Professional Perceptions of Plastic and Reconstructive Surgery: What Primary Care Physicians Think

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Background: The great breadth of the specialty of plastic surgery is often misunderstood by practitioners in other specialties and by the public at large. The authors investigate the perceptions of primary care physicians in training toward the practice of different areas of plastic and reconstructive surgery.
Methods: A short, anonymous, Web-based survey was administered to residents of internal medicine, family medicine, and pediatrics training programs in the United States. Respondents were asked to choose the specialist they perceived to be an expert for six specific clinical areas, including eyelid surgery, cleft lip and palate surgery, facial fractures, hand surgery, rhinoplasty, and skin cancer of the face. Specialists for selection included the following choices: dermatologist, general surgeon, ophthalmologist, oral and maxillofacial surgeon, orthopedic surgeon, otolaryngologist, and plastic surgeon.
Results: A total of 1020 usable survey responses were collected. Respondents believed the following specialists were experts for eyelid surgery (plastic surgeon, 70 percent; ophthalmologist, 59 percent; oral and maxillofacial surgeon, 15 percent; dermatologist, 5 percent; and otolaryngologist, 5 percent); cleft lip and palate surgery (oral and maxillofacial surgeon, 78 percent; plastic surgeon, 57 percent; and otolaryngologist, 36 percent); facial fractures (oral and maxillofacial surgeon, 88 percent; plastic surgeon, 36 percent; otolaryngologist, 30 percent; orthopedic surgeon, 11 percent; general surgeon, 3 percent; and ophthalmologist, 2 percent); hand surgery (orthopedic surgeon, 76 percent; plastic surgeon, 52 percent; and general surgeon, 7 percent); rhinoplasty (plastic surgeon, 76 percent; otolaryngologist, 45 percent; and oral and maxillofacial surgeon, 18 percent); and skin cancer of the face (dermatologist, 89 percent; plastic surgeon, 35 percent; oral and maxillofacial surgeon, 9 percent; otolaryngologist, 8 percent; and general surgeon, 7 percent).
Conclusion: As the field of plastic surgery and other areas of medicine continue to evolve, additional education of internal medicine, pediatrics, and family practice physicians and trainees in the scope of plastic surgery practice will be critical. (*Plast. Reconstr. Surg.* 126: 643, 2010.)

The specialty of plastic surgery has evolved to encompass a wide breadth of clinical expertise and includes both reconstructive and aesthetic surgery. Reconstructive procedures cover all areas of the body and include diverse areas such as breast reconstruction, burn surgery, craniofacial surgery, facial trauma surgery, extremity coverage, microsurgery, and hand surgery. Aesthetic procedures also include all areas of the body including head and neck, breast, body, and extremities.

Such diversity in clinical proficiency and practice can be confusing to those outside of plastic surgery. Primary care physicians, such as internists, family practitioners, and pediatricians, may not know the full extent of the plastic surgery specialty.

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These practitioners serve as an important source of information to their patients regarding the services offered by plastic surgeons. Furthermore, these physicians also serve as an important referral base for plastic and reconstructive surgeons.

Confusion by referring physicians may have many reasons.[1] Increased subspecialization may be one factor. For example, plastic surgeons who may have practices focused on craniofacial surgery or breast reconstruction may wish to advance their reputation in these areas and perform fewer procedures in other areas. Other plastic surgeons may seek to advertise their expertise in cosmetic surgery and may wish to be known only as aesthetic surgeons. Indeed, many plastic surgeons indicate that their practice mix shifts toward a greater percentage of aesthetic surgery as their practice matures.

In addition, practitioners in other specialties have increasingly advanced on procedures and areas that have traditionally been served by plastic surgeons. Specialists in fields such as dermatology, ophthalmology, general surgery, oral and maxillofacial surgery, orthopedic surgery, and otolaryngology–head and neck surgery have more and more procedures that overlap with plastic surgery. This will likely increase in the future, as numerous subspecialty fellowship training programs exist such as oculoplastic surgery after ophthalmology, facial plastic and reconstructive surgery after otolaryngology, hand surgery after orthopedic surgery, and even now "oncoplastic surgery" after general surgery. Additional fellowships not recognized by the American Board of Medical Specialties such as cosmetic surgery also exist.

