Specific Factors Affecting Operating Room Efficiency: A Systems Analysis of Case Time Estimates
Madeline Rocks, Devon J Ryan, Karen Jiwon Noh, Heero Hacquebord
1Apt Leadership

INTRODUCTION: Operating room efficiency has an impact on both surgeon productivity and patient experience. Accurate case time estimates will lead to improved staffing and resource allocation. The purpose of this study is to identify factors associated with inaccurate case time estimates in an outpatient hand surgery practice through the usage of established systems analysis tools from industry. A better understanding of these findings can help to improve operating room efficiency and scheduling.

METHODS: All outpatient hand surgical cases from 2018-2019 were examined. P-values at p<0.05 were considered statistically significant when using student’s t-test for comparing well and poorly estimated cases. Scheduled versus actual case time was analyzed by location, predicted case length, procedure type, surgeon, and time of day. To investigate variability and identify outliers based on these categories, Difference Recognition (DR) control charts from one analysis software system were utilized. Number of cases that remained within (or were less than) the scheduled time and number of cases that exceeded the scheduled time, were calculated and graphed.

RESULTS: A total of 7,203 cases were analyzed. Statistically significant comparisons were found between well and poorly estimated cases [Table 1]. Meaningful differences in the accurate estimation of cases existed between the three facilities studied. Cases scheduled for 31-45 minutes are quicker than planned. Cases scheduled for 15-30 minutes or 76-90 minutes are slower than planned. Cases 46-75 minutes are within predicted variability. Procedures involving a nerve release, trigger finger release, mass excision, or DeQuervain’s release tend to be faster than planned. Wrist fractures, arthroscopies, arthroplasties, arthrodeses, or bone removal procedures tend to take longer than planned [Figure 1a]. Surgeons C, D, N, and S tend to take less time than planned while surgeons A, B, F, K, L, Q, T, and U tend to take more time than planned [Figure 1b]. Faster than planned surgeons perform more low complexity cases compared to on time surgeons while slower than planned surgeons perform more highly complex cases. A similar number of cases took longer than planned independent of whether the case was the first of the day or not (43% first case, 45% not first case).

DISCUSSION AND CONCLUSION: The accuracy of case time estimations in a standard outpatient hand surgery practice is highly variable. Inaccurate case time estimation can be reliably predicted based on procedure type and surgeon. Our analysis clearly identifies areas where estimation must be changed to allow for more accurate scheduling.