

Cosmetic Surgery Training in Plastic Surgery Residency Programs

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Background: Over the past decade, plastic surgery programs have continued to evolve with the addition of 1 year of training, increase in the minimum number of required aesthetic cases, and the gradual replacement of independent positions with integrated ones. To evaluate the impact of these changes on aesthetic training, a survey was sent to residents and program directors.

Methods: A 37 question survey was sent to plastic surgery residents at all Accreditation Council for Graduate Medical Education–approved plastic surgery training programs in the United States. A 13 question survey was sent to the program directors at the same institutions. Both surveys were analyzed to determine the duration of training and comfort level with cosmetic procedures.

Results: Eighty-three residents (10%) and 11 program directors (11%) completed the survey. Ninety-four percentage of residents had a dedicated cosmetic surgery rotation (an increase from 68% in 2015) in addition to a resident cosmetic clinic. Twenty percentage of senior residents felt they would need an aesthetic surgery fellowship to practice cosmetic surgery compared with 31% in 2015. Integrated chief residents were more comfortable performing cosmetic surgery cases compared with independent chief residents. Senior residents continue to have poor confidence with facial aesthetic and body contouring procedures.

Conclusions: There is an increase in dedicated cosmetic surgery rotations and fewer residents believe they need a fellowship to practice cosmetic surgery. However, the comfort level of performing facial aesthetic and body contouring procedures remains low particularly among independent residents. (*Plast Reconstr Surg Glob Open* 2017;5:e1491; doi: 10.1097/GOX.0000000000001491; Published online 26 September 2017.)

INTRODUCTION

Over the past 7 years, plastic surgery programs have continued to evolve. Currently, there are 2 pathways accredited for plastic surgery training. These include the integrated and independent pathways. Overall, independent positions are decreasing as they are replaced with integrated ones. There are currently 96 institutions offering integrated and/or independent plastic surgery training. The independent pathway is mandated at 3 years since 2011, whereas the integrated pathway is 6 years ± a

research year.¹ As these programs continue to grow and develop their curriculum, it is important that we ensure the quality of training in each aspect of plastic surgery to not be compromised.

Training in cosmetic surgery is especially challenging to implement for many programs due to the lack of patient volume or staff support to train residents.²⁻⁵ Furthermore, many residents do not get aesthetic exposure until the end of their training. Even in the senior levels [postgraduate year (PGY) 5 and PGY6], the exposure to cosmetic surgery is limited with regard to the breadth of procedures performed and the time spent on dedicated cosmetic surgery rotations.^{2,3} The risk of not training residents well not only affects the ability of their future practice and safety of patients but also the reputation of our specialty. Cosmetic surgery is becoming an integral part of many other specialties (physicians and nonphysicians);

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therefore, it is important that plastic surgeons remain at the forefront of this practice by ensuring that residents are competent, confident, and interested in performing aesthetic procedures upon graduation.^{6,7}

Previous studies analyzing the quality of aesthetic surgery training have shown deficits in training satisfaction and low confidence in performing common cosmetic procedures upon graduation.^{2,3,8,9} This is not only limited to the United States but also Europe and Canada.^{4,10} More specifically, in 2006, a survey by Morrison et al.³ determined that 76% of program directors felt that senior residents were satisfied while only 51% of residents admitted to being satisfied with their cosmetic training. Additionally, over one-third of the graduating residents claimed they needed an aesthetic fellowship to feel comfortable performing cosmetic surgery.^{3,8} A follow-up survey by Oni et al.² in 2009 and Hashem et al.⁹ in 2015 revealed an increase in satisfaction by residents, a decrease in number requiring an aesthetic fellowship, and an increase in number of residency clinics per program directors. Since 2009, several major changes have occurred in plastic surgery training. These include increasing training time for both integrated and independent residents by 1 year, requiring completion of a full surgical residency for independent residents and increasing the minimum required aesthetic cases from 55 to 150.^{1,11} This study aims to evaluate the impact of these changes on resident cosmetic training as well as to identify areas of improvement. Furthermore, we explore how differences in training pathways (integrated versus independent), PGY level, and region affect comfort in cosmetic surgery.

