Reviewer’s report

Title: Impact of changed management policies on operating room performance and the distribution of patient categories

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Reviewer: ANGELA TESTI

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Major Compulsory Revisions
The paper is interesting for an important problem faced by surgical hospitals, i.e. scheduling emergency cases among elective surgeries. Main conclusion is that dedicated operating rooms (OR) for emergency procedures improve efficiency.

In my opinion, however, major compulsory revisions are necessary to demonstrate this conclusion. They should regard the specific objective, method and data collection, discussion of the results.

1. Objective: The declared objective is to estimate the impact of the proposed prioritization of emergencies together with OR redesign on OR performance. OR performance, however, is assessed only with regards to volume and case time distribution between shifts. In general, the Authors say that efficiency (or cost efficiency) has improved, but efficiency is not defined precisely (may be the total throughput, given the same resources?). Besides efficiency other performance measures should also be considered. It would be necessary, at least to check 1) for OR occupancy rate by each shift (if OR are occupied only partially, of course, efficiency is not maximized) and 2) whether each patient receives surgery within his maximum acceptable waiting time and, in particular, if the real wait time in the second period is coherent with the patient priority group. In health services efficiency improvement (and cost containment) is valuable only if final impact on patient is granted too. I suggest, therefore, that Authors add more information about these indicators too. If we limit to efficiency, we must check also that no additional cost on staff or other resources were needed, though at parity of OR number. For instance, dedicating ORs to emergency procedures only means only to keep surgery staff always available also in absence of patients both during the day as well during the night.

2. Method: A before-and-after non randomized design was utilized. This method suffers, intrinsically, from several threats to internal validity, because any observed difference in performance are assumed to be due to the intervention. Further complications arise in this case because the redesign is made up of two parts: first, a prioritization tool to better assign urgency class (and the maximum acceptable waiting time) and, secondly, dedicating three ORs, exclusively to emergent patients. Even if we consider that all other conditions are stable, it is difficult to understand whether the good reported results derives from different prioritization criteria or from dedicated ORs. Maybe other methods are better in
this case. For instance discrete event simulation models where many different scenarios can be evaluated to measure the impact of parameters change. In conclusion, the choice of the before-and-after non randomized method should be justified as the best method to evaluate the impact in this case study.

Moreover, more rigorous method consideration are lacking also for justifying the intervention itself. How was estimated that the volume of emergent cases would require three dedicated rooms? Was some queuing model utilized? In absence of a more formal analysis, it is impossible to generalize the obtained results because they appear to be strictly depending on the specific situation of the case study and cannot help in replicating the work or support planning decisions in other hospitals.

3. Discussion of results: In before and after studies interpreting results is not easy, of course, and should be done with caution, preferably checking that confounders are not too relevant or that conditions have not changed between the two periods. This may be particularly relevant with the prioritization that appears to follow different criteria in the two periods. Consequently, all considerations about the different percentages of patients in the three classes seem to be useless and not strictly depending on the new reorganization intervention. Some considerations should be avoided and discussion limited to what is the gist of the problem. Or, some additional data and a more complete description of the case should be considered for better comprehension and validation of the discussion. In the case report, for instance, it seems that throughput increase and variability reduction mostly depend on that more urgent cases have reduced and so scheduling was easier in presence of a longer maximum acceptable time.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests.