A Survey of Cosmetic Surgery Training in Plastic Surgery Programs in the United States

Colin M. Morrison, M.Sc.
S. Cristina Rotemberg, M.D.
Andrea Moreira-Gonzalez, M.D.
James E. Zins, M.D.
Cleveland, Ohio

Background: Aesthetic surgery is evolving rapidly, both technologically and conceptually. It is critical for the specialty that aesthetic surgery training keep pace with this rapid evolution. To shed more light on this issue, a survey was sent to all program directors and senior plastic surgery residents to record their impressions of the quality of cosmetic surgery resident training. The authors report the results of this national cosmetic surgery training survey canvassing all 89 plastic surgery programs.

Methods: A three-page survey delineating resident preparedness in aesthetic surgery was sent to senior plastic surgery residents and program directors in April of 2006 and collected through October of 2006.

Results: Of 814 surveys, 292 responses were obtained from 64 percent of program directors and 33 percent of senior residents. Breast augmentation, breast reduction, and abdominoplasty were most frequently performed with the highest resident comfort levels. Rhinoplasty remained a particular area of trainee concern, but confidence levels were also low in face lifts, endoscopic procedures, and body contouring techniques. Experience with skin resurfacing, fillers, and botulinum toxin type A was another area of concern. Although 51 percent of residents felt prepared to integrate cosmetic surgery into their practices on graduation, 36 percent felt that further cosmetic training was desirable.

Conclusions: The information collected revealed significant differences in opinions between program directors and senior residents. Senior residents felt deficient in facial cosmetic, minimally invasive, and recently developed body contouring techniques. On the basis of these results and the authors’ experience in resident education, changes in cosmetic surgery training are suggested. (Plast. Reconstr. Surg. 122: 1570, 2008.)

Nearly 11 million cosmetic surgery procedures were performed in the United States in 2006. Traditional surgical interventions increased by 2 percent, to over 2 million; and minimally invasive procedures rose by 8 percent, to more than 9.1 million.1 As third-party reimbursement declines, many plastic surgeons are gravitating toward cosmetic surgery to lessen their financial shortfall. Academic institutions are also more interested in cosmetic procedures, as they offer a logical source of additional revenue in a time of reduced budgets and health care reforms.2

New challenges and competition face plastic surgeons in this cosmetic surgery arena.3 Dramatic advances in information technology have produced a well-informed, increasingly sophisticated patient population. Competition comes not only from within plastic surgery but also from otolaryngologists, ophthalmologists, dermatologists, and physicians outside conventional cosmetic-related specialties.

Although it is clear that graduating plastic surgery residents require the highest standard of cosmetic surgery training if they are to maintain a competitive edge, what defines this standard is perhaps less clear. In an attempt to evaluate the quality of current cosmetic surgery training and identify perceived strengths and weaknesses, we conducted a survey of plastic surgery program directors and senior residents in 2006.

Disclosure: None of the authors has a financial interest in any of the products, devices, or drugs mentioned in this article.
METHODS

All currently approved plastic surgery programs in the United States (n = 89) were surveyed. A pretesting trial of surgeons (n = 10) was used to identify ambiguities and inconsistencies in the cover letter and survey questions.4,5

The survey addressed two broad areas: (1) specifics regarding resident cosmetic surgery training and (2) the confidence and satisfaction associated with this experience. The questionnaire was designed to maximize physician participation (Fig. 1). It was formatted so that respondents could simply encircle an appropriate answer and included multiple choice questions that used a five-point, ordinal scale. This scale ranked the respondents’ answers from 1 (not confident) to 5 (very confident).

The survey consisted of 14 questions (program directors) and 19 questions (senior residents), contained on three pages. It was completed readily in approximately 10 to 15 minutes. Additional questions that applied to senior residents but not program directors detailed desirable areas of additional training and future career aspirations. Senior residents were offered a cash incentive of $15 to complete the survey.

Surveys were mailed in April of 2006 to senior residents only. Responses to the survey were collected through October of 2006. A recent listing and the corresponding mailing address for program directors and senior residents was obtained from the American Society of Plastic Surgeons. Surveys were distributed in a single mailing.

The returned questionnaires underwent examination to ensure that the directions had been followed and that the data reported were consistent and accurate. The responses were entered into an Excel spreadsheet (Microsoft Corp., Redmond, Wash.). Incomplete surveys were included to the greatest possible extent.

