

Limited Access to Facial Feminization Geographically Despite Nationwide Expansion of Other Gender-Affirming Surgeries

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Background: Facial feminization surgery (FFS) is an integral aspect of gender-affirming surgery (GAS) for individuals seeking to align secondary sex characteristics and gender identity. Despite the importance of FFS in treating gender dysphoria, current trends and prevalence remain unknown. We sought to examine trends in GAS and FFS and investigate the payer status of facial feminization procedures in the United States.

Methods: Data was extracted from the National Inpatient Sample from 2008 to 2017 by using International Classification of Diseases Ninth or Tenth diagnosis codes for gender identity disorder and procedure codes for FFS.

Results: From 2008 to 2017, 3015 patients underwent GAS. The yearly number of cases increased as did the average cost of GAS, which rose from \$13,657 in 2008 to \$50,789 in 2017. From 2015 to 2017, when FFS data was available, 110 of 1215 (9.1%) GAS patients had FFS. Most were non-Hispanic White (66.7%) or Black (23.8%). Fifty percent of FFS cases occurred in the West, followed by the Northeast (31.8%), South (13.6%), and Midwest (4.8%) ($P = 0.015$). By payer the cases were, 36.4% self-pay, 31.8% Medicaid, and 27.3% private insurance ($P < 0.0001$). Approximately, 18% of patients undergoing male-to-female transition received FFS.

Conclusions: From 2008 to 2017, GAS cases increased nationwide while the average cost of surgery rose steeply. FFS cases were primarily in the Western and Northeast United States. Despite high cost, roughly 18% of transgender women in our sample received FFS, highlighting the importance of FFS in gender transition. (*Plast Reconstr Surg Glob Open* 2022;10:e4521; doi: [10.1097/GOX.0000000000004521](https://doi.org/10.1097/GOX.0000000000004521); Published online 20 September 2022.)

INTRODUCTION

Gender-affirming surgery (GAS) refers to a number of reconstructive procedures that align transgender patients' outward sexual characteristics with their gender identity.¹ Over the past 15 years, the rates of both top (eg, breast augmentation and mastectomy) and bottom (eg, phalloplasty, vaginoplasty, and metoidioplasty) surgeries have

increased dramatically in the United States, resulting in quantifiable improvements in patient self-esteem and reduction in utilization of mental health resources.²⁻⁵

While top and bottom surgeries comprise the majority of GAS procedures, there is little epidemiologic information available on trends in facial feminization surgery (FFS). FFS feminizes masculine facial features in transgender women with procedures impacting the craniofacial skeleton and soft tissue. Although FFS has been described in the literature as early as the 1990s, publications by Teixeira et al⁶ and Morrison et al⁷ suggest a recent increase in demand for facial procedures. To our knowledge, no study has reported data on trends in FFS in the United States or demonstrated trends in cost, payer status, and regional variation in top and bottom gender-affirming procedures since 2015.²

Given the recent increase in demand for gender-affirming care in the United States, there is a need to understand trends in GAS.² In this article, we present

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current trends in top, bottom, and facial gender-affirming procedures in the inpatient setting. We further investigate the role of primary payer status, cost, geographical region, and race in determining patterns of access to GAS.

PATIENTS AND METHODS

Dataset

Data analysis relied on the National Inpatient Sample (NIS), a large publicly available all-payer inpatient care database in the United States. The NIS contains annual data on over seven million hospital stays and estimates over 35 million hospitalizations nationally a year. It was developed via a Federal-State-Industry partnership sponsored by the Agency for Healthcare Research and Quality. This study evaluated 10 years of available NIS data from 2008 to 2017 comprising approximately 80 million hospitalizations.

