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Longitudinal Assessment of Aesthetic Plastic Surgery Training in the United States: The Effect of Increased ACGME Case Log Minimum Requirements

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Abstract

Background: In 2014, the Accreditation Council for Graduate Medical Education (ACGME) increased the minimum required aesthetic surgery cases for graduation from plastic surgery residency from 50 to 150. To date, there has been no research into how this has impacted resident aesthetic surgery training focusing on the resident perception.

Objective: We sought to evaluate resident perception and satisfaction with their aesthetic surgery training before and after the ACGME case log requirement increase to assess its impact on training and comfort level.

Methods: A survey was administered to all graduating senior residents attending the Senior Residents Conference of the ASPS Annual Meeting in 2014 and 2017. The survey evaluated senior resident aesthetic surgery experience and their confidence and satisfaction with their training.

Results: The response rate was 70% in 2014 and 45% in 2017. There was an increase in the number of programs with resident-run cosmetic clinics (14% increase) and designated aesthetic rotations (33% increase) during that time. Resident-run cosmetic clinics were consistently considered the most valuable form of aesthetic training for residents. There also was a substantial increase in the percentage of residents feeling prepared to incorporate aesthetic surgery into their practice after graduation, increasing from 36% to 59% in 2017. The majority of responding residents felt that the ACGME case log requirement increase in 2014 was beneficial for their aesthetic surgery training (68%).

Conclusions: The recent ACGME case log requirement increase for aesthetic surgery training has had a positive effect on resident comfort with aesthetic procedures and their ability to incorporate them into future practice.

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According to the Cosmetic Surgery National Data Bank Statistics, the total number of aesthetic plastic surgery procedures performed in the United States has increased since 1997 by 99%.[1] Additionally, the American Society of Plastic Surgeons (ASPS) Plastic Surgery Statistics Report demonstrates a 132% increase in cosmetic procedures from 2000 to 2016, for a current total of over 17 million procedures.[2] The most substantial increase was in nonsurgical cosmetic procedures, particularly botulinum toxin injections, soft tissue filler injection, and laser resurfacing, with surgical procedures decreasing by 6% in the same time frame.[2] As public demand continues to increase, it is necessary to evaluate the experience and comfort level of graduating plastic surgery residents in their ability to

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perform the broad spectrum of aesthetic plastic surgery procedures. This is particularly important, given the recent changes to the minimum requirements for graduation from the Accreditation Council for Graduate Medical Education (ACGME).

Previous literature on the evaluation of the aesthetic component of plastic surgery residency training is scant and appears mostly from Germany, Canada, and the United States.[3–7] Many of these previous studies demonstrated a deficiency in aesthetic plastic surgery training during residency, and a low level of resident satisfaction with the aesthetic surgical experience. In 2008, Morrison et al conducted a survey to evaluate the experience of U.S. senior plastic surgery residents, demonstrating that senior residents felt deficient in facial cosmetic, minimally invasive, and recently developed body contouring techniques.[3] In 2011, Oni et al performed a survey to analyze the experience of aesthetic surgery training in plastic surgery programs across the United States and found that only 55.7% of residents felt comfortable integrating aesthetic surgery into their practice, and one third of residents reported that they would apply for a cosmetic fellowship.[4] In 2013, Chivers et al evaluated plastic surgery residency training programs in Canada and found that residents considered facial cosmetic surgery to be more challenging.[5] In 2014, Momeni et al compared the aesthetic surgery training during residency in the United States among integrated, combined, and independent training models. They concluded that the weaknesses in aesthetic training still exist across all training models.[6] Silvestre et al reached a similar conclusion in 2017, demonstrating that there is significant variability in aesthetic training across plastic surgery training programs.[7]

Given these consistent findings of resident discomfort with their aesthetic surgery training, in 2014, the ACGME increased the minimum number of aesthetic cases from 50 to 150 in an effort to improve resident comfort with aesthetic surgery and procedures. Prior to the increase, the only specifically required procedures were: abdominoplasty, liposuction, facelift, blepharoplasty, rhinoplasty, and breast augmentation, for a global total of 50. After the change, nearly all major aesthetic procedures had a specific requirement, for a global total of 150 cases. While the ACGME did also create a requirement for injectable aesthetic treatments (eg, botulinum toxin and dermal fillers), this is separate from the surgical case requirement of 150. To date, there have been no longitudinal studies to assess the impact of this requirement increase. The objective of this study is to evaluate the resident aesthetic surgery experience both before and after the increase in case log requirements by the ACGME. By assessing the changes in feelings and competencies, as well as training methods in place at different residency programs, the impact of the case log requirement increase may be evaluated.

