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PERSPECTIVE

Body Mass Index Requirements for Gender-Affirming Surgeries Are Not Empirically Based

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Abstract

Body mass index (BMI) requirements for gender affirmation surgery (GAS) are ubiquitous and vary across providers. Requirement variation is not surprising given little data to suggest an association between BMI and GAS outcomes. Implementation of subjective BMI requirements limits access to GAS and negatively impacts patient health and safety. We outline the literature on BMI and GAS outcomes, discuss clinical utility of GAS, and summarize dangers of prescribing weight loss as a prerequisite for surgery. We propose that providers use empirically supported indices of health and comorbidity instead of BMI to determine surgical eligibility for all patients considering GAS.

Keywords: BMI; gender affirmation surgery; gender nonconforming; LGBTQ Healthcare; transgender

Although the World Professional Association for Transgender Health (WPATH) guidelines for gender affirmation surgery (GAS) do not specify a body mass index (BMI) requirement,[1] providers performing these procedures often do. Many programs tell patients to lose weight before surgery and require the patient's BMI to be <30, 33, or 35 kg/m^2, or they evaluate individuals $>30\,kg/m^2$ BMI on a case-by-case basis (e.g., Beth Israel Deaconess Medical Center[2]). Notably, medical insurance coverage is contingent on "medical conditions" being "reasonably well controlled" (e.g., Blue Cross Blue Shield of California[3]). Given the broader medical culture that often equates larger body size with poor health, such vague guidelines leave room for providers and programs to approximate how "controlled" medical conditions are by screening BMIs. Such criteria serve as barriers to essential surgeries[4] and do not have an empirical basis.

BMI has been widely criticized as a marker of health or wellness due to its two-dimensional nature (i.e., weight/height^2). Although a full critique is outside the scope of this article, it is worth mentioning that BMI persists into the modern day as a relic from a mathematician's efforts to categorize body weight in Europe during the 1800s. In particular, BMI as a determinant of health for nonwhite noncisgender bodies is profoundly problematic, as it was never validated in these populations. This is evidenced by a growing body of work questioning the validity of BMI within racial/ethnic minority communities.[5,6] Black individuals have been shown to have higher BMI on average than their white counterparts, and this disparity is not reflective of increases in visceral fat.[7] Likewise, transgender and gender nonconforming (TGNC) folks tend to exhibit higher BMI[4] for a range of reasons, including engagement in gender-affirming hormone treatment (notably, a year of which is a WPATH criteria for surgery),[1,8] decreased access to health-promoting resources (e.g., nutritionally dense foods, affirming spaces, and social environments supportive of physical exercise),[9] and higher risk of binge eating and related disorders.[10] As such, BMI requirements for GAS disparately impact TGNC and racial/ethnic minority communities compared with cisgender white communities.

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It is well understood across disciplines that for those who wish to pursue medical transition, GAS profoundly improves health and safety outcomes. Such procedures have been shown to improve quality of life[11] by decreasing gender dysphoria, which is linked to negative mental health outcomes, including depression, disordered eating, suicidal self-directed violence, and trauma-related symptoms.[10,12] Furthermore, research shows that denying TGNC individuals timely access to GAS significantly increases their risk of suicidal ideation and attempted suicide,[13] while also denying them access to the benefits of GAS, which include greatly reduced psychological symptoms and gender dysphoria.[11,14] GAS can also help individuals "pass" as the gender with which they identify, which in turn decreases the risk of bias-related victimization and discrimination.[15] GAS procedures are clearly essential to the well-being and survival of TGNC individuals, and barriers to such treatment must not be taken lightly.

BMI Is Not a Predictor of GAS Outcomes

We recognize the variability of surgical procedures utilized in gender transition and that procedure choice is largely directed by patient preference. As such, there are gender-affirming procedures not specifically encompassed by this review. The literature cited to support BMI requirements for GAS includes a range of studies showing that BMI $>30\,kg/m^2$ is associated with increased operative time due to technical difficulty, increased risk of surgical site infections, increased risk of postoperative arrhythmia, and other postoperative complications in surgeries that are mostly large abdominal, cardiac, and oncological.[4,16,17] That said, not all evidence suggests greater risk for higher weight individuals, as one orthopedic study found that underweight status (BMI $<18.5\,kg/m^2$) poses higher surgical risk of any adverse event, severe adverse event, or postoperative infection compared with normal-weight and overweight (BMI $>24.9\,kg/m^2$) categorizations, which had no relative increased risk.[18] Most pertinent to this article, literature suggests that the most commonly pursued GAS procedures (genital and chest) can be safely performed on obese* patients, defined by BMI $>30\,kg/m^2$.