Data Extraction and Classification

Inpatient data were extracted from NIS for the years 2008–2017. Inclusion criteria selected for patients with International Classification of Diseases Ninth or Tenth (ICD-9/10) diagnostic codes for transgender patients were 30285 (gender identity disorder in adolescents or adults), 3025 (trans-sexualism with unspecified sexual history), 3026 (gender identity disorder in children), F641 (gender identity disorder in adolescence and adulthood), F642 (gender identity disorder of childhood), F648 (other gender identity disorders), and F649 (gender identity disorder, unspecified). ICD-9/10 codes were similarly used to identify patients who had undergone bottom/top surgery as well as facial feminization (see ICD-9/10 tables for classification scheme). Patients classified as having received GAS included any patient who underwent either top surgery, bottom surgery, or both. Our analysis consisted of a weighted dataset of 33,135 patients of whom 3015 underwent GAS.

Statistical Analysis

For continuous variables, outliers were excluded if they were found to be outside the 95th percentile of data points. Patient and hospital characteristics were analyzed using a Student *t* test for continuous variables and a chi-square test for categorical variables, and individual predictor variables were evaluated based on Wald χ^2 statistic. All *P* values within the model were two-tailed. All analysis was conducted using SAS version 9.4.

RESULTS

Trends in Inpatient Top and Bottom Surgical Procedures

Between 2008 and 2017, there were 33,135 hospital discharges with diagnosis codes related to gender dysphoria.

Takeaways

Question: How have trends in gender-affirming surgery (GAS) evolved over the past decade and how common is facial feminization surgery (FFS)?

Findings: Over the time period 2008–2017, annual cases and average cost of GAS increased considerably. Approximately 18% of patients undergoing male-to-female transition received FFS.

Meaning: Numbers of GAS cases are rising in the United States, with expansion of FFS trailing behind other GAS procedures.

Of these, 3015 (9.1%) received one or more top or bottom GAS procedures. The percentage of patients who received top surgery was 3.4%, while 6.8% received bottom surgery (Table 1). An increase in GAS over time was observed between 2008 and 2017 with peaks in 2011 and 2016 (Fig. 1). Median age of patients receiving GAS in 2008 was 21 years old for top surgery and 41 years old for bottom surgery. From 2008 to 2017, the gap between age for top and bottom surgeries narrowed, and the median age of all patients receiving GAS was 31 years old in 2017 (Fig. 2A). Length of stay (LOS) for top and bottom GAS discharges increased from 2008 to 2011, remained stable from 2011 to 2016, and increased in 2017 (Fig. 2B). Median cost of GAS rose from \$13,657 in 2008 to a peak of \$72,640 in 2015, before falling to \$50,789 in 2017 (Fig. 2C). From 2015 to 2017, the average cost of GAS was \$64,102 with top surgery costing an average of \$63,747 and bottom surgery an average of \$65,509 (Table 1).

From 2015 to 2017, private insurance was the primary payer in the majority of all discharges for top and bottom GAS (630; 52.5%), followed by Medicaid (360; 30.0%), self-pay (110; 9.2%), Medicare (70; 6.3%), and other payer (40; 1.7%) (*P* < 0.0001). Percentages by primary payer were similar for top and bottom surgeries (Table 1). From 2011 to 2015, the majority of GAS cases occurred in the Western Region.

Current Trends in Inpatient Facial Feminization Procedures

From 2015 to 2017, 110 out of 1215 (9.1%) discharges for GAS included FFS. Eighteen percent of patients undergoing male-to-female transition received FFS. Most patients receiving FFS were non-Hispanic White by race (70; 66.7%), followed by Black (25; 23.8%), Asian (5; 4.8%), and Native American (5; 4.8%) (*P* = 0.166). Most FFS procedures occurred in the Western Region (55; 50%), followed by the Northeastern Region (35; 31.8%), Southern Region (15; 13.6%), and Midwestern Region (5; 4.8%) (*P* = 0.015). By bed number, 45 (41.0%) FFS procedures occurred in small