We believe that the current perceived role of plastic surgeons in patient care among referring physicians has not been completely assessed.[2] The objective of this study was to examine the perceptions of a cross-section of primary care physicians and physicians-in-training toward the types of procedures commonly performed by plastic surgeons.

MATERIALS AND METHODS

An anonymous, Web-based survey was distributed to primary care residents in all training programs in internal medicine, family medicine, pediatrics, and internal medicine–pediatrics combined programs in the United States. Program directors were e-mailed the survey instrument and asked to forward it to their residents. As there was no way to ensure the compliance of the request, program directors were e-mailed a second time, 1 week after the initial distribution.

Respondents were asked to select the specialist they perceived to be an expert for six specific clinical areas within the realm of plastic and reconstructive surgery. These clinical areas included eyelid surgery, cleft lip and palate surgery, facial fracture management, hand surgery, rhinoplasty, and skin cancer of the face. Each clinical area included the following answer choices: dermatologist, general surgeon, ophthalmologist, oral maxillofacial surgeon, orthopedic surgeon, otolaryngologist, and plastic surgeon. Respondents were permitted to select more than one specialist for each clinical area. Gender, field, year of training, and state of residency were also elicited as demographic variables to further categorize responses. Statistical analyses were conducted using SAS 9.2 software (SAS Institute, Inc., Cary, N.C.).

Only responses with data available for all of the demographic variables were used; respondents who failed to choose at least one response for each of the clinical scenarios were excluded. Because of sparse numbers, residents who indicated they were in year 4 or greater of residency training were also excluded (with the exception of internal medicine–pediatrics combined programs, which are typically 4-year programs). Descriptive statistics were obtained for the demographic variables to describe the sample.

For each respondent, a total was computed for each specialty, defined as the number of questions for which that specialty had been one of the responses. The total for plastic surgery was identified as the primary dependent variable of interest and its frequency distribution was computed. Group means were also calculated across the different categories of the four classification variables: gender, field, year, and geographic division (as defined by the U.S. Census Bureau's breakdown of nine divisions). Based on observed differences, field was collapsed into a new variable, "pediatrics," which distinguished between pediatrics residents and those in other fields (including internal medicine–pediatrics combined programs).

An ordinal logistic regression model was then manually fit for the total for plastic surgery with gender, pediatrics, year, and division as potential predictors. Cross-tabulated frequencies were calculated and chi-square associations were computed among the association variables. Finally, a binary logistic regression model was fit (based on whether plastic surgery had been one of the responses or not) to assess the validity of the predictive model separately for each procedure.

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RESULTS

Surveys of respondents who failed to answer the demographic questions or provide at least one response for each of the clinical scenarios were excluded from this study. Data were retained for 1020 respondents. Forty-one percent ($n = 417$) of these were men and 59 percent ($n = 603$) were women. Thirty-six percent ($n = 371$) identified themselves as being in year 1 of postgraduate training; 32 percent ($n = 327$) identified themselves as being in year 2; 30 percent ($n = 308$) identified themselves as being in year 3; and 1 percent ($n = 14$) identified themselves as being in year 4. Thirty-one percent ($n = 317$) identified themselves as being in internal medicine residency programs; 25 percent ($n = 260$) were in family medicine; 38 percent ($n = 386$) were in pediatrics; and 6 percent ($n = 57$) were in combined internal medicine–pediatrics programs. There was a diverse representation of respondents from across the United States, with New York, Illinois, and California contributing the greatest number of respondents (Table 1).

The remainder of the survey focused on the physicians' assessments of who they believed were experts in six specific clinical disciplines. There was no limit to the number of specialties respondents could choose for each question. As respondents were allowed to choose more than one specialty for each question, the total percentages may be greater than 100 percent. The set of responses to a given question constitutes a "response profile." The mean number of responses per question was 1.54 ± 0.47.

