Surgeons’ Efficiency and Surgical Resource Utilization in the Operating Rooms.

Yoshinori Nakata MD MBA1,2,3, Yuichi Watanabe MS MPH2, Hiroto Narimatsu MD PhD4, Tatsuya Yoshimura MD5, Hiroshi Otake MD MBA6, Tomohiro Sawa MD PhD3
1Teikyo University Hospital; 2Teikyo University Graduate School of Public Health; 3Teikyo University Medical Information & System Research Center; 4Kanagawa Cancer Center Research Institute; 5Shin-Yurigaoka General Hospital; 6Showa University School of Medicine, Japan

Background & Goal of Study
We reported two studies that evaluated the Japanese surgical reimbursement system in terms of resource utilization using surgeons’ efficiency scores measured by data envelopment analysis (DEA).1, 2 We demonstrated that the Japanese surgical reimbursement system failed to reflect resource utilization and is unequal among surgical specialties in 2013 and 2014. This observation was based on the previous fee schedules before the revision in 2016. The purpose of this study is to examine whether the current surgical reimbursement system in Japan reflects resource utilization after the revision in 2016.

Materials & Methods
The Teikyo University IRB approved our study. We collected data from surgical records in the Teikyo University electronic medical record system from April 1 till September 30, 2016. We employed output-oriented Charnes-Cooper-Rhodes model of DEA. We defined the decision making unit as a surgeon with the highest academic rank that scrubbed in the surgery. We focused on the surgeons’ activity and their clinical decision. The inputs were defined as (1) the number of medical doctors who assisted surgery, and (2) the time of operation from skin incision to skin closure. The output was defined as the charged surgical fee for each surgery. We added all the inputs and outputs of the surgical procedures for each surgeon during the study period, and calculated his/her efficiency score using DEA. All the surgeons analyzed belong to one of the following ten surgical specialty departments. We compared the efficiency scores of each surgical specialty using Kruskal-Wallis and Steel methods.

Results & Discussion
We analyzed 2,558 surgical procedures performed by 109 surgeons during the study period. The efficiency scores of each surgical specialty were shown in Figure 1. The difference in efficiency scores was statistically significant (p = 0.0001). The efficiency score of neurosurgery was significantly greater than obstetrics & gynecology, general surgery, orthopedics, emergency surgery, urology, otolaryngology and plastic surgery (p < 0.05).

Conclusion
We demonstrated that the Japanese surgical reimbursement scales continue to fail to reflect resource utilization despite the revision of surgical fee schedule in 2016.

References

This work was supported by Research Grant from Pfizer Health Research Foundation to Dr. Yoshinori Nakata.