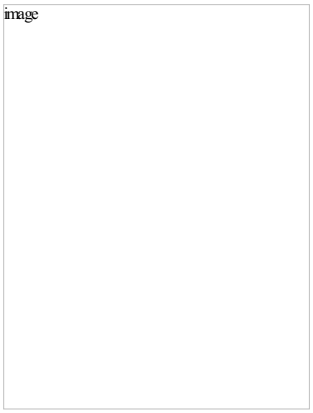

www.elsevier.com/locate/bios

PII: S1550-7289(18)30147-3
DOI: https://doi.org/10.1016/j.soard.2018.03.021
Reference: SOARD3332

To appear in: *Surgery for Obesity and Related Diseases*

Cite this article as: , , *Surgery for Obesity and Related Diseases,* doi:

Regression-based Approach is Needed to Compare Predicted and Measured Resting Metabolic Rate after Weight Loss and Body Composition Changes.

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Comment on: Resting Metabolic Rate and Weight loss after Bariatric Surgery

Roux-en-Y gastric bypass (RYGB) surgery provides for substantial weight loss in most patients with severe obesity, and the long-term success of RYGB is proven to be superior in comparison to lifestyle and non-surgical treatment options alone [1, 2]. While weight loss is comprised mostly of low metabolic fat mass, 15 to 25% of the weight change is from loss of thermogenic active lean body mass (LBM) [3, 4]. Having in mind that LBM is the primary determinant of resting metabolic rate (RMR), RMR after weight loss is expected to decrease. However, as the ratio of LBM/fat mass per each Kilogram (kg) of body weight increases after weight loss, RMR per kg of body weight (RMR/kg) increases. Interestingly, studies evaluating changes in RMR after a non-surgical weight loss have found that changes in RMR are greater than would be predicted from changes in LBM and fat mass alone during periods of energy imbalance [5, 6] . This phenomenon of a greater than expected reduction in RMR is called adaptive thermogenesis, and an adaptive thermogenesis-related downregulation of RMR has been implicated in suboptimal weight loss and weight regain after nonsurgical weight loss. Notably, recent evidence suggests that the sustainability of weight loss after RYGB maybe at least partially attributed to the unexpected greater support of RMR or blunting of adaptive thermogenesis, even after the significant reductions of both thermogenic LBM and fat mass is observed after surgery [6, 7]. These observations are in direct contrast to the observations of significant adaptive thermogenesis after non-surgical weight loss.

In this issue of *Surgery for Obesity and Related Diseases*, Mota et al.[8] showed, in 45 patients that had open RYGB, that RMR/kg increased significantly six months after surgery, and noted that higher post-operative RMR/kg was associated with greater percentage of excess weight loss (EWL). The authors also suggest that the association between the increase in RMR/kg and EWL was independent of changes in LBM or fat mass. We agree with the supposition that RYGB may positively affect RMR to promote weight loss and defend against weight recidivism. However, we caution against the use of simple ratios of RMR/kg and also