



COMPARISON OF VENTILATION WITH THE NUMASK® VS. TRADITIONAL MASK, A PROSPECTIVE, RANDOMIZED, CROSSOVER STUDY

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INTRODUCTION

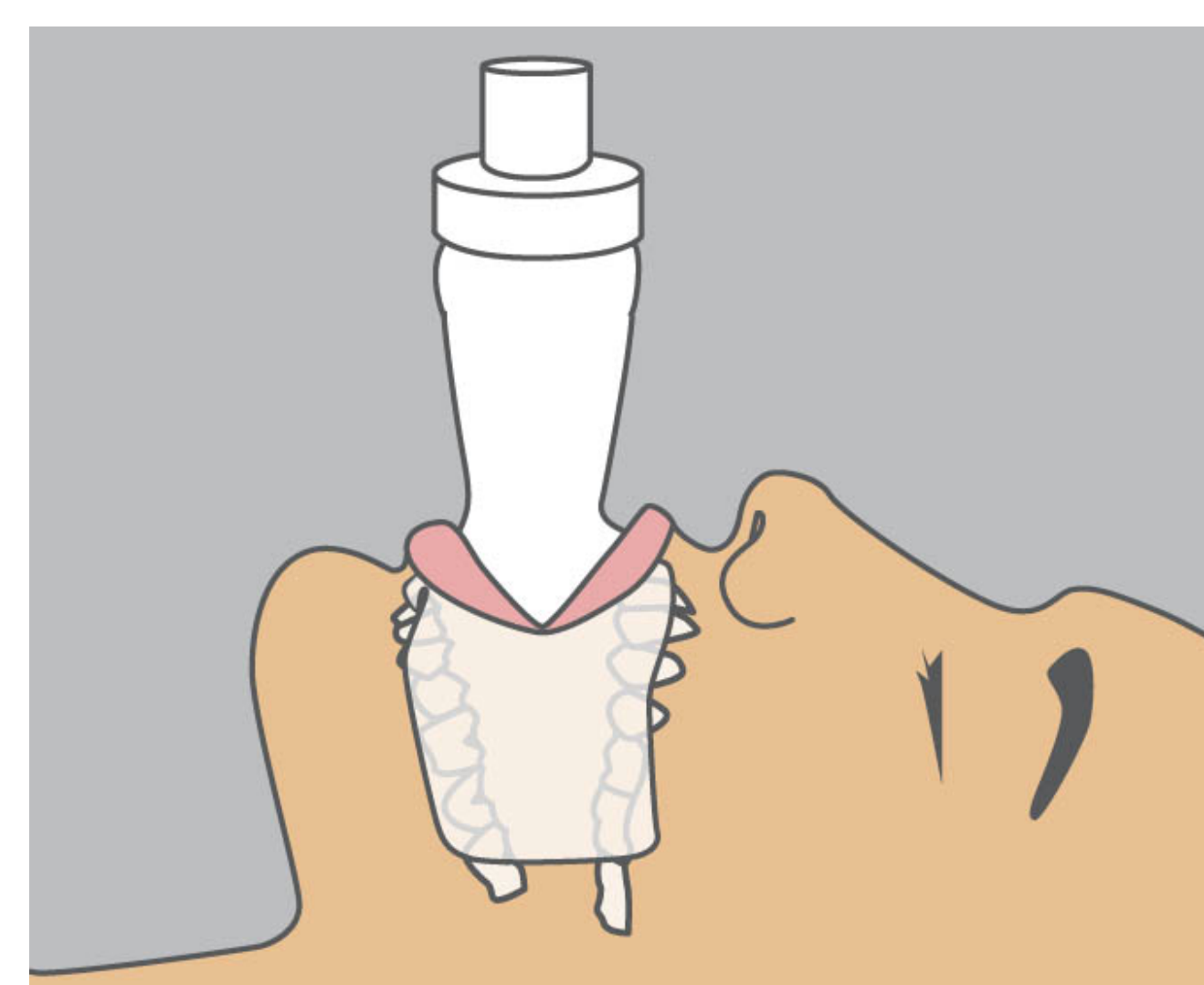
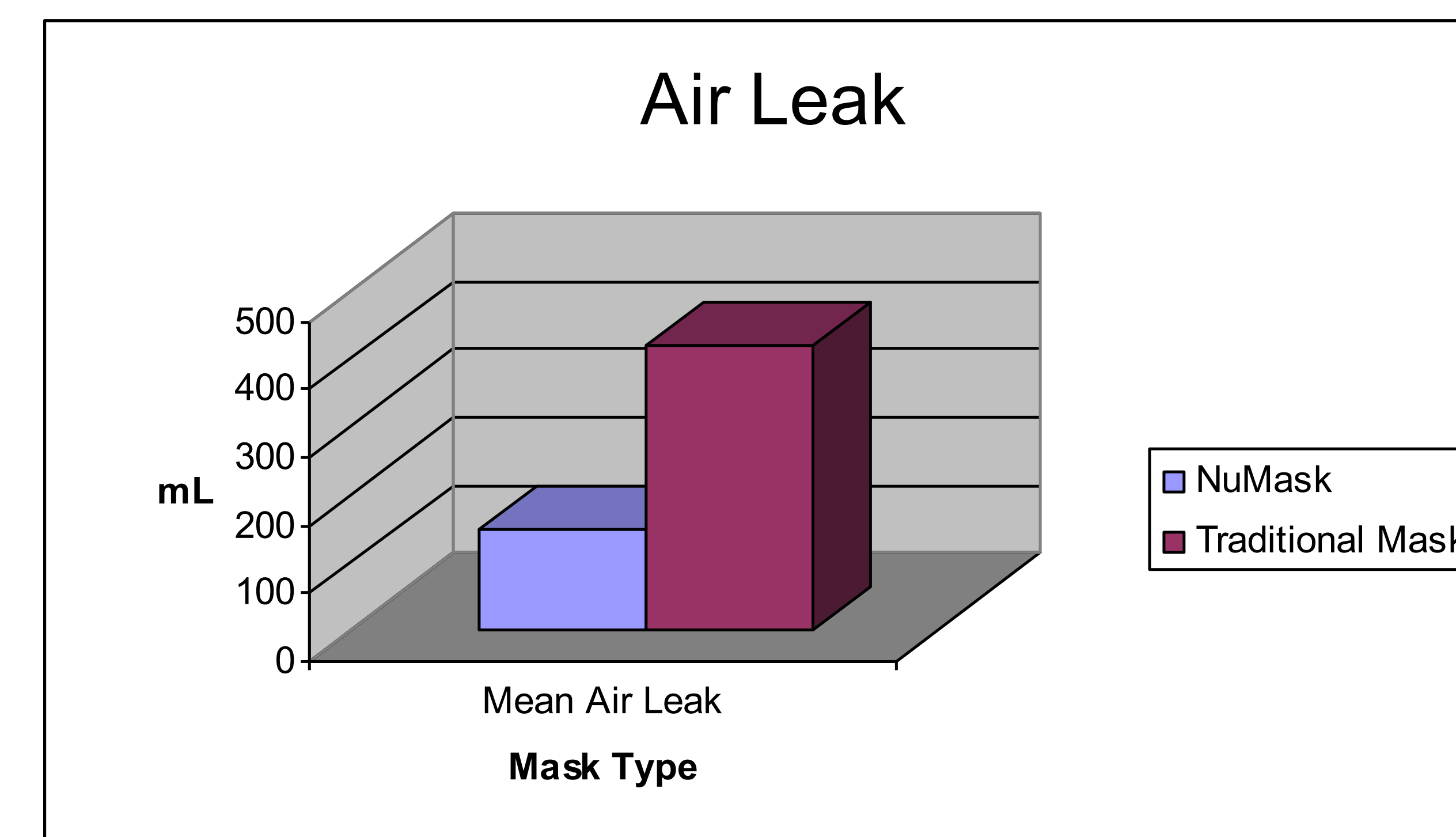
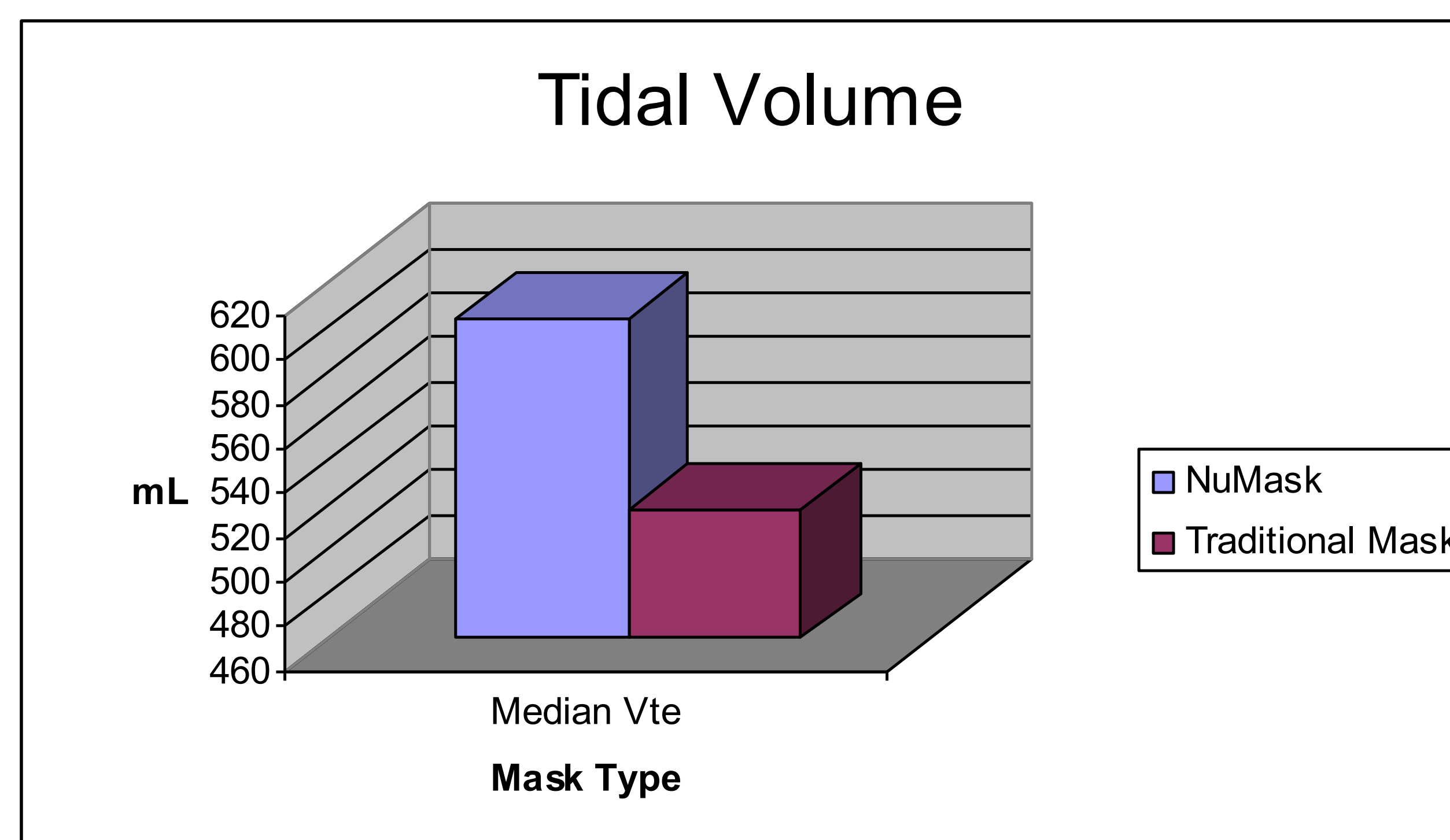
The ability to ventilate and oxygenate unconscious patients is of utmost importance in the field of anesthesiology. We hypothesized that ventilating patients with traditional predictors of difficulty, BMI>35 and/or beard, with the NuMask® device (NuMask, Inc., Woodland Hills, CA) would be better than traditional mask ventilation.