For eyelid surgery (Fig. 1, *above*, *left*), the largest number, 69.7 percent ($n = 769$) of respondents, felt that plastic surgeons are experts. This was closely followed by 59.2 percent ($n = 654$) selecting ophthalmologist and the remainder distributed among the other specialties. For cleft lip and palate surgery (Fig. 1, *above*, *right*), 77.3 percent ($n = 850$) chose oral maxillofacial surgeon, followed by 56.1 percent ($n = 617$) for plastic surgeon and 35.9 percent ($n = 395$) for otolaryngologist. With facial fractures (Fig. 1, *center*, *left*), the overwhelming majority of 88.4 percent ($n = 971$) selected oral maxillofacial surgeon followed by 35.7 percent ($n = 392$) for plastic surgeon and 29.9 percent ($n = 329$) otolaryngologist. In hand surgery (Fig. 1, *below*, *left*), 75.2 percent ($n = 820$) of respondents chose orthopedic surgeon followed by 52 percent ($n = 567$) for plastic surgeon. For rhinoplasty (Fig. 1, *center*, *right*), 75.6 percent ($n = 819$) selected plastic surgeon, 45.4 percent ($n = 492$) selected otolaryngologist, and 18.3 percent ($n = 198$) selected oral maxillofacial surgeon. For skin cancer of the face (Fig. 1, *below*, *right*) the great majority, 89.4 percent ($n = 964$), responded dermatologist, followed by 36 percent ($n = 388$) for plastic surgeon, 9.0 percent ($n = 97$) for oral maxillofacial surgeon, and 7.6 percent ($n = 82$) for otolaryngologist.

In summary, the percentage of primary care physicians who selected plastic surgeons as experts was

Table 1. Geographic Location of Respondents ($n = 1020$)

Division	No. (%)
New England	71 (6.96)
Connecticut	23 (2.25)
Maine	9 (0.88)
Massachusetts	26 (2.55)
New Hampshire	11 (1.08)
Vermont	2 (0.20)
Middle Atlantic	179 (17.55)
New Jersey	39 (3.82)
New York	100 (9.80)
Pennsylvania	40 (3.92)
East North Central	182 (17.84)
Illinois	75 (7.35)
Indiana	17 (1.67)
Michigan	30 (2.94)
Ohio	48 (4.71)
Wisconsin	12 (1.18)
West North Central	112 (10.98)
Iowa	21 (2.06)
Kansas	21 (2.06)
Minnesota	29 (2.84)
Missouri	30 (2.94)
Nebraska	4 (0.39)
North Dakota	5 (0.49)
South Dakota	2 (0.20)
South Atlantic	173 (16.96)
Delaware	2 (0.20)
District of Columbia	3 (0.29)
Florida	10 (0.98)
Georgia	11 (1.08)
Maryland	49 (4.80)
North Carolina	37 (3.63)
South Carolina	42 (4.12)
Virginia	9 (0.88)
West Virginia	10 (0.98)
East South Central	71 (6.96)
Alabama	2 (0.20)
Kentucky	42 (4.12)
Mississippi	5 (0.49)
Tennessee	22 (2.16)
West South Central	67 (6.57)
Louisiana	10 (0.98)
Texas	57 (5.59)
Mountain	65 (6.37)
Arizona	8 (0.78)
Colorado	30 (2.94)
Idaho	8 (0.78)
Nevada	5 (0.49)
New Mexico	12 (1.18)
Utah	2 (0.20)
Pacific	100 (9.80)
California	69 (6.76)
Hawaii	9 (0.88)
Oregon	16 (1.57)
Washington	6 (0.59)

