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Title: BMI is not the driving factor in position dependent upper airway collapsibility in healthy subjects

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Body: Introduction In obstructive sleep apnea (OSA) patients, the minimal cross sectional area (CSA) of their upper airway (UA) correlates well with the severity of their pathology. However, since there is a correlation between body mass index (BMI) and severity of OSA in a population of OSA patients, it is not known if the minimal CSA is defined by the natural collapsibility of the UA or by the mass of the surrounding tissue. The objective of this study is to evaluate the influence of BMI on the position dependent changes in UA geometry assessed by CT imaging. Materials and Methods A total of 20 normal subjects where 7 had a BMI<25, 6 had a BMI between 25 and 30 and 7 had a BMI>30 were included. 15 valid CBCT scans could be analyzed as the rotating gantry of the CBCT touched the shoulders of some subjects with a BMI>30, causing motion artifacts. The supine UA CT scans were performed using the GE VCT LightSpeed scanner and the upright CBCT scans were performed using the ISI i-CAT scanner. Results BMI was not a predictor for difference between the minimal CSA in a supine and upright posture ($R = 0.05$, $p = 0.86$) as seen in the figure.

Conclusions It can be concluded that in a healthy population, the BMI has no influence on the position dependent collapsibility of the airway. This means that collapse of the UA in healthy subjects is mostly defined by the natural collapsibility of the subject's airway.