Penile inversion vaginoplasty is considered the gold standard for gender-affirming vaginoplasty, and a growing body of evidence suggests no difference in perioperative outcomes for patients with BMI $>30\,kg/m^2$ as compared with those with BMI $<30\,kg/m^2$.[19,20] Several retrospective reviews of patients who underwent penile inversion vaginoplasty found that BMI was not predictive of complications or need for revisions.[21,22] Although some studies, reflective of single-surgeon experiences, suggest BMI is associated with increased risk of complications, the odds ratio was notably lower than for other identified significant risk predictors.[23] Similar findings have been reported for masculinizing genital procedures. Although the selection of phalloplasty technique is influenced by BMI, complication rates for the approach preferred for patients with BMI $>30\,kg/m^2$ are lower than for other accepted techniques.[24] In addition, BMI was not found to be predictive of complication risk for gender-affirming hysterectomy; American Society of Anesthesiologists (ASA) classification, a more comprehensive metric of health status, was found to better correlate with surgical outcomes.[25]

Regarding gender-affirming mastectomy, existing evidence that BMI is a predictor of complications is mixed at best. Some data, reflective of single-surgeon experiences, indicate that higher BMI correlates with surgical risk; however, this association was found to be modest in comparison with other identified risk factors.[26] In contrast to this modest association, a large retrospective review demonstrated that patients with greater BMI do not have significantly higher odds of complications or revisions, which was consistently shown across all classes of "obesity."[27] Also of note, BMI was not found to be predictive for all-cause complications of augmentation mammoplasty.[28]

Risks of Weight Loss Prescription

Although providers often prescribe weight loss for patients with an elevated BMI seeking GAS, there is minimal empirical evidence that dieting and weight loss programs are effective for achieving significant and sustained weight-related outcomes,[29,30] and this has been specifically found in a sample of TGNC individuals denied GAS who were not able to gain eligibility through behavioral weight loss programming.[4] Rather, patients who engage in dieting have been shown to gain significantly more weight than nondieters in the long and short term, contributing to a dangerous pattern of body weight destabilization known as weight cycling. Weight cycling is strongly associated with multiple negative health outcomes, including all-cause mortality, cardiovascular disease, immunosuppression, reduced bone mineral density, and chronic inflammation.[29]

Furthermore, such messages from providers foster and perpetuate weight stigma. This contributes to a

*The authors do not promote the use of the term "obese," as its Latin roots mean "to eat oneself fat." This implies that body size is based upon individual behavior (i.e., how much one eats), which is not reflected in research on social determinants of health and body diversity.

positive feedback loop of weight cycling through behavioral, physiological, and emotional stress responses[31] and is also associated with increased frequency and severity of disordered eating behaviors (e.g., fasting, vomiting, and binge eating).[32] These behaviors independently increase an individual's age-adjusted mortality rate, while associated nutritional deficiencies impede wound healing and increase risk of surgical site infections.[33,34] In addition, it is worth noting that GAS procedures could help patients decrease binge eating and other disordered eating behaviors associated with weight gain/cycling by decreasing gender dysphoria, which has been shown to be related to disordered eating behaviors.[10,12] Thus, providing as many people as possible access to GAS could help reduce weight cycling among TGNC individuals.

As TGNC individuals are at higher risk for self-reported disordered eating, depression, anxiety, and other mental health conditions,[10,12] prescribing weight loss may precipitate or exacerbate these conditions, potentially preventing such individuals from meeting WPATH mental health requirements for surgery.