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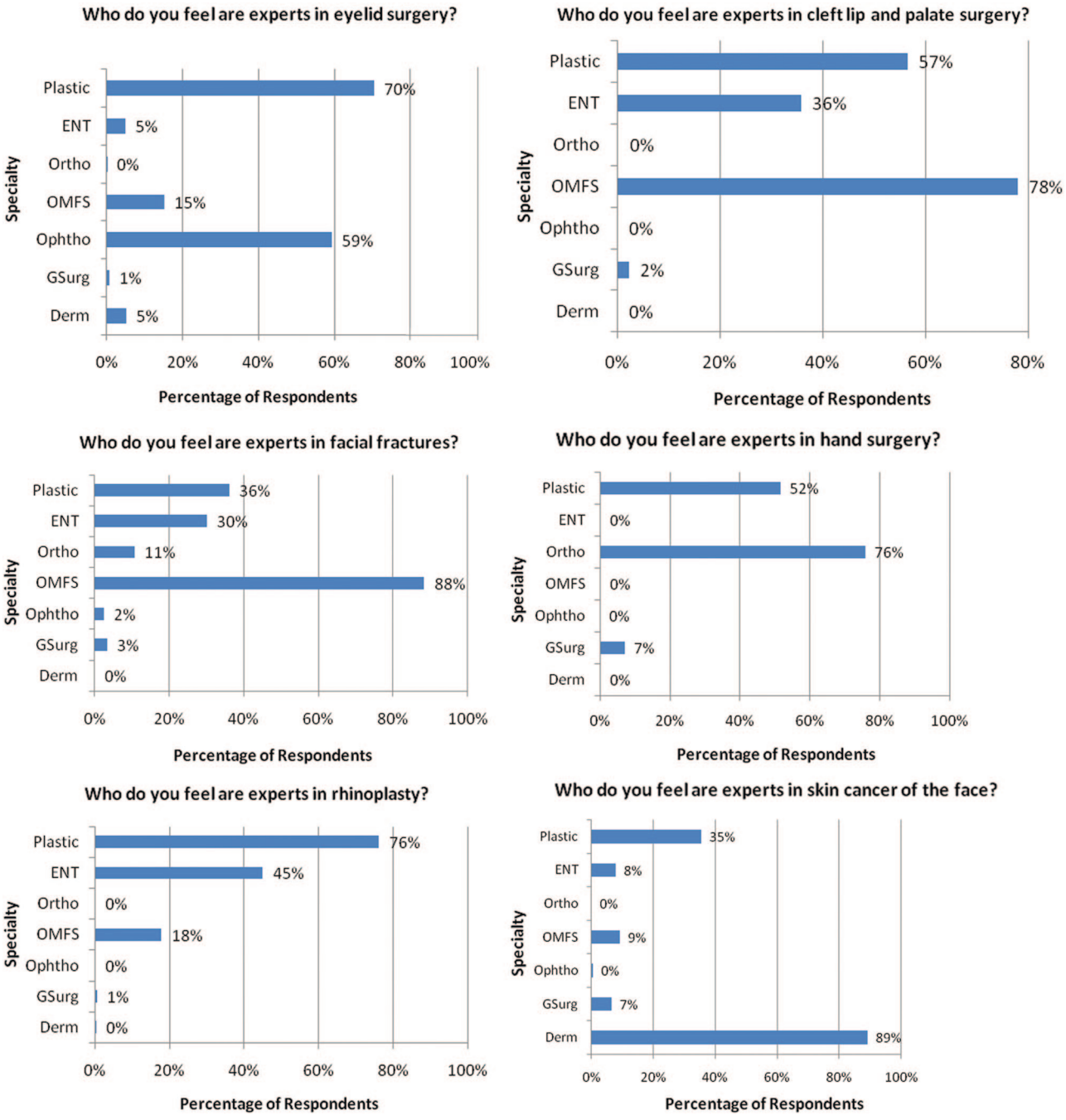

Fig. 1. Specialties considered as experts by primary care physicians for eyelid surgery (*above*, *left*), cleft lip and palate surgery (*above*, *right*), facial fractures (*center*, *left*), hand surgery (*center*, *right*), rhinoplasty (*below*, *left*), and skin cancer of the face (*below*, *right*). *Plastic*, plastic surgeon; *ENT*, otolaryngologist; *Ortho*, orthopedic surgeon; *OMFS*, oral and maxillofacial surgeon; *Ophtho*, ophthalmologist; *GSurg*, general surgeon; *Derm*, dermatologist.

76 percent for rhinoplasty, 70 percent for eyelid surgery, 57 percent for cleft lip and palate surgery, 52 percent for hand surgery, 36 percent for facial fractures, and 35 percent for skin cancer of the face. Plastic surgery was the most commonly selected specialty only for eyelid surgery and rhinoplasty (Fig. 2).