METHODS

A 15-question written survey was administered at the annual Senior Residents Conference during the 2014 American Society of Plastic Surgery Annual Meeting and again during the 2017 Senior Residents Conference, in both electronic and hard copy forms. This survey consisted of questions addressing how aesthetic surgery training was performed at the respondents' institutions, where most of their training was performed and at what volume, what they felt was most valuable to their aesthetic surgery education, and plans after graduation. The 2017 survey included 2 additional questions asking respondents to state if they felt that the ACGME case log requirement increase was valuable to their training, and if 150 cases were enough for competency in aesthetic surgery (Appendix A). Only graduating plastic surgery residents from ACGME-approved programs in the United States were permitted to participate in the survey. For purposes of this study, "senior resident" was defined as any resident in his/her final year of training in either an integrated or independent residency program. This survey was not provided to program directors or other faculty in order to isolate the resident perception. The survey covered several areas of interest, including an evaluation and quantification of aesthetic surgical procedures performed by senior residents during their plastic surgery training, and resident confidence and satisfaction of the quality of their training. Questions with a large proportion of incomplete responses were unable to be analyzed. Statistical significance was calculated using a chi-squared test for a comparison of proportions.

RESULTS

For the 2014 survey, 125 senior residents attended the conference, and 87 responded to the survey (70%). For the 2017 survey, 131 senior residents attended the conference, and 59 responded to the survey (45%). In 2014, 100% completed a paper survey, and in 2017, 57.6% completed a paper survey, while 42.4% completed the survey in electronic form. In 2014, 45% of respondents were integrated residents and 55% were independent residents, compared to 55% integrated and 45% independent in 2017 ($P = 0.25$).

In 2014, the majority (67%) of plastic surgery residency programs represented by respondents did not have a dedicated aesthetic surgery rotation in their curriculum. In 2017, the reverse was true, with only 34% of respondents reporting not having a designated aesthetic surgery rotation as part of their training ($P = 0.0001$). Additionally, the number of respondents reporting a resident-run aesthetic clinic at their program trended toward significance, with an increase from 33% to 47% from 2014 to 2017 ($P = 0.09$). The estimated total average number of aesthetic surgery cases performed by plastic surgery residents was not statistically significantly different between cohorts, with 65%

