## REFERENCES

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