Because multiple responses were allowed, we further sought to separate response profiles based on whether they consisted only of plastic surgery, plastic surgery combined with one or more other specialties, or whether they did not include plastic surgery at all. As shown in Figure 3, for all pro-

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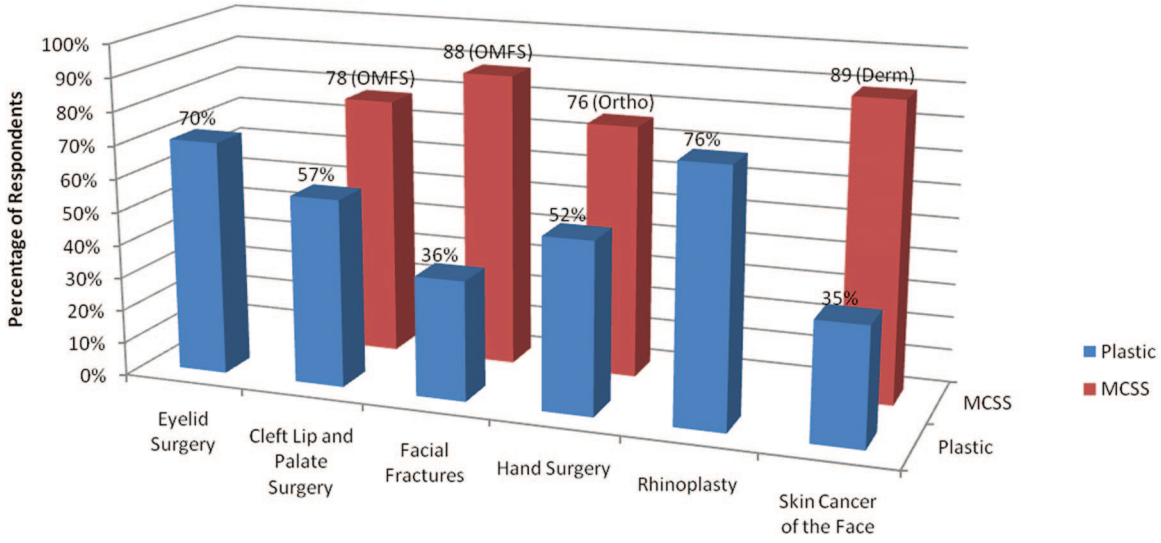

	Eyelid Surgery	Cleft Lip and Palate Surgery	Facial Fractures	Hand Surgery	Rhinoplasty	Skin Cancer of the Face
Plastic	70%	57%	36%	52%	76%	35%
MCSS		78%	88%	76%		89%

Fig. 2. The percentage of primary care physicians who selected plastic surgeons as experts in comparison with the most commonly selected specialty. Plastic surgery was the most commonly selected specialty only for eyelid surgery and rhinoplasty. *Plastic*, plastic surgeon; *Ortho*, orthopedic surgeon; *OMFS*, oral and maxillofacial surgeon; *Derm*, dermatologist.

cedures except eyelid surgery and rhinoplasty, the distribution of response profiles follows a similar pattern (no plastic surgery ≥ plastic surgery + others > plastic surgery alone).

A plot of means per specialty was determined, such that the number of questions for which a given specialty was included in the response was calculated (Fig. 4). This revealed that plastic surgery had the greatest value (3.26 ± 1.5), followed by oral and maxillofacial surgery (2.09 ± 1.0) and otolaryngology (1.24 ± 1.2) (Fig. 4).

Group mean comparisons for the total for plastic surgery reveal some noticeable patterns; the mean for women (3.40) is higher than that for men (3.06), and the mean for pediatrics (3.50) is higher than that for others (3.12). No difference in the respondent choosing plastic surgeon could be elicited when comparing the postgraduate year of training of the respondents. For the ordinal logistic regression with the total for plastic surgery as a response, gender (likelihood ratio chi-square = 12.53, $df = 1$, $p = 0.0004$), pediatrics (chi-square = 14.28, $df = 1$, $p = 0.0002$), and geographic division (chi-square = 31.49, $df = 8$, $p < 0.0001$) each had highly significant univariate effects; year ($p = 0.76$) was not significant (field was also highly significant at $p = 0.0023$). The classification variables exhibited highly significant pairwise associations, as follows: gender and division (chi-square = 17.4, $df = 8$, $p = 0.03$), division and pediatrics (chi-square = 31.23, $df = 8$, $p < 0.0001$), and gender and pediatrics (chi-square = 53.71, $df = 1$, $p < 0.0001$).

DISCUSSION

There is little published evidence on professional perceptions of plastic and reconstructive surgery and, more specifically, on perceptions of the scope of practice of plastic surgeons.[2] The goal of this study was to assess how referring primary care physicians and trainees, including general internists, pediatricians, and family practitioners, perceive the expertise of plastic and reconstructive surgeons.