METHODS

In September 2016, a 37 question survey, developed using SurveyMonkey (Palo Alto, Calif.) was sent to residents at all Accreditation Council for Graduate Medical Education (ACGME)-approved plastic surgery programs (72 integrated and 66 independent programs; see appendix, Supplemental Digital Content 1, which displays the resident cosmetic survey, <http://links.lww.com/PRSGO/A552>). A separate survey with 13 questions was sent to the program directors (96 in total) at the same institutions to determine if there was a difference in the perception of cosmetic training. Due to privacy restrictions on obtaining individual e-mail addresses, the link to the survey was sent to the residents via their respective program coordinators. Based on National Residency Match Program and San Francisco Match data, we estimate 921 residents were contacted. Responses were collected for a 1-month period. During this time, 2 reminder e-mails were sent in addition to offering a \$200 gift card as a raffle to incentivize completion.

The resident survey was formatted to differentiate between integrated and independent residents along with their respective PGY. The remainder of the survey was designed to understand the general interest in cosmetic surgery, duration of aesthetic training at each PGY level, desire to complete an aesthetic fellowship, the comfort level of frequently performed cosmetic procedures, and region of training. The program director survey was aimed at evaluating how much time was spent during each

PGY level on cosmetic rotations. Furthermore, details on cosmetic clinic and confidence levels of resident performance were obtained to determine if residents are able to perform cosmetic surgery satisfactorily upon graduation.

Data from both surveys were analyzed using SPSS (IBM, Armonk, N.Y.). Results were also compared to the most recent cosmetic surgery survey completed by Hashem et al.⁹ to determine differences in cosmetic training over the previous year. Categorical variables were analyzed using Pearson’s chi-square test and Fisher’s exact test, whereas continuous variables were examined using the unpaired Student’s *t* test and Mann-Whitney *U* test. A *P* value of less than 0.05 was considered statistically significant.

RESULTS

A total of 83 residents (10%) across all levels of training (representing 20 institutions across the United States) and 11 program directors (11%) responded.

Program Director Survey

The program directors represented independent (18%), integrated (36%), and combined (both independent and integrated; 46%) programs. Nearly all programs (91%) offered a dedicated cosmetic surgery rotation, and 89% offered a resident cosmetic clinic. Of the programs that offered a resident cosmetic clinic, 14% performed 5–10 cases, 57% performed 10–15 cases, and 29% performed 16–20 cases. Program directors were least confident with blepharoplasty (63%), face lift (50%), brow lift (50%), rhinoplasty (50%), laser (50%), and buttock augmentation (25%). In comparison with resident responses, program directors had higher confidence in the ability of residents to perform breast augmentation (100% versus 77%; *P* = 0.03), brachioplasty (100% versus 58%; *P* < 0.01), body lift (100% versus 58%; *P* < 0.01), and buttock augmentation (25% versus 12%; *P* = 0.03; Table 1). Three-fourths of program directors believed that their graduating residents did not require extra cosmetic training if they are interested in having a cosmetic practice.

Table 1. Percentage of Program Directors and Senior Residents Who are Confident in Performing Cosmetic Procedures

Cosmetic Procedures	Program Director (n = 11; %)	Senior Residents (n = 26; %)	<i>P</i>
Facelift	50	35	0.15
Blepharoplasty	63	73	0.95
Brow lift	50	35	0.33
Rhinoplasty	50	38	0.21
Breast augmentation	100	77	0.03*
Mastopexy	88	77	0.27
Abdominoplasty	100	92	0.16
Brachioplasty	100	58	0.01*
Body lift	100	58	0.01*
Thighplasty	75	58	0.20
Buttock augmentation	25	12	0.03*
Botulinum toxin/fillers	100	89	0.16
Liposuction	100	96	0.32
Aesthetic laser therapy	50	65	0.64