The analysis was performed using R software. Results of the exact and asymptotic tests were compared and found to be similar, so the asymptotic results are presented. Responses to each question were summarized using frequencies and percentages. To compare responses between program directors and residents, chi-square tests were used for nominal and two-level variables. Comparisons on ordered variables were performed using Wilcoxon rank sum tests. A significance level of 0.05 was assumed for all tests.

RESULTS

A total of 292 surveys were returned. Fifty-seven of 89 program directors’ surveys (64 percent) and 235 of 705 senior residents’ surveys (33 percent) were successfully completed.

Program Director Survey

Eighty-seven percent of the program directors responding were men and 13 percent were women. Sixty-five percent of the responding plastic surgery programs in the United States were independent, whereas 35 percent were integrated. Ninety-eight percent of programs include a specific cosmetic surgery rotation. The majority of program directors stated that there is considerable exposure to a variety of minimally invasive techniques and that over 75 percent of residents receive adequate laser training. Program directors were significantly more likely to state that a cosmetic rotation included skin care, chemical peels, and noninvasive laser treatments (Table 1).

In independent programs, 3 to 6 months was the most common amount of time spent in cosmetic surgery rotations, accounting for between 60 and 70 percent of responses. In the integrated programs, cosmetic surgery rotations were much more frequent in later years (years 5 and 6). Program directors stated that 72 percent of training programs have a resident cosmetic clinic and 50 percent of those with a clinic stated that their trainees perform at least 20 clinic cases each year.

Program directors felt that a combination of a resident cosmetic clinic and staff cosmetic patients provides the most useful form of training. Approximately 40 percent of program directors indicated that more than half of their residents pursue fellowships. Slightly more than half of program directors encourage their residents to pursue some type of postgraduate cosmetic fellowship. Twenty-five percent also mentioned that more than half of their residents pursue solo private practice, and fewer join group private practice or practice at an academic institution. Seventy-six percent of program directors stated that residents were satisfied (level 4 or 5) with the cosmetic training available at their institution (Table 2).

With regard to comfort level with a variety of operations, program directors’ opinions paralleled those of senior residents. In the opinion of the program directors, residents were most comfortable performing breast and body contouring procedures. Rhinoplasty, endoscopic breast augmentation, hair transplantation, and newer body contouring techniques were perceived as the most challenging procedures and/or procedures with which residents were least familiar.
In all surgery types, program directors indicated that they had greater confidence in the ability of residents to perform procedures than the senior residents stated themselves. In most cases, the difference was highly significant ($p < 0.001$). In endoscopic breast augmentation, the difference, though statistically significant, was smaller ($p = 0.038$) (Table 3).
9) If you could dedicate a month during your residency to improve your skills in a procedure that you don’t feel currently confident doing, what would you choose? (circle all that apply)
   a) Skin care
   b) Laser resurfacing
   c) Chemical peels
   d) Noninvasive laser treatments
   e) Breast reduction
   f) Breast augmentation
   g) Abdominoplasty
   h) Body contour after massive weight loss
   i) Rhinoplasty
   j) Face lift
   k) Brow lift
   l) Blepharoplasty
   m) Mastopexy
   n) Hair transplantation

10) How satisfied are you with your cosmetic training? (circle one)

<table>
<thead>
<tr>
<th>Not at all satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

11) How many of each of the following cases do you think you would need to do in order to perform that procedure safely and with confidence? (circle one answer for each question)
   a) Breast reduction (1) 0-3 (2) 4-7 (3) 8-10 (4) >10
   b) Breast augmentation (1) 0-3 (2) 4-7 (3) 8-10 (4) >10
   c) Abdominoplasty (1) 0-3 (2) 4-7 (3) 8-10 (4) >10
   d) Liposuction (1) 0-3 (2) 4-7 (3) 8-10 (4) >10
   e) Facelift (1) 0-3 (2) 4-7 (3) 8-10 (4) >10
   f) Rhinoplasty (1) 0-3 (2) 4-7 (3) 8-10 (4) >10

12) Regarding your staff approach to a cosmetic case, what percentage of a cosmetic case do you actually do? (circle one)
   (1) <25% (2) 25-50% (3) 51-75% (4) 76-99% (5) 100%

13) Do you have a resident cosmetic clinic? (circle one)
   (1) Yes (0) No

14) If you answered “Yes” to question 13, how many cases a year are you allowed to do in your resident cosmetic clinic? (circle one)
   (1) 1-9 (2) 10-15 (3) 16-20 (4) >20