METHODS

After University of Utah IRB approval, experienced anesthesia providers ventilated a total of 28 anesthetized and paralyzed patients, with characteristics associated with difficult mask ventilation, by randomly using both the NuMask® device and a traditional facemask. Using pressure controlled ventilator settings of 20 cm of Hg at 10 breaths per minute, we measured inspired and expired tidal volumes (Vti & Vte) as well as average air leak using the CO₂SMO® (Philips, Respironics, Andover, MA) in order to determine difference between masks. Data presentation is by medians and IQRs; data analysis uses linear mixed effects regression models (RSTUDIO version 0.97.336, R version 3.0.0, lm4 version 0.999999-2) and reports means and SEs.

RESULTS

For all patients preliminary data analysis revealed that the median (IQR) Vte delivered for all breaths was 604 (444, 914) mL and 519 (342, 791) for NuMask® and traditional mask respectively. The median difference in Vte was about 85 mL greater with the NuMask®. The mean (95% CI) air leak was 377 mL (295 ,447) analyzed for all breaths with both masks (air leak not zero; p < 0.001). The NuMask® had a mean air leak 272 mL (228, 322) less than the traditional mask (p < 0.001). The air leak did not change significantly during the 10 breaths. The presence of a beard (9/28 patients) did not change the air leak difference between NuMask® and traditional mask (p >.05). As most patients (24/28) had a BMI > 35 and only 2/28 were edentulous, an analysis of those factors was not possible.



SUMMARY

The NuMask® appears to be an effective tool for mask ventilating patients who have traditional predictors of difficult mask ventilation. On average the NuMask® was associated with greater measured exhaled tidal volumes and smaller air leaks. In our study this indicated more effective ventilation.

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