We find that plastic surgeons were not always the primary specialty considered for procedures fundamental to the specialty. In addition, our results showed that plastic surgeons were often not the sole group chosen, with other specialties receiving a sizable amount of consideration. Responses from primary care physicians indicate that plastic surgeons were not considered to be the primary specialists managing cleft palate surgery,

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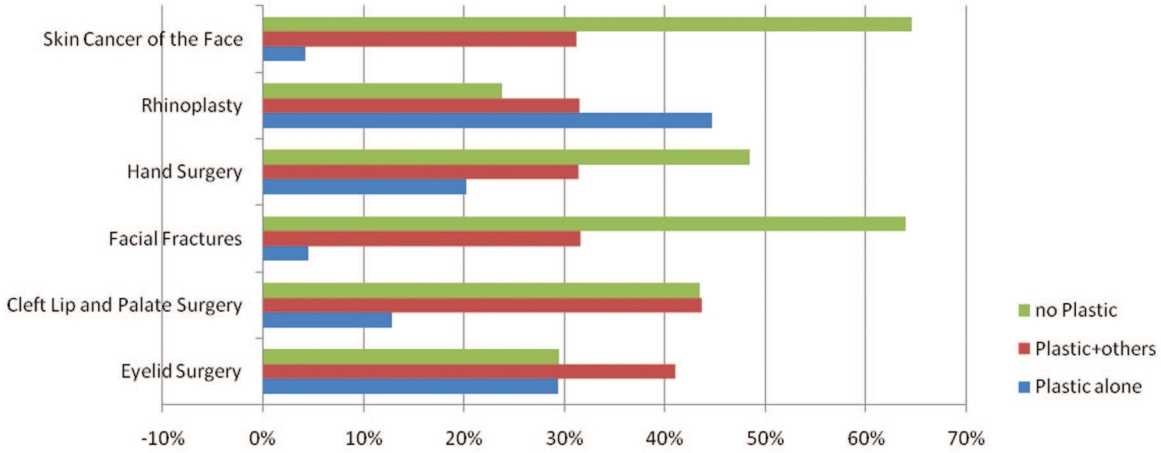
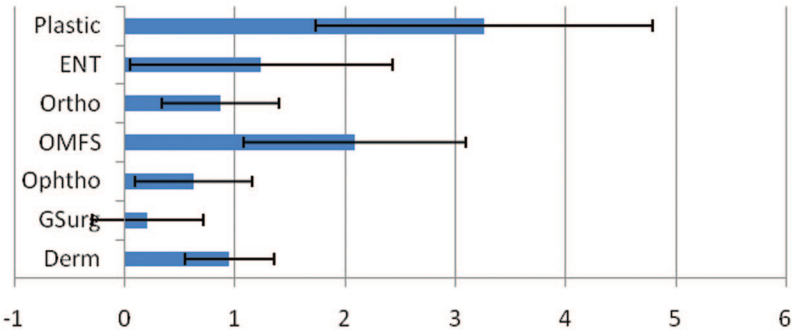


	Eyelid Surgery	Cleft Lip and Palate Surgery	Facial Fractures	Hand Surgery	Rhinoplasty	Skin Cancer of the Face
no Plastic	30%	43%	64%	48%	24%	65%
Plastic+others	41%	44%	32%	31%	31%	31%
Plastic alone	29%	13%	5%	20%	45%	4%

Fig. 3. Response profiles based on whether they consist of only plastic surgery, plastic surgery combined with one or more other specialties, or whether they do not have plastic surgery at all (*green*, no respondents listing plastic surgery as experts; *red*, respondents listing plastic surgery and others as expert; *blue*, respondents listing only plastic surgery as experts).