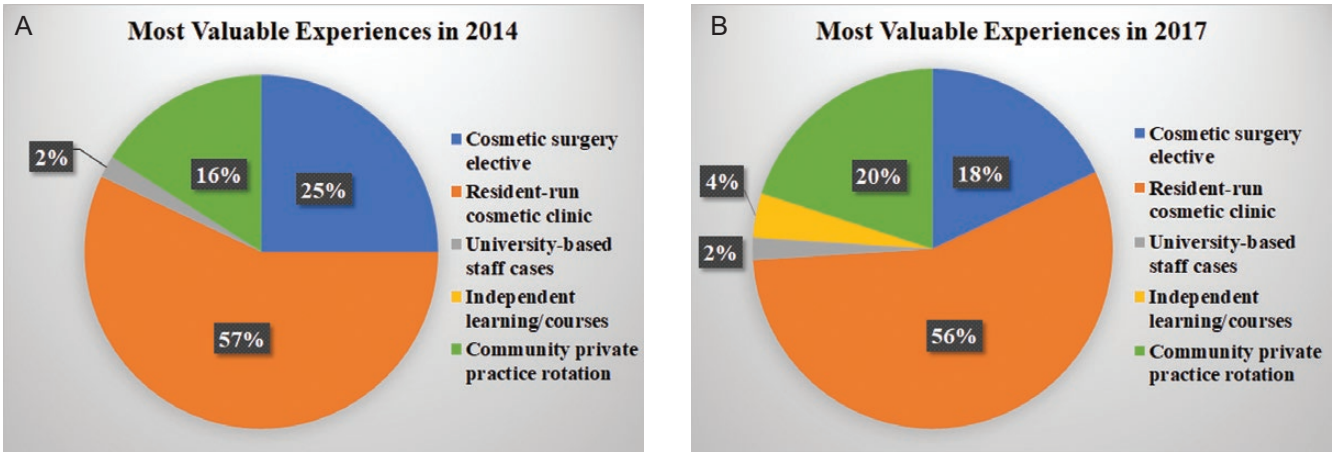

Figure 1. Resident-run cosmetic surgery clinic was consistently considered the most important exposure to aesthetic surgery, by 57% of residents in 2014 (A) and 56% of residents in 2017 (B). An elective in aesthetic surgery was considered the second-most valuable by 25% of residents in 2014 (A) and 18% in 2017 (B).

reporting 200 or less cases performed in 2014, and 71% reporting 200 or less in 2017 ($P = 0.45$). A resident-run cosmetic clinic was consistently found to be the most useful source of aesthetic surgery training, with 57% of respondents ranking it as the most useful training resource in 2014, and 56% of respondents reporting it as the most useful in 2017 (Figure 1) ($P = 0.9$). A resident-run cosmetic clinic was also considered the most useful way to further enhance aesthetic education by 87% of respondents in 2014, and 56% in 2017 ($P \leq 0.01$).

Additionally, in 2014, 17% of residents reported performing less than 20% of the aesthetic surgeries they participated in, with 16% reporting performing >60% of the case. In 2017, 34% reported performing less than 20% of the aesthetic cases ($P = 0.02$), and 2% reported performing >60% ($P = 0.007$). However, 68% of respondents in 2017 felt that the ACGME case log requirement increase from 50 to 150 had a positive impact on aesthetic surgery education, with 54% reporting that 150 was an appropriate number of required cases for graduation. Notably, in 2014, 36% of respondents felt comfortable integrating aesthetic surgery into their practice after graduation, but 59% of respondents felt comfortable doing so in 2017 ($P = 0.009$). In 2014, 35% of responding residents were moderately or extremely satisfied with their aesthetic surgery education, compared to 51% of respondents in 2017 (Figure 2) ($P = 0.06$).

Notably, similar percentages of residents graduating are planning to go into practice after graduation (48% vs 45%, $P = 0.73$) or are pursuing an aesthetic surgery fellowship (11% vs 13%, $P = 0.72$) (Table 1).

DISCUSSION

The ACGME case log requirement increase in 2014 emphasized to plastic surgery training programs the importance of aesthetic surgery education during training. The impact of the ACGME requirement increase can be seen when comparing our survey results between 2014 and 2017. Statistically significantly more programs are incorporating designated aesthetic surgery rotations into resident training, and more programs are incorporating resident-run cosmetic clinics as well. As more programs place a greater emphasis on aesthetic surgery training, resident education will prosper.

Resident cosmetic clinics and dedicated aesthetic surgery rotations were felt to be critical for enhancing aesthetic experience by the majority of graduating senior plastic surgery residents in the United States in both 2014 and 2017. These rotations are supervised by attending physicians, and are generally felt to enhance resident autonomy, decision making, and ability to mature surgically.[8–10] At our institution, the resident cosmetic clinic is completely run by the senior residents in their final year of training. They see patients and formulate treatment plans independently before staffing with a supervising attending. Surgical procedures are then performed independently as well, with the staffing attending available, as needed, but allowing the senior resident to operate as independently as possible with appropriate supervision as per ACGME guidelines. This graduated level of autonomy with appropriate oversight provides significant benefits related to decision-making and procedure competence in the final year of training. Hultman et al reported that a majority (83%) of ACAPS members surveyed felt resident cosmetic clinics were beneficial for resident education. More recent literature has demonstrated the value of in-office procedures within a resident-run cosmetic clinic, with higher confidence in procedures and more exposure to the procedures for competency after graduation.[11] It is notable that the number of residents citing resident cosmetic clinics as the best way to enhance their education decreased from 87% in 2014 to 56% in 2017. This is likely due to more