15) Where do you think you get the most benefit from learning a cosmetic case? Please rank the following (1= best, 2= second best, 3=worst):
   a) Resident cosmetic clinic __________
   b) Staff cosmetic patient __________
   c) Books, journals __________

16) How well prepared are you to integrate cosmetic surgery into your practice when you graduate? (circle one)

<table>
<thead>
<tr>
<th>Not at all prepared</th>
<th>Very prepared</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

17) If you are interested in a cosmetic practice, do you feel the need for a cosmetic fellowship? (circle one)
   (1) Yes (0) No

18) Do you plan to pursue subspecialty training? (circle one)
   (0) No
   (1) Cosmetics
   (2) Breast
   (3) Microsurgery
   (4) Hand
   (5) Craniofacial

19) What are your future goals? (circle one)
   (1) Solo private practice
   (2) Group private practice
   (3) Academic institution

Fig. 1. (Continued.)
Senior Resident Survey

Seventy-six percent of the senior residents who replied were men and 24 percent were women. Fifty-nine percent trained in independent programs, and 41 percent trained in integrated programs. Ninety-seven percent of senior residents with complete responses stated that they had some form of cosmetic surgery rotation, and the majority (80 percent) had rotations with their local faculty. Nonsurgical interventions formed a small component of these rotations. Only a minority of trainees received exposure to superficial, intermediate, or deep chemical peeling; noninvasive laser; or skin care (Table 1).

Rotations commonly lasted 3 to 4 months. In independent programs, the majority of senior residents had their cosmetic surgery training in the second year. Similarly, in integrated programs, rotations were included most frequently in the latter years (years 5 and 6).

Sixty-four percent of programs have a resident cosmetic clinic. Most trainees (76 percent) felt that resident cosmetic clinics were the most beneficial form of teaching.

Fifty-four percent of those with resident cosmetic clinics stated that they perform at least 20 cases in their clinic per year. Fifty percent of senior residents plan to pursue some type of subspecialty postgraduate training and 36 percent felt that a cosmetic surgery fellowship would be helpful (Table 4).

With regard to individual cosmetic procedures, senior residents claimed to have the greatest confidence and comfort level with breast and body contouring, including open breast augmentation, breast reduction, and abdominoplasty. Senior residents had the lowest comfort levels with endoscopic breast augmentation, rhinoplasty, hair transplantation, and lower body lifts. Fifty-one percent of the respondents stated that they were satisfied (level 4 or 5) with their program and felt prepared to integrate cosmetic surgery into their practice on graduation (Table 2).

Seventy percent of senior residents cited rhinoplasty as the procedure with which they desired

---

### Table 1. Cosmetic Surgery Training Survey Responses from Program Directors and Senior Residents in Plastic Surgery Programs

<table>
<thead>
<tr>
<th>Variable</th>
<th>Program Directors</th>
<th>Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>55 7 12.7</td>
<td>235 57 24.3</td>
</tr>
<tr>
<td>Male</td>
<td>55 48 87.3</td>
<td>235 178 75.7</td>
</tr>
<tr>
<td>Program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independent</td>
<td>55 36 65.5</td>
<td>232 136 58.6</td>
</tr>
<tr>
<td>Integrated</td>
<td>55 19 34.5</td>
<td>232 96 41.4</td>
</tr>
<tr>
<td>Cosmetic rotation</td>
<td>46 45 97.8</td>
<td>165 160 97.0</td>
</tr>
<tr>
<td>Rotations with faculty</td>
<td>56 43 76.8</td>
<td>232 186 80.2</td>
</tr>
<tr>
<td>Chemical peels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Superficial</td>
<td>57 32 56.1</td>
<td>235 95 40.4</td>
</tr>
<tr>
<td>Intermediate</td>
<td>57 26 45.6</td>
<td>235 83 35.3</td>
</tr>
<tr>
<td>Deep</td>
<td>57 24 42.1</td>
<td>235 53 22.6</td>
</tr>
<tr>
<td>Laser resurfacing</td>
<td>57 44 77.2</td>
<td>235 127 54.0</td>
</tr>
<tr>
<td>Noninvasive laser treatments</td>
<td>57 30 52.6</td>
<td>235 84 35.7</td>
</tr>
<tr>
<td>Skin care</td>
<td>57 34 59.6</td>
<td>234 77 32.9</td>
</tr>
<tr>
<td>Resident cosmetic clinic</td>
<td>57 41 71.9</td>
<td>235 151 64.3</td>
</tr>
<tr>
<td>Cases performed by residents (per year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1–9</td>
<td>40 1 2.5</td>
<td>148 17 11.5</td>
</tr>
<tr>
<td>10–15</td>
<td>40 11 27.5</td>
<td>148 33 22.3</td>
</tr>
<tr>
<td>16–20</td>
<td>40 8 20.0</td>
<td>148 18 12.2</td>
</tr>
<tr>
<td>&gt;20</td>
<td>40 20 50.0</td>
<td>148 80 54.1</td>
</tr>
</tbody>
</table>

*p* Chi-square tests.
†Wilcoxon rank sum test.