	Derm	GSurg	Ophtho	OMFS	Ortho	ENT	Plastic
Means	0.95	0.21	0.62	2.09	0.87	1.24	3.26

Fig. 4. The mean number of questions for which a given specialty was included in the response reveals plastic surgery with the greatest value (3.26 ± 1.5), followed by oral and maxillofacial surgery (2.09 ± 1.0) and otolaryngology (1.24 ± 1.2). *Plastic*, plastic surgeon; *ENT*, otolaryngologist; *Ortho*, orthopedic surgeon; *OMFS*, oral and maxillofacial surgeon; *Ophtho*, ophthalmologist; *GSurg*, general surgeon; *Derm*, dermatologist.

facial fractures, hand surgery, and skin cancer of the face. In fact, surveyed clinicians felt oral and maxillofacial surgeons were the primary specialists managing cleft palate and facial fractures, whereas orthopedists were leaders in hand surgery and dermatologists in treating skin cancers of the face. Of the six clinical entities presented, plastic surgery was the most commonly selected specialty only for eyelid surgery and rhinoplasty. However, in these two clinical areas, other specialists shared a considerable amount of responses. For example, in addition to 70 percent of respondents consid-

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ering plastic surgeons as experts in eyelid surgery, 59 percent chose ophthalmologists. Similarly, for rhinoplasty, whereas 76 percent considered plastic surgeons, 45 percent selected otolaryngologists and 18 percent chose oral and maxillofacial surgeons.

Primary care physicians often serve as the coordinators of care for patients. The field of plastic and reconstructive surgery relies heavily on these practitioners for referrals, especially in cases requiring reconstruction.[2] Thus, it is imperative that they understand the clinical arena of plastic surgeons so that patients can be referred properly for treatment.

From our results, it is clear that primary care physicians are poorly informed about the breadth of plastic surgery. The data specifically demonstrate the lack of knowledge primary care physicians have about the pivotal role plastic surgeons play in cleft lip and palate surgery, facial fractures, hand surgery, and skin cancer of the face. When considering gender, specialty, year of training, and geographic location of the respondents, only gender and specialty were found to influence the selection of plastic surgeons as experts. Female respondents or pediatric residents were more likely to select plastic surgeons as experts. The authors could not offer a rational explanation for the difference between genders. However, the difference among specialties could possibly be attributed to increased awareness of plastic surgery by pediatric residents participating in the care of craniofacial patients. Our proposed explanation is tempered, however, by the fact that the majority of primary care physicians considered oral maxillofacial surgeons as experts in cleft lip and palate surgery (Fig. 1, *above*, *right*).

This study examined only six clinical areas of plastic and reconstructive surgery. We suspect that the results obtained would be similar for many other procedures primarily performed by plastic surgeons. The authors believe that as a specialty, plastic and reconstructive surgeons must be better at educating their clinical colleagues about their scope of practice.

The high percentages of respondents that considered specialties other than plastic surgery also may be a reflection of increasing marketing, promotion, and education by these other specialties. Plastic surgeons, at the individual and organized membership levels, may wish to keep their promotional and educational activities commensurate with those of other specialties.[3,4]

Education of referring physicians can occur at many levels. Greater inclusion of plastic surgery in medical school curricula, either through lecture or clinical rotations, can serve as a foundation of knowledge about the scope of practice of plastic surgeons for future physicians of other specialties. It has been demonstrated that exposure of medical students to plastic surgery during their years in medical school improves their knowledge of the specialty.[5,6]

Plastic surgeons can also educate referring physicians by making themselves available to colleagues through such measures as participation in multidisciplinary meetings such as tumor boards and comprehensive cleft care teams. Furthermore, information sessions or lectures for patients and inviting primary care physicians may result in improved education of both patients and clinicians.

At the national level, plastic surgery can increase its participation in postgraduate training of residents. One way to help achieve this might be by increasing educational courses by plastic surgeons at the annual meetings of primary care physician societies such as the American College of Physicians, the American Academy of Pediatrics, and the American Academy of Family Physicians. Increased publications and review articles in these society journals could also foster increased awareness about the scope of practice of plastic surgery.

In many general and subspecialty surgical residencies, a trainee rotates through the plastic surgery service. Consideration also could be given to encourage primary care residents to spend time in the clinic setting with plastic surgeons.

CONCLUSIONS

Our study indicates that plastic surgeons were not the primary specialists considered as experts by primary care physicians for many procedures considered central to the specialty of plastic surgery. As subspecialization continues and overlap of clinical practice with other specialties increases, primary care physicians may not fully comprehend the broad clinical realm of plastic surgeons. Increased education and awareness by other physicians and the public of the procedures routinely performed by plastic surgeons will be necessary in the future.

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