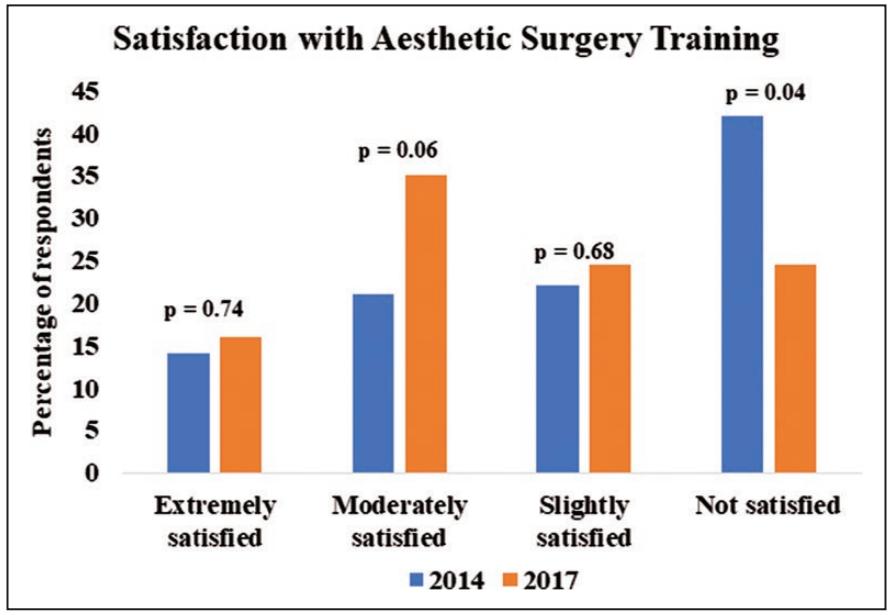

Figure 2. In 2014, 35% of respondents felt moderately or extremely satisfied with their aesthetic surgery training. This increased to 51% in 2017 after the ACGME case log requirement increase.

residencies including resident cosmetic clinics as part of aesthetic training, and interpretation of the question as *additional* methods to improve their education. More residents cited electives in aesthetic surgery (9%-18%) and community private practice rotations (3%-20%) as ways to further improve their aesthetic education in 2017.

Our survey suggests that these efforts by the ACGME have had positive effects on resident comfort level. More residents are moderately or extremely satisfied with their aesthetic surgery training now than in 2014, and the majority of residents feel comfortable incorporating aesthetic surgery into their future practice now compared to 2014. Although our survey evaluated resident satisfaction and comfort level, this does not necessarily indicate true competence. However, the increase in aesthetic rotations and resident cosmetic clinics indicates a greater focus on aesthetic education by programs, which theoretically should correlate with increased competence. Residents also agree that part of this positive effect on satisfaction and comfort is due to the case log requirement increase, with 68% of residents feeling that the increase had a positive effect on aesthetic surgery training. Despite this, approximately the same number of residents is applying for aesthetic fellowships. This may be due to fellowship prestige, a desire to market oneself in a specific way, networking opportunities through fellowship, or personal factors that were not captured in this survey.

One interesting find in our surveys was that despite more designated aesthetic surgery rotations and resident-run cosmetic clinics, residents are still reporting approximately the same number of total aesthetic cases performed during residency, and on average report performing less of the surgeries themselves. This may be due to a variety of different causes, including multiple residents participating in the same surgery or attending surgeon comfort with residents performing large portions of the procedures. Given the nature of resident cosmetic clinics, it seems likely that residents perform a large portion of cases done through this avenue. The fact that residents are reporting performing less of the procedures may come from other avenues for aesthetic cases, particularly if resident cosmetic clinics are a small part of the aesthetic curriculum or absent at some institutions. For instance, the percentage of residents performing the majority of aesthetic cases within large-volume aesthetic practices increased from 32% to 63% over the study period ($P \leq 0.01$). This may have affected the percentage of aesthetic cases residents are performing on average in ways not captured in the survey.

