

# Thigh Laxity After Massive Weight Loss

## A Utilities Outcomes Assessment

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**Background:** The presence of excess skin after massive weight loss, particularly in the thighs, not only contributes to a negative body image but can also lead to functional deficits in mobility. In the present study, we quantified the health state utility of living with excess skin in the thighs in an attempt to objectively establish the burden on the quality of life in patients living with excess thigh skin laxity.

**Method:** Using visual analog scale (VAS), time trade-off (TTO), and standard gamble (SG), we compared the utility outcome scores for thigh skin excess with monocular and binocular blindness from a prospective sample of medical students and the general population. Utility scores were compared using paired *t* test. Linear regression was performed using age, race, and education as independent predictors of each of the utility scores.

**Results:** One hundred thirty-four prospective participants were enrolled during a 6-month period, and 112 participants met our inclusion criteria. The utility outcome scores for thigh lift (VAS, TTO, and SG,  $0.77 \pm 0.15$ ,  $0.90 \pm 0.11$ , and  $0.89 \pm 0.14$ , respectively) were statistically different from binocular blindness (VAS, TTO, and SG,  $0.37 \pm 0.18$ ,  $0.70 \pm 0.23$ , and  $0.70 \pm 0.26$ ;  $P < 0.001$ ), but other than VAS ( $0.67 \pm 0.15$ ,  $P < 0.001$ ), similar to monocular blindness (TTO and SG,  $0.89 \pm 0.13$  and  $0.81 \pm 0.14$ , respectively;  $P > 0.05$ ). SG ( $0.89 \pm 0.14$  vs  $0.97 \pm 0.02$ ,  $P = 0.003$ ) and TTO ( $0.89 \pm 0.11$  vs  $0.95 \pm 0.03$ ,  $P = 0.038$ ) were different between general population and medical students, respectively, corresponding to 3.96 versus 1.80 potential years willing to be traded ( $P < 0.05$ ). Additionally, SG was higher in whites versus nonwhites who were willing to take a potential 8% chance of mortality compared to 15%, respectively ( $P = 0.001$ ), to achieve "perfect" health.

**Conclusions:** We have objectified the utility of living with thigh deformity after massive weight loss. Our sample population if faced with the condition was willing to sacrifice a potential 3.6 years of life and potentially undergo a procedure with 11% chance of mortality to address excess thigh laxity.

**Key Words:** massive weight loss, thighplasty, QALY, thigh laxity, utility score

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Bariatric surgery has been shown to be one of the few truly effective treatments of obesity and associated comorbidities.<sup>1</sup> Between 1996 and 2002, the rate of bariatric surgery increased

7-fold, from 3.5 per 100,000 to 24.0 per 100,000 in the United States.<sup>2</sup> However, despite the benefits of bariatric surgery and associated weight loss in obese persons, massive weight loss frequently results in aesthetic and functional impairment. Redundant skin of the medial thigh after massive weight loss is of particular concern to many patients and is often a site where rashes and sores develop.<sup>3</sup> The excess skin on the inner aspect of the thigh can impair mobility, further exacerbating the patient's perception of the aesthetic deficiency. A recent study has shown that although more than 50% of women rate their thighs as either unattractive or very unattractive after massive weight loss, only 7% proceeded with thigh lift surgery to correct the deformity.<sup>4</sup>

Utility scores have proven to be an effective tool for providing insight into patient perception of various health states. Benchmark utility scores for common pathological states including diabetes mellitus, end-stage renal disease on dialysis, and human immunodeficiency virus infection have been calculated, which serve as practical references to understand patient perception of various investigated health states and health-related quality of life.<sup>5–7</sup> The visual analog scale (VAS), time trade-off (TTO), and standard gamble (SG) have been shown to possess considerable value when assessing utility and the burden of an individual health state.<sup>8–12</sup> The resulting scores from a surveyed random population can provide perspective on the impact of various health states on quality of life, and thus potentially impact economic decisions on allocation of health care resources for treatment modalities that matter most to patients.<sup>8,13,14</sup>

In this study, we sought to understand whether the discrepancy between patient dissatisfaction with excess skin in the medial thigh and the low rate of surgical correction was associated with the burden of disease. Using the VAS, TTO, and SG utility scores, we objectively quantified the burden of having redundant skin in the thigh by surveying a random sample of individuals recruited via the Internet. The responses for abnormal thigh contouring were compared to monocular and binocular blindness to demonstrate patient perception of excess thigh skin related to a familiar medical condition. Standardization of the burden of disease associated with redundant skin in the thigh after massive weight loss will allow for objective allocation of health care coverage reflective of true patient demand for corrective thigh lift surgery.

## METHODS

The study presented was approved by the Research Ethics Board of McGill University and the McGill University Health Centre in accordance with the Declaration of Helsinki ethical principles for medical research involving human subjects. All respondents of the survey completed an electronic form indicating informed consent. The patient depicted in the photograph used in the survey signed written consent allowing use of the photograph in the survey, publication, presentation, and any other research-related endeavors.

A random sample of participants from the general population was recruited for the study on the Internet Web sites <http://craigslist.ca/> and <http://kijiji.ca/>, and medical students were recruited from McGill University via announcements through the Faculty of Medicine student

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