Conclusion

We suggest that GAS providers question the prevailing assumption that BMI is a useful heuristic for approximating surgical risk, as a growing body of evidence indicates it has little utility in this context. Instead, we propose that providers use risk factors and health indices that are more predictive of GAS outcomes (e.g., ASA classification, breast volume, and presence of comorbidities). More broadly, requirements for GAS should not be arbitrarily set at the provider's discretion without considering the empirical basis. Without this critical step, providers run the risk of allowing weight-related bias to drive medical decisions. Furthermore, it is harmful to prescribe weight loss to meet BMI requirements, as TGNC individuals are at risk of many sequelae from such an intervention.[10,12,29,32–34]

In the event that comorbidities correlated with higher BMI are present and confer significant surgical risk, we recommend a more guided approach to helping patients move toward GAS. For example, if cardiovascular risk is present, providers may suggest that TGNC patients seek support from TGNC-affirming dietitians and trainers to help them improve cardiovascular health through a multimodal human-centered approach.

It is also worth noting that a significant self-perpetuating gap exists in the literature evaluating outcomes for several GAS procedures. In studies not specifically designed to evaluate BMI as a risk factor for complications, TGNC patients with higher BMI are excluded, as they are deemed surgically unfit by institutional or surgeon-specific protocols.[35] In addition, arbitrary BMI requirements for surgery may disproportionately affect patients seeking GAS even when analogous procedures are performed in cisgender patients for cosmesis.[26] As the benefits of GAS are substantial and well described, further research is needed to identify more specific predictors of surgical risk in this understudied population to improve safety outcomes and maximize access to essential procedures for the TGNC community. Research and clinical practice are hindered by continued reliance on BMI as a requirement for GAS candidacy.

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References

1. Coleman E, Bockting W, Botzer M, et al. The Standards of Care of the World Professional Association for Transgender Health, 7th version. Int J Transgenderism. 2011;13:165–232.
2. Beth Israel Deaconess Medical Center. (2020, June 23). Gender Affirming Surgery Services. https://www.bidmc.org/centers-and-departments/plastic-and-reconstructive-surgery/our-services/gender-affirming-surgery Accessed August 4, 2020.
3. Blue Cross Blue Shield Medical Policy. (2018, July 1). BSC7.02 Gender Reassignment Surgery. 1. https://www.blueshieldca.com/provider/content_assets/documents/download/public/bscpolicy/Gender_RA_Surg.pdf Accessed August 4, 2020.
4. Martinson TG, Ramachandran S, Lindner R, et al. High body mass index is a significant barrier to gender-confirmation surgery for transgender and gender-nonbinary individuals. Endocr Pract. 2020;26:6–15.
5. Burkhauser RV, Cawley J. Beyond BMI. the value of more accurate measures of fatness and obesity in social science research. J Health Econ. 2008;27:519–529.
6. Carroll JF, Chiapa AL, Rodriquez M, et al. Visceral fat, waist circumference, and BMI: impact of race/ethnicity. Obesity (Silver Spring). 2008;16:600–607.
7. Wang Y, Beydoun MA. The obesity epidemic in the United States—gender, age, socioeconomic, racial/ethnic, and geographic characteristics: a systematic review and meta-regression analysis. Epidemiol Rev. 2007;29:6–28.
8. Klaver M, Dekker MJHJ, de Mutsert R, et al. Cross-sex hormone therapy in transgender persons affects total body weight, body fat and lean body mass: a meta-analysis. Andrologia. 2017;49:e12660.
9. Bishop A, Overcash F, McGuire J, Reicks M. Diet and physical activity behaviors among adolescent transgender students: school survey results. J Adolesc Health. 2020;66:484–490.