Table 1. Primary Payer Status, 2015–2017

Procedure	Average Cost (\$)	Medicare (%)	Medicaid (%)	Private (%)	Self-pay (%)	No Charge (%)	Other (%)	<i>P</i>
All GAS	64,102	75 (6.3)	360 (30.0)	630 (52.5)	110 (9.2)	5 (0.42)	40 (1.7)	<0.0001
Top	63,747	60 (8.5)	195 (27.7)	380 (53.9)	55 (7.8)	5 (0.7)	10 (1.4)	0.0064
Bottom	65,509	30 (5.2)	170 (29.3)	340 (58.62)	35 (6.0)	0 (0)	5 (0.86)	0.0005

Bolded values significant at <0.05.

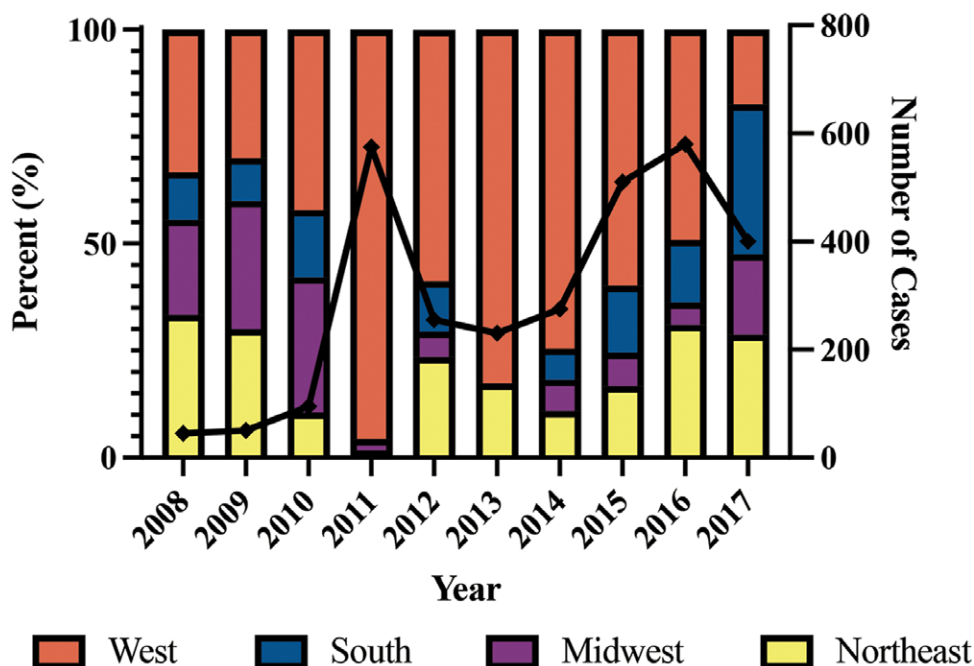


Fig. 1. GAS by region and total cases from 2008 to 2017. Region classification in the NIS database is as follows: Northeast: CT, ME, MA, NH, RI, VT, NJ, NY, and PA; Midwest: IL, IN, MI, OH, WI, IA, KS, MN, MO, NE, ND, and SD; West: AZ, CO, ID, MT, NV, NM, UT, WY, AK, CA, HI, OR, and WA; South: DE, FL, GA, MD, NC, SC, VA, DC, WV, AL, KY, MS, TN, AR, LA, OK, and TX.

hospitals, 40 (36.4%) occurred in medium-sized hospitals, and 25 (22.7%) occurred in large hospitals ($P = 0.016$). By primary payer status, 40 (36.4%) FFS cases were self-pay, 35 (31.8%) were Medicaid, and 30 (27.3%) were paid by private insurance ($P < 0.0001$). Most FFS discharges were from urban nonteaching hospitals (100; 90.9%) ($P = 0.1033$). Forty (36.4%) patients were in the bottom 25th percentile of income, 15 (13.6%) were in the 25th–50th percentile, 20 (18.2%) were in the 51st–75th percentile, and 20 (22.7%) were in the top 25th percentile ($P = 0.440$) (Table 2).