The number of aesthetic cases performed in total is revealing in that with the new requirements, it would seem that most programs have residents barely crossing the threshold for graduation by the end of their training. However, despite all this, the fact that resident comfort and satisfaction with their training have substantially increased is an important point and highlights that there may be other factors in play that are not captured within these surveys. Other factors such as supplemental online educational material and general increased focus on training in aesthetic surgery by residency programs after the ACGME case log requirement increase may contribute to this increased comfort and satisfaction.

One important fact to note is that our survey results contrast in some areas with other recently published, longitudinal surveys regarding aesthetic surgery training.[12] Hashem et al looked at how both program directors and

Table 1. Table of Discrete Survey Responses in 2014 and 2017

	2014	2017	*P* value
Designated aesthetics rotation?			
Yes	29 (33%)	39 (66%)	<0.01
No	58 (67%)	20 (34%)	-
Resident-run aesthetic clinic?			
Yes	29 (33%)	28 (47%)	0.09
No	58 (67%)	31 (53%)	-
Total aesthetic cases			
<100	18 (21%)	23 (40%)	0.01
101-200	38 (44%)	18 (31%)	0.12
201-300	22 (25%)	6 (10%)	0.02
301-400	5 (6%)	7 (12%)	0.20
>500	4 (5%)	4 (7%)	0.61
Percentage of total operative log aesthetic cases			
<5%	20 (23%)	20 (34%)	0.14
5-10%	30 (34%)	12 (20%)	0.07
10-15%	22 (25%)	12 (20%)	0.48
15-25%	12 (14%)	8 (14%)	1.00
25-50%	3 (3%)	7 (12%)	0.03
Location of training			
Private surgery center	32%	48%	0.06
Office-based practice	16%	17%	0.88
Academic hospital	29%	28%	0.90
Private hospital	10%	13%	0.59
Percentage of cases performed			
<20%	15 (17%)	20 (34%)	0.02
25-40%	27 (31%)	22 (37%)	0.45
40-60%	31 (36%)	16 (27%)	0.26
60-80%	9 (10%)	0 (0%)	NA
80-100%	5 (6%)	1 (2%)	0.24
Aesthetic cases performed within			
Large volume aesthetic practice (>50%)	28 (32%)	36 (63%)	<0.01
Moderate volume aesthetic practice (20-50%)	21 (24%)	13 (23%)	0.89
Low volume aesthetic practice (<20%)	36 (41%)	6 (11%)	<0.01
Resident cosmetic clinic	2 (2%)	2 (4%)	0.48

Table 1. Continued

	2014	2017	*P* value
Best way to improve aesthetic training			
Elective in cosmetic surgery	7 (9%)	10 (18%)	0.12
Resident-run cosmetic clinic	65 (87%)	31 (56%)	<0.01
University-based staff	1 (1%)	1 (2%)	0.62
Independent learning	0 (0%)	2 (4%)	NA
Private practice rotations	2 (3%)	11 (20%)	<0.01
Satisfaction with training?			
Extremely satisfied	12 (14%)	10 (16%)	0.74
Moderately satisfied	18 (21%)	20 (35%)	0.06
Slightly satisfied	19 (22%)	14 (25%)	0.68
Not satisfied	36 (42%)	14 (25%)	0.04
Positive impact of ACGME change?			
Yes	-	38 (68%)	-
No	-	18 (32%)	-
150 cases is appropriate?			
Yes	-	31 (61%)	-
No, higher	-	26 (43%)	-
No, lower	-	4 (7%)	-
Prepared for practice?			
Yes	31 (36%)	33 (59%)	<0.01
No	54 (64%)	23 (41%)	-
Plans after graduation			
Practicing	41 (48%)	24 (45%)	0.73
Craniofacial fellowship	6 (7%)	5 (9%)	0.67
Aesthetic fellowship	9 (11%)	7 (13%)	0.72
Microsurgery fellowship	17 (20%)	6 (11%)	0.17
Hand fellowship	12 (14%)	12 (22%)	0.18
Type of residency			
Integrated	38 (45%)	29 (55%)	0.26
Independent	47 (55%)	24 (45%)	-

