**Reviewer's report**

**Title:** Incidence and costs of bleeding related consequences in selected surgical procedures in the French hospital setting (a DRG analysis)

**Version:** 3 **Date:** 13 April 2012

**Reviewer:** Darryl T Gray

**Reviewer's report:**

This is an improved, revised manuscript on a study of hospital costs and prolonged length of stay associated with transfusions and bleeding consequences seen in French surgical inpatient stays. It addresses an important issue and provides useful and interesting new data. However, the analysis and presentation still raise some (generally addressable) issues. For the benefit of the reader, issues raised in prior reviews should generally be addressed in the revised text, rather than just in the cover letter, as was sometimes done. Specific comments follow:

Major Compulsory Revisions (issues that need to be addressed in some fashion. Revisions to the analysis itself may not be required.)

**ABSTRACT:**

Under “Design”, Please clarify the meaning of the sentence starting: “The rates of hospitalizations over the average LOS…” The threshold appears to have been a bleeding “rate” (sic) of “10% or above”, not “over 10%”. This should be fixed in the abstract and throughout the manuscript.

**TEXT**

Page 6—3rd paragraph: As was previously asked, did the French common classification of medical procedures (CCAM) consider procedures such as endovascular aortic aneurysm repairs to be “surgery”? As was previously suggested, an appendix listing at least the *categories* and code ranges of CCAM procedure codes used (not all individual codes) would help.

Page 6—3rd paragraph and Page 8 – 1st full paragraph: Costing methods should still be better described in one place in the article, per various standard articles on cost analyses (Gold, Weinstein, Drummond, others). What are “tariffs” as used in this context? It appears (but should be stated) that having the T2A budget achieved IN 2008 means that costs for all admissions from the entire year of 2008 could be estimated using this method. It appears that *billed* physician fees (rather than those actually paid or expected to be paid) were included in private but not public sector hospital “costs”. This systematic difference should be discussed and might argue for separate analyses of private vs public sector hospital “costs”.
Page 6 – last paragraph: Whether hospital stays of “not less than 2 days” here means stays involving at least two calendar days (as opposed to stays of at least 48 hours which generally involve at least three calendar days) should be clarified in the text. Why was this criterion chosen? Handling of inpatient deaths of less than 2 days should be noted in the text.

Page 6 – last paragraph: As was previously asked, what was the age range for included patients? It would appear that the different spectra of ages, procedures and co-variants seen in pediatric surgical cases would argue for separate analyses of such cases, assuming they were included in the study at all.

Page 7 – 2nd paragraph: The 11 CCAM codes for procedures carried out for secondary haemostasis should be indicated in an appendix. It should be clarified in the text that this only included procedures used to treat bleeding rather than to prevent it.

It appears that the investigators could not distinguish pre-op from post-op transfusions. Were diagnoses that would argue for a pre-op risk of a need for transfusion (e.g. anemia or coagulopathy) captured and used in the analysis?

Criteria used for the merger of DRGs should be better described. Why was this done? As was previously suggested, the DRGs merged into groups should be listed in a table under Results or in an appendix.

Page 8 – 2nd full paragraph: What were numerators and denominators for “the rates of hospitalizations exceeding the expected LOS”? Was this step-up, step-down or some other regression approach? This analysis is still unclear. As was previously asked, how did the analysis address possible clustering by hospital (which may reflect case-mix, propensity to transfuse, etc)? It appears that hierarchical modeling using generalized estimating equations or other approaches were not considered as a way to adjust for clustering of cases within hospitals? Can the authors explain why not? If a given hospital had generally higher costs, and, as an independent issue, had more bleeding complications, then some of the cost difference attributed to bleeding would actually be due to hospital characteristics. Given the potential for non-Gaussian distributions of hospital costs and/or LOS, the skewness of the cost and LOS data should be described. Given recent work done on handling non-Gaussian distributions of hospital costs, discussions based on papers published more recently that 2000 would be more reassuring. The ways in which non-Gaussian distributions of hospital costs were accounted for in the regression analyses should be better described. Since post-op transfers TO other acute care hospitals were not included, then listed LOS and cost estimates would underestimate costs of the total inpatient episode of care. Please comment on the proportions of cases with vs without bleeding that were transferred out.

Page 8 – 3rd full paragraph: It is still unclear how or why LOS and costs were adjusted for age and gender alone (vs other factors) for the bleeding complications group. And why weren’t adjusted costs and LOS calculated for cases without bleeding?
Total #s of surgical DRGs merged (into how many total groups?) should be noted and described in an appendix.

Page 9 – 4th paragraph: This says rates were also adjusted for #s of procedures, This is not noted under methods. The rationale and methods used for this should be described under methods

Minor Essential Revisions:

Writing in what may be the authors’ second language may be difficult. However, the numerous typographical, grammatical and English word usage errors that still exist in this manuscript make following it difficult at times. These could be corrected through a more thorough manuscript review performed by a native English speaker than has been done so far.

Page 10 and Table; age categories such as 65-70 and 70-75, etc are not mutually exclusive in that 70 appears in both categories. Analyses should reflect results with ages such as 70, etc. being in one category (but not both).

Page 13 1st full paragraph: The purpose of the following passage is still not quite clear and should be clarified: “If we compare the number of surgical patients transfused during the “one day” national survey [8] on transfusions, we can observe that 742 surgical patients were transfused with erythrocytes units during the survey. If we adjust on the total number of erythrocytes unit consumed per year in the French hospitals (n=2,013,863 in 2006) [7], the number of erythrocytes unit recorded during the survey (n=5,765) then the pooling rate can be estimated at 1/350. During our PMSI analysis, the 77,921 surgical patients that were considered with bleeding and the vast majority because of transfusions, therefore our estimate represents approximately one third of the number expected with transfusions alone (77,921/742/1/350).“

As was previously noted, references with URLs should better describe the title of the actual citation. as well as the URL.

All Figures should have figure #s, and the axes should be labeled. It would help to include titles with the figures.

“WB” rates for all DRGs or DRG groups (including those with WB” rates < 10%) should appear at least in an appendix.

**Level of interest:** An article of importance in its field

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

**Statistical review:** Yes, but I do not feel adequately qualified to assess the
statistics.

Declaration of competing interests:

I declare that I have no competing interests