DISCUSSION

We analyzed 10 years of nationally representative data on inpatient GAS and characterized trends in regional variability, procedural cost, and primary payer status. Relative to 2008, our data showed a rising number of gender-affirming top and bottom procedures. This gradual rise in procedures coincides with the increasing number of transgender and gender identity disorder diagnoses from 2000 to 2014. Although GAS before 2010 was largely confined to the Northeastern and Western United States, our findings demonstrate an increase in cases in the South and Midwest by the middle of the decade.^{2,3}

Explanations for the difference in geographic distribution of GAS cannot be explained by population density, as, in 2017, the Northeast and Western regions correlated to 17% and 24% of the US population, respectively.⁶ The basis for this disproportionate distribution of this trend is unknown and may simply reflect the distribution of surgeons experienced in GAS. Additionally, patients often travel to obtain GAS surgery, which would not be accounted for in the NIS database, making the correlation

of region and access difficult. Future trends in geographic distribution should be monitored to clarify the significance of these findings.

Furthermore, most insurance providers in the United States view GAS, in particular FFS, as a cosmetic procedure rather than medically necessary, posing considerable financial burden to the patient.⁷ According to the 2015 US Transgender Survey, more than 55% of those who sought coverage for GAS within the past year were denied care, drastically limiting the number of transgender individuals able to receive FFS.^{8,9} Previous work has identified a steady rise in the cost of GAS from 2008 to 2014.² Our results show that costs for these procedures have dropped and stabilized since peaking in 2014. The cause of these observable shifts in cost is likely multifactorial in nature. One factor that may contribute to regional expansion and cost stabilization of GAS nationwide is the enactment of the Affordable Care Act and recent state policy changes banning discrimination in insurance coverage on the basis of sex or gender identity.^{10,11} Expansion of the Affordable Care Act and increased private insurance coverage for top and bottom GASs is likely an important factor contributing to improved accessibility to gender-affirming care. Our data from 2015 to 2017 show that only 9.2% of patients receiving top or bottom GAS were self-pay compared with 14.1% at the beginning of the decade.²

Interestingly, the steep rise in surgical costs for top and bottom procedures between 2008 and 2016 was correlated with an increase in these cases. This surge in cost may reflect growing demand for GAS or widened insurance coverage driving billing practices.¹² Insurance coverage for FFS has lagged behind other gender-affirming