### Table 2. Program Director and Resident Satisfaction with Current Cosmetic Surgery Training

<table>
<thead>
<tr>
<th>Total</th>
<th>1 (%)</th>
<th>2 (%)</th>
<th>3 (%)</th>
<th>4 (%)</th>
<th>5 (%)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>1 (1.8)</td>
<td>3 (5.5)</td>
<td>9 (16.4)</td>
<td>28 (50.9)</td>
<td>14 (25.5)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>234</td>
<td>13 (5.6)</td>
<td>33 (14.1)</td>
<td>68 (29.1)</td>
<td>70 (29.9)</td>
<td>50 (21.4)</td>
<td></td>
</tr>
</tbody>
</table>
further experience. Face lift, chemical peels, and laser resurfacing were also listed by nearly 50 percent of respondents. Breast reduction and abdominoplasty were the skills for which the least additional training was considered necessary (Table 5).

With regard to minimum numbers of procedures in cosmetic “index categories,” 80 percent of senior residents indicated that more than 10 cases were necessary to perform a rhinoplasty (80 percent) or a face lift (66 percent) safely and with
confidence. In contrast, only 20 percent and 26 percent of respondents felt than more than 10 cases were needed for competence in liposuction and abdominoplasty, respectively.

**DISCUSSION**

Plastic surgery training currently involves two pathways to board certification, and each one includes a formal cosmetic surgery training component. The Residency Review Committee of the Accreditation Council for Graduate Medical Education has established minimum cosmetic surgery case requirements for both independent and integrated programs. These include 10 breast augmentations, seven face lifts, eight blepharoplasties, six rhinoplasties, five abdominoplasties, 10 suction lipectomies, and nine “other” cosmetic procedures. These requirements are one objective, minimum measure of resident experience. When combined with didactic lectures, office experience, and progressive operative responsibility, they form the basis of modern cosmetic surgery training. Most recently, our plastic surgery societies, such as the American Association of Chairmen in Plastic Surgery, have added educational modules to their web sites including Botox and other injectables, filling potential voids in resident education.

There has been considerable debate regarding the ideal format for plastic surgery education. Editorials have been devoted to this subject and a number of publications have attempted to delineate the optimal prerequisite and requisite training period. Our article has attempted to add to the body of plastic surgery literature by focusing on the cosmetic component of plastic surgery training. This was done in survey format, canvassing two groups intimately involved in plastic surgery training: current plastic surgery senior residents and program directors. Senior residents were queried because they have had the most recent experience in plastic surgery cosmetic training. Program directors were selected for survey because they are arguably the most attuned, the most knowledgeable, and the best qualified to assess the resident fund of knowledge and technical abilities. The response rate of program directors (64 percent) suggests that they are particularly interested in this issue.

Our results confirm what many plastic surgeons might expect: residents feel most comfortable performing aesthetic surgery of the breast and trunk and feel least prepared and most vulnerable with complex facial aesthetic surgery. Endoscopic procedures and more recently developed body procedures such as a lower body lift are additional areas where the majority of senior residents rate their level of expertise as low.

The survey suggests that current training may not be addressing advances in the nonsurgical and minimally invasive aspects of cosmetic surgery. According to statistics from the American Society for Aesthetic Plastic Surgery, nonsurgical cosmetic procedures increased by 747 percent from 1997 to 2006. Although this area may not require great surgical expertise, some familiarity with these procedures would be helpful, given the increasing frequency with which they are performed in practice.

Cosmetic surgery training, however, needs to be kept in the context of plastic surgery education as a whole. Not only cosmetic surgery but also most other areas of subspecialty interest in plastic surgery are becoming more complex. Increasing time spent in one area by default decreases time spent elsewhere. A recent survey of educational goals by plastic surgery graduates highlighted this issue. When practicing plastic surgeons were asked to prioritize time spent in subspecialty areas, cosmetic surgery ranked fourth behind hand surgery, breast surgery, and microsurgery.

