Letter to the Editor
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Letter to the Editor – Response to: The effect of dental scaling noise during intravenous sedation on acoustic respiration rate

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Dear Editor:

Masimo is the manufacturer of the RAM respiratory acoustic monitoring device, which can continuously measure the acoustic respiratory rate, RRa®. This was the subject of a recent study by Kim et al [1], published in your journal. In this retrospective study, the investigators evaluated whether noise from an ultrasonic dental scaler affects the accuracy of RRa during intravenous sedation. The study used prerecorded data from a previous study on patient-controlled sedation, and reanalyzed these data to extract results on respiratory rate measurement by two methods. There is no "gold standard" for respiratory rate in this study. It is simply a comparison of two independent methods of respiratory rate measurement during acoustic dental scaling: RRa and nasal cannula capnography.

In the study, Kim et al used the correlation coefficient (R) to compare two methods of measuring the same variable (respiration rate). This is not the appropriate statistic for this comparison. The values of R will depend on the respiratory rate range covered by the data, and hence are not helpful. The most useful statistics in a methods-comparison study are the Bland-Altman "Bias" (mean difference of methods) and "Precision" (standard deviation of differences).

In addition, only 49 of 60 total subjects were selected for the data analysis. Eleven subjects were eliminated because they exhibited "oral respiration" (mouth breathing). This is a serious limitation, because mouth breathing is known to cause large errors in respiratory rate measured by nasal cannula capnography [2,3]. By eliminating these eleven subjects, the investigators are ignoring the most serious error from one of their two respiratory rate methods.

The capnograph waveform shown in Fig. 1 clearly shows missing breaths at times between 310 and 330 seconds, yet the plot of RR measured by capnography shows no change during that period. Investigators also observed a RRa dropout rate of 8% during the period of sedation before the acoustic scaling commenced. This

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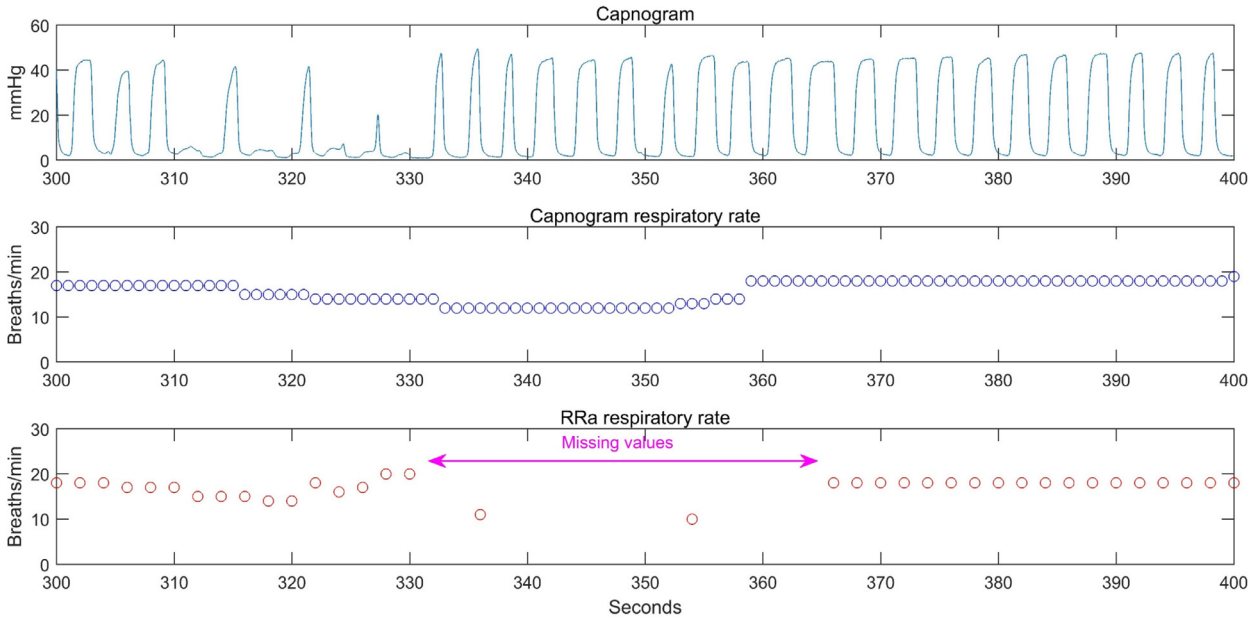

Fig. 1. Stored capnogram wave was confirmed, and the numbers of respiratory rates with capnogram and acoustic respiration rate (RRa) were extracted at 2-s intervals. Values not recorded on RRa were defined as missing values.

finding is inconsistent with the published literature [4, 5].

We are concerned that the results presented in this paper may be misinterpreted, especially considering the bias introduced by removing all data from mouth breathing subjects, which removes the largest respiratory rate error of nasal capnography.

We look forward to continuing to work with investigators across the patient care continuum to evaluate how RRa monitoring can improve clinical outcomes.

Respectfully yours,

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