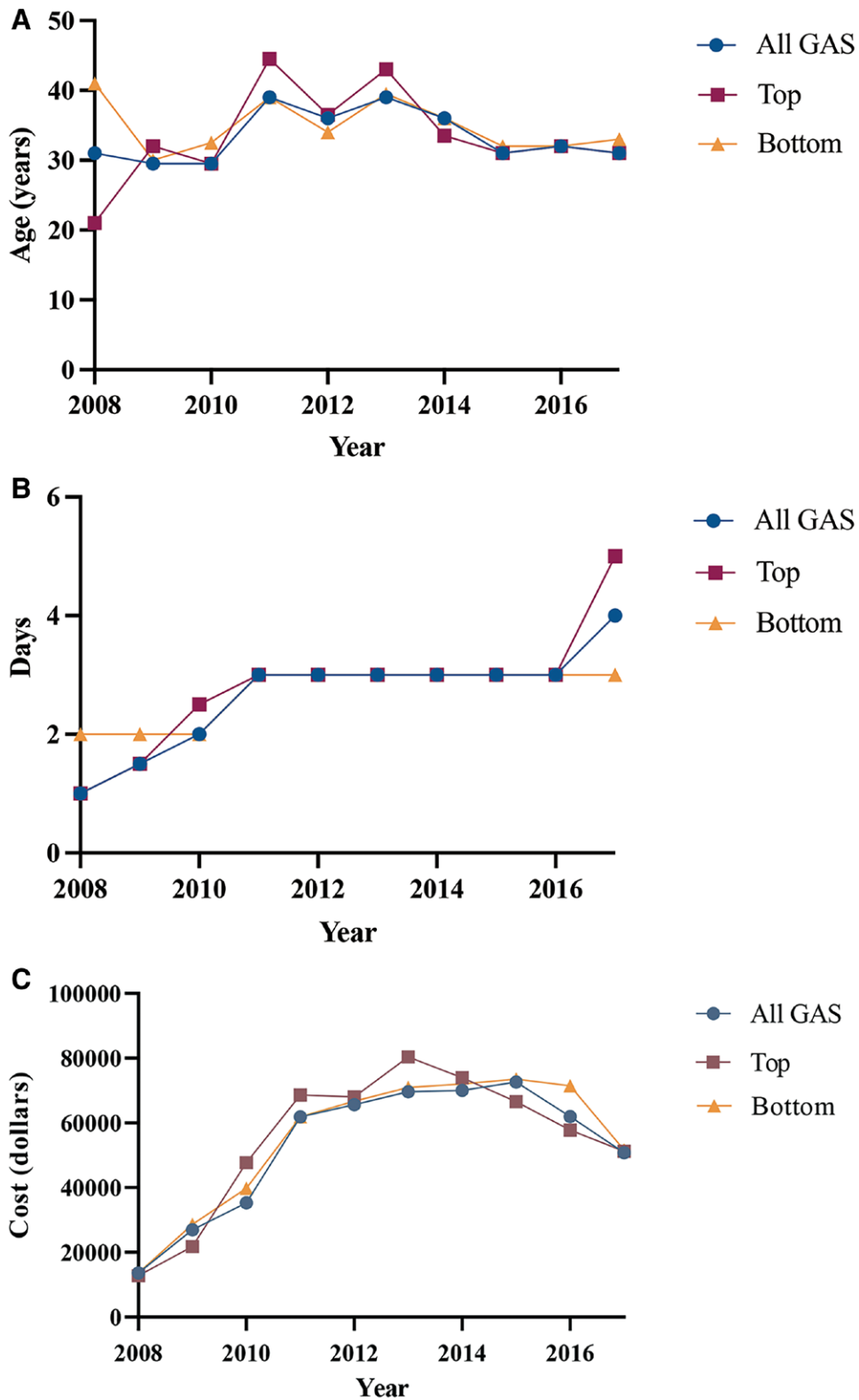


Fig. 2. General characteristics of GAS from 2008-2017. A, Median age in GAS patients. B, LOS following GAS. C, Median cost of GAS between 2008 and 2017.

care. In 2020, 18 state Medicaid programs offered some gender-affirming care but only three covered FFS.⁷ Current trends in FFS may be more heavily influenced by the availability of trained surgeons than top and bottom

surgeries. Future work will examine whether FFS will follow upward trends of top and bottom surgeries as more surgeons are trained in gender-affirming procedures, and state and national policies become more inclusive of FFS.

Table 2. Facial Feminization Demographics

Variable	% (N = 110)	P
No. procedures (median)	5	
Cost (mean), \$	89,176	
Race		
White	66.67 (70)	0.1658
Black	23.81 (25)	
Hispanic	*	
Asian	4.76 (5)	
Native American	4.76 (5)	
Region		
North-East	31.82 (35)	0.0146
Midwest	4.55 (5)	
South	13.64 (15)	
West	50 (55)	
Hospital size		
Small	40.96 (45)	0.0164
Medium	36.36 (40)	
Large	22.73 (25)	
Primary payer		
Medicare	*	<0.0001
Medicaid	31.82 (35)	
Private	27.27 (30)	
Self	36.36 (40)	
Other	4.55 (5)	
Location/teaching status		
Rural	*	0.1033
Urban teaching	9.09 (10)	
Urban nonteaching	90.91 (100)	
Income status		
Lower 25%	40.00 (40)	0.4398
26%–50%	15 (15)	
51%–75%	20 (20)	
Top 25%	25 (25)	

*Unable to report due to insufficient sample size.
 Bolded values significant at <0.05.