residents felt regarding aesthetic surgery training in residency.[12] While they also found that residents found cosmetic clinics to be the most valuable experience, they reported only 31.5% feeling ideally prepared to integrate cosmetic surgery into their practice. This contrasts with our finding of 59% in 2017. However, Hashem's survey was provided to residents PGY-1 to PGY-6 enrolled in the

ASAPS resident program, whereas the survey for this study was provided exclusively to senior residents at the ASPS senior residents conference.[12] The variation in seniority of respondents may have impacted this discrepancy between our survey results.

The results of our study highlight the important role of comprehensive cosmetic surgery training within the plastic surgery core curriculum. Increasing elective aesthetic plastic surgery experience throughout residency training is extremely valuable to residents, which our survey highlights. Both ASPS and ASAPS have undertaken positive measures to improve the learning experience in aesthetic surgery in recent years, such as online resources and videos via the Plastic Surgery Education Network (PSEN) and PSEN Resident Education Center (REC) from ASPS, and the RADAR Resident Network from ASAPS, which likely have been highly valuable to residents as well. Additionally, the American Board of Cosmetic Surgery (ABCS) often highlights its requirement of 300 procedures for board certification compared to 150 for categorical plastic surgery.[13] However, the ABCS is not recognized by the American Board of Medical Specialties (ABMS), and, unlike plastic surgery, does not require minimum numbers for specific procedures, only broad categories. Despite this, it is important that plastic surgeons continue to promote aesthetic education during residency training programs and highlight the rigorous training required for graduation.

The limitations of this survey reflect the challenge of obtaining a representative sample of surveys from graduating senior plastic surgery residents at the senior resident conference. We had a response rate of 70% in 2014 and 45% in 2017, despite the survey being available in both paper and electronic form in the same forum. It is unclear what caused this difference in response rate, as participants were reminded to complete the survey multiple times both in person and electronically. The difference in response rate may have affected our results, and our sample may not reflect the experience of residents in different regions of the country equally. Additionally, the wording and timing of the survey may have affected responses in unpredictable ways. Aesthetic surgery rotations and resident cosmetic clinics were not strictly defined in our survey, introducing potential bias and variability based on respondent interpretation. Our attempt with using a 15- question survey was simplicity of completion, with the goal of more complete responses. However, this sacrifices comprehensiveness with the survey of all aspects related to aesthetic surgery training. The Senior Residents Conference is open to all senior residents across the country in plastic surgery residencies. Depending on the size of programs residents are from, and if all programs were represented, our data could be biased based on participation in the conference. This study is also subject to recall bias, with respondents recollecting their experiences and procedure numbers after they are already performed. Finally, we were unable to analyze all questions on the survey, particularly the number of each type of case performed by residents (Question 14), secondary to incomplete responses. Incomplete responses were likely due to the complexity of the question and time required for completion compared to other questions.

CONCLUSION

Aesthetic surgery is an integral component of the specialty of plastic surgery. Previous studies have highlighted low resident comfort levels with aesthetic surgery during their training, and the ACGME has responded accordingly to address these concerns. Our study is the first longitudinal study to evaluate the ACGME case log requirement increase, and suggests that increase had a positive impact on resident aesthetic surgery education. Residents have increased comfort and satisfaction with their training, and feel more prepared to incorporate aesthetic surgery into their practice after graduation. Additionally, our survey continues to highlight the value of resident-run cosmetic clinics for resident aesthetic surgery training. Current plastic surgery training programs without resident-run cosmetic clinics should consider incorporating them into their curriculum.

Supplementary Material

This article contains supplementary material located online at www.aestheticsurgeryjournal.com.

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Disclosures

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