**P* < 0.05 considered significant.

Table 2. Percentage of Residents Who are Confident in Performing Common Cosmetic Procedures

	Junior (n = 27; %)	Mid-level (n = 28; %)	Senior (n = 26; %)	Chief (n = 11; %)
Facelift	0	10	35	56
Blepharoplasty	7	33	73	67
Brow lift	7	10	35	56
Rhinoplasty	0	10	38	56
Breast augmentation	19	53	77	67
Mastopexy	15	47	77	89
Abdominoplasty	22	47	92	89
Brachioplasty	0	37	58	67
Body lift	0	17	58	56
Thighplasty	0	33	58	67
Buttock augmentation	0	7	12	11
Botulinum toxin/fillers	26	63	89	89
Liposuction	33	77	96	89
Aesthetic laser therapy	22	40	65	78

Resident Survey

Of the 83 resident respondents, there were 27 junior (PGY1 and 2), 28 mid-level (PGY3 and 4), and 26 senior (PGY5 and 6+) residents. As a subset of the senior residents, there were 11 chief residents (PGY6 for integrated and PGY8 for independent) who were also analyzed separately.

The average time spent on dedicated cosmetic surgery rotations was less than 3 months among junior and mid-level residents and 3–6 months for senior level residents. Among the seniors, 57% had spent less than 3 months on cosmetic surgery, 23% for 3–6 months, and 19% more than 6 months. The lowest interest in cosmetic surgery was among the mid-levels (42%), whereas the highest was among the graduating chief residents (56%).

Nearly all residents (96%) reported having a dedicated cosmetic surgery rotation. Eighty-one percentage of residents rotated in a private practice setting, and 53% participated in a resident cosmetic clinic where they were the primary surgeon doing > 50% of the case. The private practice setting would include a rotation in which an adjunct faculty member who was primarily in private practice within the community would host a resident to work directly with him/her in his/her office and operating room. The resident cosmetic clinic would typically be staffed by an attending at their institution to supervise their work; however, this may not have been a full time aesthetic surgeon since it is often difficult to have a majority cosmetic practice in the academic setting. Therefore, the quality of

this experience and training is not standardized or uniform despite the advantages of increased autonomy and “independent” cases. Face lifts, blepharoplasty, breast augmentation, mastopexy, abdominoplasty, botox, and liposuction were performed by all residents who participated in a cosmetic clinic. However, buttock augmentation, lasers, and chemical peels were performed by only 43%.

Table 2 summarizes the comfort level of residents to perform ACGME required and additional common cosmetic procedures at each training level (junior, mid-level, senior, and chief). There is typically an increase in comfort for each cosmetic procedure with increasing training level. At the chief level, the highest comfort levels were seen with liposuction, abdominoplasty, Botox, fillers, and mastopexy with nearly 90% of chief residents feeling comfortable with these procedures. Chief residents were far less comfortable with performing buttock augmentation (11%) and invasive facial aesthetic procedures (56–67%). The majority of chief residents reported only performing an average of 1–5 cases for most facial aesthetic procedures with the exception of blepharoplasty (5–10). Most chief residents never performed a buttock augmentation (Table 3).

Independent Versus Integrated Residents

Of the 83 resident respondents, 84% were integrated and 16% were independent. Independent residents when compared with their integrated counterparts (PGY 4, 5, and 6) differed in several aspects. Independent residents

Table 3. Average Number of Procedures Assisted and Performed as Reported by Chief Residents

	ACGME Minimum Requirement	Average No. Procedures Assisted	Average No. Procedures Performed
Facelift	10	5–10	1–5
Blepharoplasty	20	5–10	5–10
Brow lift	2	1–5	1–5
Rhinoplasty	10	5–10	1–5
Breast augmentation	16	5–10	5–10
Mastopexy	12	5–10	5–10
Abdominoplasty	10	5–10	10–20
Brachioplasty	2	1–5	1–5
Body lift	2	1–5	1–5
Thighplasty	2	1–5	1–5
Buttock augmentation	0	0	0
Botulinum toxin/fillers	7/7	1–5	5–10
Liposuction	15	5–10	5–10
Aesthetic laser therapy	5	1–5	1–5