This study is the first to examine trends in inpatient FFS in the United States. FFS data were studied for the 2015–2017 period as it provided maximal granularity for facial feminization after adoption of ICD-10 coding in 2015.¹³ Notably, 18% of transgender women in our GAS sample received FFS. This finding suggests substantial patient demand for FFS and highlights the important role it plays in gender affirmation. Alignment of secondary sex characteristics and gender identity is associated with significant decreases in mental health sequelae like depression and anxiety in the transgender population.^{9,14} Despite top and bottom surgeries remaining more common than FFS, some surgeons and psychologists assert that facial feminization is the most essential component of gender-affirmation surgery. This is likely because the face is a powerful, outward-facing signifier of gender and is often the most noticeable part of the human body.^{15,16}

Although the benefits to patient quality of life and self-esteem from FFS are substantial,^{17–20} it remains more regionally limited than other GAS with over 80% of procedures occurring in the Western and Northeastern United States. This trend may be due to a greater density of surgeons with experience in FFS in these regions or wider insurance coverage.^{2,3} Absence of insurance coverage remains a barrier to care for transgender individuals seeking GAS, especially FFS.²¹ Between the dates covered in this study, state Medicaid policies on GAS varied considerably, with only three states (Connecticut, Massachusetts, and Washington) guaranteeing “extensive” FFS coverage without a case-by-case clause.⁷ Other states including California, Oregon, and Maryland

cover FFS either on a case-by-case basis or cover only specified procedures, making access in these states fall below the “extensive” coverage defined by Gorbea et al.^{7,18} More recently, the Centers for Medicaid and Medicare Services approved expansion of Colorado’s Essential Health Benefits plan to require all individual and small group health insurers cover FFS including jaw, cheek, and eye modifications, face tightening, and facial bone remodeling starting in 2023.²² Future studies are necessary to understand the impact of this and other policy measures on access to FFS. Most large commercial insurers tend to submit policies consistent with their state legal precedent.¹¹ Consistent with this, regions with less legal support for transgender individuals comprised a smaller fraction of FFS cases in our study.

Our study has several limitations inherent to the use of the NIS database. First, the NIS database is limited to the inpatient setting. Ambulatory procedures are not included, and our sample, therefore, may fail to capture the full range of GAS and FFS. Future work must be undertaken to characterize trends in outpatient procedures. Additionally, the increase in average LOS noted in our study likely misrepresents the true incidence of perioperative/postoperative surgical complications contributing to the increasing LOS. As GAS gains in popularity, many surgeons are becoming more comfortable performing both top and bottom surgeries on an outpatient basis, biasing the NIS sample by including a higher proportion of medically complex patients requiring inpatient stays. This study does not support the claim that the surgical complication rate or medical comorbidities in patients seeking GAS has changed significantly over this 10-year period. Second, we relied on the use of ICD-9 and ICD-10 diagnosis codes for diagnosis. Use of ICD-9/10 coding is a widely accepted limitation of administrative claims databases due to differences in patient reporting and coding across hospitals.²³ Furthermore, because the NIS is deidentified, it is not possible to verify diagnosis codes with patients’ self-identity as transgender. Finally, our analysis ended in 2017 and does not capture changes that may have occurred more recently.

CONCLUSIONS

Relative to the early part of the decade, GAS has become an increasing popular option among transgender individuals seeking to align their outward appearance with their gender identity. The last 10 years in the United States have seen major shifts in trends associated with gender-affirming care. In line with expanded federal state insurance coverage, we found that top and bottom GAS has undergone a nationwide expansion. However, FFS lacks adequate insurance coverage and remains geographically limited to the Northeast and Western United States.

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