

# The Impact of Living With a Functional and Aesthetic Nasal Deformity After Primary Rhinoplasty

## A Utility Outcomes Score Assessment

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**Background:** Revision rhinoplasty for functional deformities can be both an aesthetic and reconstructive surgical challenge. We set out to quantify the health state utility assessment of living with the physical appearance of nasal asymmetry along with having nasal obstruction. The use of utility scores has helped to establish the health burden of living with various medical conditions. We sought to quantify living with a health state of nasal asymmetry with nasal obstruction after primary rhinoplasty using utility outcome scores.

**Methods:** We used previously validated utility outcome measures to quantify the health burden of this clinical scenario in 128 prospective subjects. These subjects were from a sample of the population and medical students recruited to complete a survey to determine the utility outcome score of revision rhinoplasty using visual analog scale (VAS), time trade-off (TTO), and standard gamble (SG) tests to obtain utility scores for revision rhinoplasty. Linear regression and Student *t* test were used for statistical analysis.

**Results:** All measures (VAS, TTO, and SG) for functional nasal deformity ( $0.80 \pm 0.13$ ,  $0.90 \pm 0.12$ , and  $0.91 \pm 0.13$ , respectively) of the 128 prospective subjects participating in this online study were significantly different ( $P < 0.005$ ) from the corresponding scores for monocular blindness ( $0.63 \pm 0.15$ ,  $0.85 \pm 0.16$ , and  $0.85 \pm 0.19$ , respectively) and binocular blindness ( $0.38 \pm 0.18$ ,  $0.66 \pm 0.25$ , and  $0.69 \pm 0.24$ , respectively). Being white was inversely related to the VAS utility scores for rhinoplasty ( $P < 0.05$ ). Additionally, female sex was positively correlated to the TTO score. Age, income, and education were not predictors of utility scores.

**Conclusions:** In a sample of the population and medical students, VAS, TTO, and SG utility scores for revision rhinoplasty were determined and can be compared objectively with other health states and diseases with known utility scores. In a preoperative setting, women were objectively willing to potentially “trade” more years of life to treat a functional nasal deformity. If faced with a deformed nose after primary rhinoplasty, our sample population would consent to undergo a revision rhinoplasty procedure with a theoretical 9% chance of mortality and were willing to trade 3.6 years of their remaining life.

**Key Words:** rhinoplasty, nasal obstruction, breathing, aesthetic, functional rhinoplasty

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Rhinoplasty is among the most performed procedures in the United States today (305,475 in 2004, according to American Society of Plastic Surgeons).<sup>1</sup> Planning rhinoplasty requires careful examination, evaluation of patient’s goals and concerns, and an understanding the baseline status of the patient’s nasal physiology. Primary rhinoplasty is commonly a successful procedure; however, at times it can lead to deformities that can be troublesome both functionally and aesthetically for patients. Some of the most common deformities after primary rhinoplasty include dorsal overresection, nasal obstruction, septal deviation, saddle nose deformity, depression of supratip area, alar pinch deformity, and collapse of nasal valves.<sup>2</sup> Like other elective procedures, any potential correction of these functionally and aesthetic deformities requires a careful preoperative discussion with the patient and surgical planning.

Utility outcome scores are standardized measures for objectifying health states or diseases.<sup>3–6</sup> They range from 0 (death) to 1 (perfect health). These scores not only assist in comparing different diseases or health states but may also be helpful in determining health resources allocation for treatment and research.

Several validated tools for determining health utilities exist.<sup>3–6</sup> Using more than 1 utility tool assists in minimizing bias and overcome weaknesses associated with each individual utility outcome score. Three common validated utility scores include standard gamble (SG),<sup>7</sup> time trade-off (TTO),<sup>8</sup> and visual analog scale (VAS).<sup>9,10</sup> When utility outcome measures are studied from a sample of the general population, they can be extrapolated to a large population and can be used for health care funding allocations<sup>5–7</sup>; in this case, nasal obstruction would specifically be relevant in this discussion. In this study, an Internet-based Web site was used to recruit a large population-based sample (both general population and medical students) without the need for expert interviewers, which can substantially reduce study expenses and decrease interviewers bias.<sup>8</sup>

## METHODS

After approval from the Research Ethics Board at McGill University, an Internet-based Web site was designed with an electronic consent form to be signed by all prospective participants before taking part in the study. A patient’s image with nasal deviation after primary rhinoplasty was presented with patient’s consent (Fig. 1).

Utility scores were measured using an open enrollment Internet-based assessment Web site for evaluating the health state of a nasal deformity with functional concerns (ie, nasal obstruction) after primary rhinoplasty. Prospective subjects were recruited through 2 Web site s ([www.kijiji.com](http://www.kijiji.com) and [www.craigslist.org](http://www.craigslist.org)). Medical students were also recruited separately through a weekly Internet-based newsletter at McGill University.

Prospective subjects were asked to complete their demographic information such as age, sex, level of education, and income. To familiarize participants to the utility scores, they were queried with evaluating utility scores (VAS, TTO, and SG) for monocular and binocular blindness. Those participants rating monocular blindness as having lower utility scores compared to binocular blindness were