Table 4. Percentage of Integrated Versus Independent Residents Who are Confident in Performing Common Cosmetic Procedures

	Integrated Residents (PGY4, 5, 6; n = 31; %)	Independent Residents (n = 13; %)	P	Integrated Chief Residents (n = 5; %)	Independent Chief Residents (n = 4; %)	P
Facelift	26	23	0.85	100	0	< 0.01*
Blepharoplasty	61	62	0.99	100	25	0.03*
Brow lift	29	38	0.55	80	25	0.12
Rhinoplasty	29	37	0.69	100	0	< 0.01*
Breast augmentation	64	54	0.52	100	25	0.03*
Mastopexy	71	62	0.55	100	75	0.26
Abdominoplasty	77	85	0.60	100	75	0.26
Brachioplasty	55	38	0.33	100	25	0.03*
Body lift	45	46	0.95	60	50	0.78
Thighplasty	55	38	0.33	100	25	0.025*
Buttock augmentation	16	0	0.13	20	0	0.37
Botulinum toxin/fillers	84	69	0.28	100	75	0.26
Liposuction	87	92	0.63	100	75	0.26
Aesthetic laser therapy	65	46	0.27	100	50	0.09

*P < 0.05 considered significant.

on average spent less than 3 months on dedicated cosmetic surgery rotations compared with 3–6 months by the integrated residents. Although not statistically significant, our data trend shows that independent residents were more interested in cosmetic surgery (46%) compared with integrated residents (35%; $P = 0.52$). Of those interested in cosmetic surgery, independent residents were more likely to feel that they require additional training in cosmetic surgery after graduation (33% versus 9%; $P = 0.24$). The confidence in performing common aesthetic procedures was similar between integrated and independent residents (Table 4). However, when comparing just the chief residents, integrated chiefs were more comfortable performing face lifts (100% versus 0%), blepharoplasty (100% versus 25%), rhinoplasty (100% versus 0%), breast augmentation (100% versus 25%), brachioplasty (100% versus 25%), and thighplasty (100% versus 25%; Table 4).

Regional Comparison

To analyze how training can vary across the United States, we grouped states into 9 regions. There were 14 residents from Northwest, 14 from West, 8 from Southwest, 11 from North Central, 11 from South Central, 9 from Great Lakes, 9 from Southeast, 6 from Mid-Atlantic, and 1 from Northeast. The Northeast was excluded from comparison

due to an $n = 1$. Table 5 shows the breakdown of each region’s comfort level for different cosmetic cases. The only 2 procedures that had statistically significant variance across the board are brow lift and buttock augmentation. The regions with the longest amount of time on average spent training cosmetic surgery are the North and South Central regions. The region with the most interest in performing aesthetic surgery upon graduation is the Southeast closely followed by South Central, whereas the West region reports the highest percentage of residents feeling the need to complete an extra year of cosmetic training. Overall, the South Central and Mid-Atlantic regions train residents with the most procedures receiving the highest percentage of comfort level.

DISCUSSION

Aesthetic surgery is one of the foundations of plastic surgery and also one of the most difficult to master. As the majority of cosmetic surgery cases are performed in a private practice setting and resident exposure to aesthetic cases is limited, training can be challenging.²⁻⁵ For most aesthetic procedures, the program directors’ perception of resident comfort was higher than the residents themselves. Since 2009, there has been an increase in training