10. Diemer EW, Grant JD, Munn-Chernoff MA, et al. Gender identity, sexual orientation, and eating-related pathology in a national sample of college students. J Adolesc Health. 2015;57:144–149.
11. Nobili A, Glazebrook C, Arcelus J. Quality of life of treatment-seeking transgender adults: a systematic review and meta-analysis. Rev Endocr Metab Disord. 2018;19:199–220.
12. Reisner SL, Poteat T, Keatley J, et al. Global health burden and needs of transgender populations: a review. Lancet. 2016;388:412–436.
13. Bailey L, Ellis SJ, McNeil J. Suicide risk in the UK trans population and the role of gender transition in decreasing suicidal ideation and suicide attempt. Mental Health Rev. 2014;19:209.
14. Heylens G, Verroken C, De Cock S, et al. Effects of different steps in gender reassignment therapy on psychopathology: a prospective study of persons with a gender identity disorder. J Sex Med. 2014;11:119–126.
15. Snorton CR. 'A new hope': the psychic life of passing. Hypatia. 2009;24: 77–92.
16. Ejaz A, Spolverato G, Kim Y, et al. Impact of body mass index on perioperative outcomes and survival after resection for gastric cancer. J Surg Res. 2015;195:74–82.
17. Tsai A, Schumann R. Morbid obesity and perioperative complications. Curr Opin Anaesthesiol. 2016;29:103–108.
18. Ottesen TD, Hsiang WR, Malpani R, et al. Underweight patients are the greatest risk body mass index group for 30-day perioperative adverse events after total shoulder arthroplasty. J Am Acad Orthop Surg. 2020 [Epub ahead of print]; DOI:10.5435/JAAOS-D-20-00049
19. Kailas M, Lu HMS, Rothman EF, Safer JD. Prevalence and types of gender-affirming surgery among a sample of transgender endocrinology patients prior to state expansion of insurance coverage. Endocr Pract. 2017;23: 780–786.
20. Horbach SE, Bouman MB, Smit JM, et al. Outcome of vaginoplasty in male-to-female transgenders: a systematic review of surgical techniques. J Sex Med. 2015;12:1499–1512.
21. Gaither TW, Awad MA, Osterberg EC, et al. Postoperative complications following primary penile inversion vaginoplasty among 330 male-to-female transgender patients. J Urol. 2018;199:760–765.
22. Ives GC, Fein LA, Finch L, et al. Evaluation of BMI as a risk factor for complications following gender-affirming penile inversion vaginoplasty. Plast Reconstr Surg Glob Open. 2019;7:e2097.
23. Massie JP, Morrison SD, Van Maasdam J, Satterwhite T. Predictors of patient satisfaction and postoperative complications in penile inversion vaginoplasty. Plast Reconstr Surg. 2018;141:911e–921e.
24. Ascha M, Massie JP, Morrison SD, et al. Outcomes of single stage phalloplasty by pedicled anterolateral thigh flap versus radial forearm free flap in gender confirming surgery. J Urol. 2018;199:206–214.
25. Bretschneider CE, Sheyn D, Pollard R, Ferrando CA. Complication rates and outcomes after hysterectomy in transgender men. Obstet Gynecol. 2018;132:1265–1273.
26. Cuccolo NG, Kang CO, Boskey ER, et al. Mastectomy in transgender and cisgender patients: a comparative analysis of epidemiology and postoperative outcomes. Plast Reconstr Surg Glob Open. 2019;7:e2316.
27. Rothenberg KA, Gologorsky RC, Hojilla JC, Yokoo, KM. Obesity is not associated with complications or revisions after gender-affirming mastectomy in transgender patients. J Am Coll Surg. 2019;229:S225.
28. Cuccolo NG, Kang CO, Boskey ER, et al. Epidemiologic characteristics and postoperative complications following augmentation mammaplasty: comparison of transgender and cisgender females. Plast Reconstr Surg Glob Open. 2019;7:e2461.
29. O'Hara L, Taylor J. What's wrong with the 'war on obesity?': a narrative review of the weight-centered health paradigm and development of the 3C framework to build critical competency for a paradigm shift. Sage Open. 2018;8:2158244018772888.
30. Rothblum ED. Slim chance for permanent weight loss. Arch Sci Psychol. 2018;6:63–39.
31. Tomiyama AJ. Weight stigma is stressful. A review of evidence for the Cyclic Obesity/Weight-Based Stigma model. Appetite. 2014;82:8–15.
32. Vartanian LR, Porter AM. Weight stigma and eating behavior: a review of the literature. Appetite. 2016;102:3–14.
33. Stechmiller JK. Understanding the role of nutrition and wound healing. Nutr Clin Pract. 2010;25:61–68.
34. Malone DL, Genuit T, Tracy JK, et al. Surgical site infections: reanalysis of risk factors. J Surg Res. 2002;103:89–95.
35. Buncamper ME, van der Sluis WB, van der Pas RS, et al. Surgical outcome after penile inversion vaginoplasty: a retrospective study of 475 transgender women. Plast Reconstr Surg. 2016;138:999–1007.

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Abbreviations Used

ASA = American Society of Anesthesiologists
BMI = body mass index
GAS = gender affirmation surgery
TGNC = transgender and gender nonconforming
WPATH = World Professional Association for Transgender Health