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Data analysis of operating room performances for a better management in two Italian Hospitals

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Statement of the problem: The volume of surgical procedures is increasing around the World: it is estimated that 235 million interventions are performed every year worldwide. (1) In 2006, 46 million surgical interventions were carried out only in the USA; one third of these were for patients older than 65 years (2). Moreover, surgery is one of the most expensive activity in a hospital. Due to the above reasons, data analysis of operating rooms (ORs) is crucial for hospital managers. In particular, performance evaluation of efficiency, effectiveness and safety is the basis for internal and external benchmarking (3).

Methodology & Theoretical Orientation: Our study was conducted in two 400 beds hospitals of Veneto Region, Italy (10 operating rooms with 9 surgical specialties in hospital A and 9 operating rooms with 5 surgical specialties in hospital B). We did not consider Ophthalmology in the analysis. The main objective of our study was efficiency improvement. Data were extracted from the ORs information system called "Opera" which is imputed in real time by nurses. We investigated two types of indicators for each surgical specialty in the two hospitals: Times and activities.

For the times indicators median and mean were utilized to measure: a) Surgical times (skin-to-skin), b) Anesthesiological times and c) Turnover times (patient exits- patient enters)

Findings: We analyzed 6108 surgical procedures performed in nine months (period: September 2017 to May 2018). On occupation index (time between the first patient entering the operating room and the last patient coming out over the total scheduled time 08:10-14:30), General surgery was the best in hospital A (88%), while Otolaryngology was the best in hospital B (90,1%). The worst performance was Orthopedics in both hospitals (64,7% in hospital A vs 75,7% in hospital B). Again, the best surgical specialties for first incision times were General Surgery in hospital A (mean 08:57, median 08:45) and Otolaryngology in hospital B (08:47; 08:43); the worst Orthopedics in hospital A (mean 09:17; median 09:14) and General Surgery in hospital B (09:18; 09:05). Considering turnover times, Gynecology was the fastest in hospital A (mean 23 minutes, median 19 minutes) and Otolaryngology in hospital B (18; 18), while Orthopedics was the slowest in both hospitals (32 minutes, mean and median in hospital A; 35 minutes mean and 34 minutes median in hospital B). The percentage of different times are shown in Figure 1 (hospital B as example).

Conclusion: Overall efficiency in the ORs of the two hospitals is good. However, General Surgery, Vascular Surgery, Breast Surgery in hospital A and Otolaryngology in hospital B proved to have much higher performances compared to the other eight surgical specialties considered. Analyzing the main reasons of these differences, an intervention to spread the concepts of lean/six sigma approach and the culture of parallel processing has begun. (4). Results also showed the need of two recovery rooms in order to reduce anesthesiological times as well as a shortage in the number of nurses.

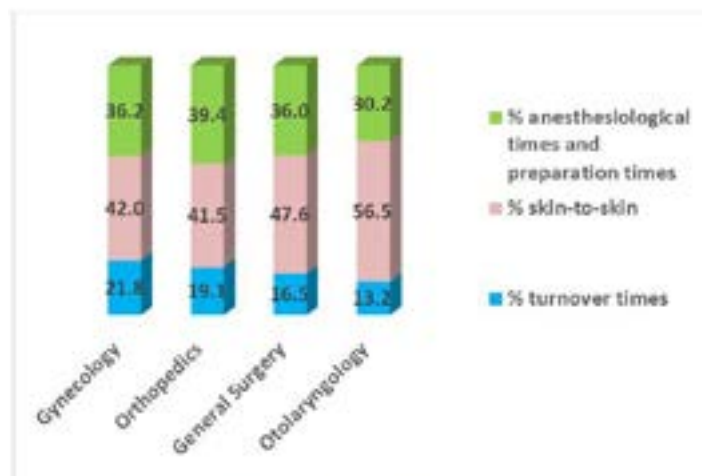


Figure in 1: Sub-division of surgical time (hospital II).

Recent Publications

1. Weiser, Thomas G., et al. "An estimation of the global volume of surgery: a modelling strategy based on available data." *The Lancet* 372.9633 (2008): 139-144.
2. DeFrances, Carol J., et al. "2006 National hospital discharge survey." *Natl Health Stat Report* 5.July (2008): 1-20.
3. McLaughlin, Margaret M. "A Model to Evaluate Efficiency in Operating Room Processes." (2012).
4. Abigail J.Fong et al. "Efficiency improvement in the operating room" (2016)

Biography

Enrico Rosso is a resident doctor in Public Health. He is deeply interested in hospital management, HTA and value based healthcare. He speaks English and French. Currently he is resident doctor in Public Health at University of Padua, Italy.

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