Table 5. Regional Comfort Level Percentage Chart

	Northwest	West	Southwest	North Central	South Central	Great Lakes	Mid-Atlantic	Southeast	P
No. respondents	14	14	8	11	11	9	6	9	
Facelift (%)	7.1	7.1	25.0	36.4*	18.2	11.1	16.7	0.0	0.345
Blepharoplasty (%)	14.3	57.1*	50.0	45.5	45.5	55.6	50.0	22.2	0.303
Brow lift (%)	0.0	0.0	0.0	55.6*	36.4	33.3	33.0	0.0	0.003†
Rhinoplasty (%)	7.1	14.3	0.0	55.6*	18.2	11.1	33.0	0.0	0.077
Breast augmentation (%)	50.0	35.7	25.0	55.6	63.6*	55.6	50.0	44.4	0.796
Mastopexy (%)	42.9	35.7	25.0	36.4	63.6	55.6	83.3*	44.4	0.373
Abdominoplasty (%)	50.0	57.1	37.5	36.4	72.7	55.6	83.3*	55.6	0.535
Brachioplasty (%)	21.4	21.4	12.5	36.4	63.6*	44.4	33.3	33.3	0.292
Body lift (%)	14.3	14.3	0.0	33.3	45.5	33.3	50.0*	22.2	0.227
Thighplasty (%)	35.7	14.3	0.0	36.4	54.5*	33.3	33.0	22.2	0.245
Buttock augmentation (%)	0.0	0.0	0.0	0.0	36.4*	11.1	0.0	0.0	0.003†
Botox and fillers (%)	42.9	50.0	75.0	63.6	72.7	66.7	83.3*	44.4	0.508
Liposuction (%)	64.3	64.3	50.0	54.5	81.8	77.8	83.3*	66.7	0.756
Laser/noninvasive (%)	35.7	42.9	25.0	45.5	72.7*	55.6	50.0	11.1	0.2

Northeast omitted due to only 1 respondent.

*Values are highest reported for each procedure.

†P value < 0.05 is considered significant.

by 1 year as well as an increase in the minimum required ACGME cosmetic cases: breast augmentation (16 versus 10), abdominoplasty (10 versus 5), blepharoplasty (20 versus 8), face lift (10 versus 7), rhinoplasty (10 versus 6), and liposuction (15 versus 10). In addition, body lift ($n = 2$), thighplasty ($n = 2$), brachioplasty ($n = 2$), mastopexy ($n = 12$), brow lift ($n = 2$), botox/fillers ($n = 7/7$) have been added as required cases.¹¹

Compared with the 2015 study, our survey had a comparable portion of independent residents (64%).⁹ In 2006, there were 94 independent and 84 integrated positions compared with 70 independent and 152 integrated positions offered in 2016.^{12,13} More residents now have a designated cosmetic surgery rotation (96% versus 68%); however, the average duration spent on cosmetic surgery during training remains at 3–6 months. In our survey, the majority of residents performed 10–15 cases during resident cosmetic clinic as opposed to > 20 cases in 2009. Thus, although more residents have a dedicated cosmetic surgery rotation, the actual time spent performing cosmetic surgery has not increased. This suggests that the case minimum requirement increase was not sufficient enough to require additional time devoted to cosmetic surgery resulting in no improvement in the comfort level among residents.

The comfort of residents with aesthetic surgery has improved in our survey with regard to a decrease in senior residents who feel they need an aesthetic fellowship to practice cosmetic surgery (20% versus 32%).² This improvement could be due to the addition of an extra year of training or fewer residents interested in having a primarily cosmetic practice. Since residency training has earlier and longer exposure to hand, microsurgery, craniofacial, and general reconstructive procedures, it appears that residents have chosen to incorporate these aspects into their practice more so than cosmetic surgery. An alternative hypothesis is that residents do not want to do 1 more year of training after an already extended residency since 2011 in both independent and integrated tracks.

The comfort level of residents performing individual ACGME required cases is similar and has not dramatically improved compared with the 2009 survey despite the increase in the minimum number of ACGME required cases. Our results are comparable with those reported by Hesham in 2015; however, this study was limited to residents who were members of the American Society for Aesthetic Plastic Surgery and did not include evaluation of buttock augmentation, liposuction, botox/fillers, and laser therapy.⁹ As with prior surveys, residents have the lowest confidence with facial procedures (face lift, rhinoplasty, and brow lift) with just over 50% of senior residents being comfortable performing these procedures.^{2,3,9} However, when distinguishing between independent chief residents and integrated chief residents, 100% of the integrated chief residents were comfortable in all procedures except (brow lift 80%, body lift 60%, and buttock lift 20%). Although exposure to cosmetic surgery in the junior and mid-level residents was small (1–3 months), the early exposure to aesthetic surgery could have had a large impact on comfort levels during the senior years. The discrepancy in comfort level between integrated and inde-

pendent chief residents is suggestive that earlier exposure to cosmetic surgery leads to higher comfort levels by the time of graduation.