As with most surveys, this article has its weaknesses. Both senior residents’ and program directors’ opinions were evaluated using the Likert (five-point) scale. Although this is not a validated tool, the goal of this study was to understand opinions and experiences of residents and program directors. As such, we are aware of no better objective means with which to evaluate whether responses reflect “truth,” allowing for a validated tool. Despite this lack of validation, we believe that this study accurately reflects the opinions and experiences of our target population.

Unfortunately, the resident response rate was significantly lower (33 percent) than that of the program directors. This occurred despite a cash incentive offered to the plastic surgery residents. Clinical responsibilities and time constraints were inevitable contributing factors. However, some surveys were also returned unopened, suggesting recent address changes. When only one-third of respondents answer a given survey, it is uncertain whether the respondents are typical of that given population. In an attempt to ensure that respondents were indeed typical of the senior resident and program director population, we corroborated that the female-to-male ratio of plastic surgery residents correlated to the 25 to 75 percent female-to-male ratio of resident respondents (Table 1). Although resident response rates were admittedly

Copyright © American Society of Plastic Surgeons. Unauthorized reproduction of this article is prohibited.
low, these rates compare favorably with other recent and related studies. This includes the American Society for Aesthetic Plastic Surgery/American Society of Plastic Surgeons Laser Task Force Survey,14 in which a 34 percent response rate was noted; and the National Plastic Surgery Survey: Face lift Techniques and Complications, in which a 15 percent response rate was noted.15

We also failed to differentiate between independent and integrated programs. We decided not to do this because the small number of resident responses in each group would have made comparisons difficult.

Can cosmetic surgery be adequately taught as part of the core curriculum in the twenty-first century?12 We and others agree that it is possible, but we also believe that cosmetic surgery training should be refined and improved.

One option is to extend the training period to include modules based on specific areas of resident interest (e.g., those interested in craniofacial surgery would choose a craniofacial training module; those interested in cosmetic surgery, a cosmetic module). The optimum length of time spent in a given module, however, has not yet been determined and might need to be constrained should one subspecialty prove substantially more popular than others.12

Our suggestions for change include (1) establishing a national standardized core cosmetic curriculum; (2) the addition of a compulsory plastic surgery resident clinic; (3) updating the cosmetic index cases to include recently developed body contouring procedures, fillers, botulinum toxin type A (Botox; Allergan, Inc., Irvine, Calif.), and nonablative light-based techniques; (4) expanding the minimum requirements in rhinoplasty and other facial cosmetic procedures; (5) encouraging programs that are deficient in certain aspects of cosmetic surgery to establish formal rotations with stronger units; and finally (6) the development of postgraduate cosmetic fellowships funded by national societies.

Quality postgraduate fellowships are currently limited in number, at least in part because funding for these fellowships falls on the institution or practice. If partial funding was provided by our national societies, more quality fellowships might result.

We hope that this survey acts as a stimulus to reevaluate plastic surgery education. History shows that if we as plastic surgeons do not seek the initiative, other specialties or individuals certainly will. These suggested changes may be the best way of maintaining the high standards expected of our specialty.

**SUMMARY**

This national survey of plastic surgery program directors and senior residents in the United States documents current perceptions of cosmetic surgery training. Breast and body contouring surgery are seen as areas of strength, whereas rhinoplasty and other facial cosmetic procedures are seen as areas of weakness. Senior residents also highlight a lack of organized training in minimally invasive and nonsurgical techniques. Means of enhancing cosmetic surgery education are suggested, including the establishment of a compulsory resident clinic, expanding the cosmetic “index cases,” and encouraging the development and funding of postgraduate cosmetic surgery fellowships.

**ACKNOWLEDGMENTS**

The authors thank Darlene Lyons, Department of Plastic Surgery, Cleveland Clinic, and James Bena, Quantitative Health Sciences, Cleveland Clinic, for their assistance with preparation of this article.

**REFERENCES**


---

**English Language Assistance for Authors**

Appropriate use of the English language is a requirement for publication in *Plastic and Reconstructive Surgery*. Authors who have difficulty in writing English may seek assistance with grammar and style to improve the clarity of their manuscript. Many companies provide substantive editing via the Web. Website addresses for these companies include:

- www.biosciencewriters.com
- www.bostonbioedit.com
- www.sciencedocs.com
- www.prof-editing.com
- www.journalexperts.com
- www.themedicaleditor.com

Please note that neither the American Society of Plastic Surgeons nor the *Journal* takes responsibility for, or endorses, these services. Their use does not guarantee acceptance of a manuscript for publication.