Reviewer’s report

Title: Role of tube size and intranasal compression of the nasotracheal tube in respiratory pressure loss during nasotracheal intubation: a laboratory study

Version: 1 Date: 14 Jan 2017

Reviewer: Alexander Kuo

Reviewer's report:

This is a detailed study on the increased pressure loss caused by 1) intra-nasal compression and 2) curvature nasal tracheal tubes. My primary concern is the complex organization of the paper will make it difficult to follow and read for the general anesthesiologist reader.

I recommend general re-organization/clarification of the structure of the paper to significantly clarify what the authors are doing. In it's current form it is difficult to follow:

1. We measured in-vivo compressed diameter of nasal tracheal tubes, and the length of compression on CT scans.

2. We performed in-vitro bench top testing of pressure loss, with nasal tracheal tubes uncompressed and compressed to similar dimension based upon in-vivo measures from part 1.

3. We then used established fluid dynamic equations to calculate the expected pressure loss an equivalent straight tube.

4. From our total pressure loss measurements in part 2, we subtracted pressure loss from the slip joint measured in prior study, and the pressure loss expected from a straight tube calculated in part 3. We attributed the remaining pressure loss to the curvature of the NTT.

Results should follow a similar structure.

Also the figures after figure 4 all the figures seem mis-numbered and mis referenced in the text with an extra figure 4 inserted.

Pg 5 Ln 46

The next several paragraphs seem to have excessive discussion for the Introduction. It would suffice to say that something like:
The total pressure loss is the sum of pressure losses induced by the separate components: 1) Slip joint, 2) tubular section with compression, and 3) curvature. Also because of turbulent flow and abrupt transition from the exit of the NTT to tracheal, there is negligible dynamic pressure recovery.

Pg 11 ln 16
Consider breaking the details of the fluid dynamic calculations into a separate section, as it may be overwhelming for the general anesthesiologist reader.

Pg 14, ln 14
Figure 4 seems mislabeled. It seems it should be figure 5a and figure 5b

Pg 14 ln 26
It may be notable that it was 7.0 tubes in Women had higher compressive force than 7.5 in Men. Otherwise it may give the reader the impression that small tube have higher compression, instead of the fact that women have small nasal passages.

Pg 14 ln 30
Figure 5 seems to actually refer to figure 6. Figure 4 seems it should be figure 5a and figure 5b.

Pg 14 ln 52
It would be more clear to state that the "total measured pressure loss minus the previously reported slip joint pressure loss is..." instead of "tubular part "

Figure 7 B
Again it seems it would give the reader a better sense of what the author is doing if described as "measured pressure loss minus slip joint pressure loss." Instead of "measured pressure loss through tubular parts."

Figure 8
The description should note these are the calculated pressure losses from the Darcy-Weisbach equation.

Figure 9
The description should note these are the calculated pressure losses from the Darcy-Weisbach equation subtracted from the measured pressure loss to give the pressure loss from the curvature. "Discrepancies" implies some sort of error in measurement.

Figure 10: Should be discussed in the results.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

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If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

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