As with all surgical training, more autonomy and case volume increases a resident's competency and comfort level with procedures. An article by Fillmore et al.¹⁴ showed that there is an association between resident's surgical case experience including exposure and autonomy with the resident's future plans for practice and confidence. Our survey revealed that residents just meet their ACGME requirements for cosmetic cases (Table 3), and despite most having a devoted cosmetic clinic, only 10–15 cases are performed on average during this time with significant variability among each resident's experience.¹⁵ Although this case volume may be adequate for some, it is important to realize that a large amount of residents, especially independent residents, remain uncomfortable with basic cosmetic procedures requiring further training to practice aesthetic surgery. When comparing comfort levels across the United States, there does not appear to be much variation. Only 2 of the procedures analyzed were significantly different (brow lift and buttock augmentation); however, trends were noticed in which the South Central and Mid-Atlantic regions seemed to have higher comfort levels.

To improve resident comfort with aesthetic surgery, we suggest several changes to training. First, residents should be exposed to aesthetic surgery as early as possible during training even though they may not be performing the case. Earlier exposure to cosmetic surgery should also increase familiarity and interest in this aspect of plastic surgery. As shown by our data, integrated chief residents are much more comfortable with aesthetic procedures compared with their independent colleagues. This is likely due to their increased exposure to aesthetic training during their junior years. Since 2011, independent residents have been required to complete a full surgical residency; thus, their basic surgical skills are well developed and not likely the source of discomfort. Rather, they lack the early exposure to aesthetic cases that integrated residents receive even though it may be in an informal manner. Second, we suggest increasing the emphasis on body contouring procedures and facial cosmetic procedures, particularly face lift, rhinoplasty, and brow lift. With increasing rates of bariatric surgery, more patients are seeking body contouring procedures.^{16,17} Although residents are comfortable performing abdominoplasty and mastopexy, the comfort levels of body lift, thighplasty, brachioplasty, and most notably buttock augmentation remain low. Facial procedures and breast augmentation have always been some of the most common cosmetic procedures; however, residents consistently report low comfort levels.¹⁸ Although early exposure is important, the type of cases residents are exposed to should be considered. We recommend reassessment of the aesthetic rotation and yearly distribution of pertinent cosmetic cases in relation to resident comfort levels. Lastly, training programs should be encouraged to offer residents opportunities to perform these cases in a low stakes environment such as in cadaver dissection modules.

Although several interesting observations have been made by our survey, it is important to acknowledge its low

response rate. Because individual resident e-mails are no longer available, the surveys had to be distributed by each program coordinator. The low response rate may be in part by this middle party requirement. Nevertheless, efforts should still be made to evaluate resident perception of aesthetic training. In the future, the collection period could be extended beyond 1 month, and payment to each resident may increase response rates. Additionally, self-reported comfort levels can be affected by subjective notions of what it means to be “comfortable” with a procedure limiting the validity of this assessment. With this study, we hope to shed light that while some improvements have been made in cosmetic surgery training with the recent changes in training, certain aspects in aesthetic training need further enhancement.

CONCLUSIONS

Since increasing training by 1 year and increasing the minimum number of required cosmetic surgery cases, fewer residents require a fellowship to practice cosmetic surgery; however, the comfort level of performing facial aesthetic and body contouring procedures remains low particularly among independent residents. Early exposure to aesthetic surgery could explain why integrated residents are more comfortable compared with their independent counterpart and is suggestive that more emphasis should be placed on aesthetic surgery from the start of plastic surgery training.

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