

# ExactechGPS Guidance System Shown to Not Increase Operative Time When Compared to Conventionally Instrumented Total Knee Arthroplasty

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## INTRODUCTION

Success in total knee arthroplasty (TKA) depends on many factors. Although TKA is a very common procedure, approximately one in five primary TKA patients were not satisfied with the outcome following their surgery.<sup>1</sup> Traditional computer assisted orthopedic surgery (CAOS) has been shown to increase accuracy and improve clinical outcomes in TKA.<sup>2</sup> One of the main perceived drawbacks to traditional CAOS relates to an increased operating time when compared to a conventional TKA technique using standard mechanical instrumentation.

This study, led by Pasquale Petrera, MD, compared operating times, from incision to dressing, for TKA using conventional instruments to TKA associated with different levels of experience using a novel CAOS guidance system (ExactechGPS, Blue-Ortho, Grenoble, FR).

## METHODS

This retrospective review compares operating times associated with three groups of 21 patients each. Conventional mechanical instrumentation was used for Group I (i.e., the control group). Group II represented early experiences using the CAOS guidance system (i.e., navigated cases #1 to 21) and Group III represented advanced experiences using the CAOS guidance system (i.e., navigated cases #75 to #96). All TKAs were performed by the senior author using spinal anesthesia with tourniquet. No cases were excluded. All TKA procedures were performed using the same TKA system (Optetrak Logic PS, Exactech, Gainesville, Fla.).

## RESULTS

Compared to the conventional mechanical instrumentation, the differences in average operating times were an increase of seven minutes for the early CAOS guidance system experiences and a decrease of two minutes for the advanced CAOS guidance system experiences (see Table I). Also, it was observed that the advanced CAOS guidance system experiences were associated with the lowest standard deviation among the three groups. None of these differences were significant.

Table I: Operating times among the three groups of patients

Group	I	II	III
Average operating time (minutes)	99	106	97
P-value (Compared to Group I)	N/A.	0.201	0.690
Range (minutes)	79–134	71–144	79–131
Standard deviation (minutes)	15.2	17.7	13.9

## DISCUSSION

It should be expected that introducing any new equipment or technology into the operating room may have an impact on the total operating time. This accounts for the learning curve of both the OR staff becoming familiar with setting up and preparing instrumentation, as well as the learning curve the surgeon will experience initially while conducting the surgery. This being said, the results of this study demonstrated that once an initial learning curve is reached, usage of the ExactechGPS does not increase operative time compared to conventional mechanical instrumentation for TKA procedure; which departs from the conclusion of previously published literature.<sup>3</sup> It should be mentioned that even the first cases associated with the evaluated CAOS guidance system were associated with a small increase of the operating time, which is remarkable considering that the few initial cases were associated with training of the OR members.

Compared to other CAOS technologies, ExactechGPS' surgeon profiler allows surgeons to create a fully-customizable workflow based on their preferences and patient indications. ExactechGPS' hardware technology is represented by a unique display unit featuring a touch screen and built-in proprietary optical camera. During surgery, the display unit is advantageously located on the contralateral side of the patient and draped inside the sterile field.

## CONCLUSIONS

Following the initial learning curve, the average operating time for the TKA procedures performed using ExactechGPS proved to be equivalent to conventionally instrumented TKA procedures. ExactechGPS represents a unique package combining the accuracy of standard navigation systems<sup>4</sup> with personalization options in a user-friendly environment, helping achieve efficacy and efficiency in the intense environment of the operating room.

## REFERENCES

1. **Bourne RB, Chesworth BM, Davis AM, Mahomed NM, Charron KD.** Patient satisfaction after total knee arthroplasty: who is satisfied and who is not? *Clin Orthop Relat Res.* 2010 Jan; 468(1) 57-63.
2. **Rebal BA, et al.** Imageless Computer Navigation in Total Knee Arthroplasty Provides Superior Short Term Functional Outcomes: A Meta-Analysis, *J Arthroplasty* (2013), <http://dx.doi.org/10.1016/j.arth.2013.09.018>
3. **Stiehl, Koner, Haaker, DiGioia.** Navigation and MIS in Orthopedic Surgery. 2006. Chapter 73 (603-611).
4. Data on file at Exactech. Accuracy of a Novel Computer-assisted Guidance System for Total Knee Arthroplasty.