# A Review of General Cosmetic Surgery Training in Fellowship Programs Offered by the American Academy of Cosmetic Surgery

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**Purpose:** We sought, first, to evaluate the operative experience of surgeons who have completed postresidency fellowships offered by the American Academy of Cosmetic Surgery (AACS), and second, to compare this cosmetic surgery training to other surgical residency and fellowship programs in the United States. Finally, we suggest how new and existing oral and maxillofacial surgeons can use these programs.

**Materials and Methods:** We reviewed the completed case logs from AACS-accredited fellowships. The logs were data mined for 7 of the most common cosmetic operations, including the median total number of operations. We then compared the cosmetic case requirements from the different residencies and fellowships.

**Results:** Thirty-nine case logs were reviewed from the 1-year general cosmetic surgery fellowships offered by the AACS from 2007 to 2012. The fellows completed a median of 687 total procedures. The median number of the most common cosmetic procedures performed was 14 rhinoplasties, 31 blepharoplasties, 21 facelifts, 24 abdominoplasties, 28 breast mastopexies, 103 breast augmentations, and 189 liposuctions. The data obtained were compared with the minimum cosmetic surgical requirements in residency and fellowship programs. The minimum residency requirements were as follows: no minimum listed for plastic surgery, 35 for otolaryngology, 20 for oral and maxillofacial surgery, 28 for ophthalmology, 0 for obstetrics and gynecology, and 20 for dermatology. The minimum fellowship requirements were as follows: 300 for the AACS cosmetic surgery fellowship, no minimum listed for facial plastic surgery and reconstruction, no minimum listed for aesthetic surgery, 133 for oculoplastic and reconstructive surgery, and 0 for Mohs dermatology.

**Conclusion:** Dedicating one's practice exclusively to cosmetic surgery requires additional postresidency training owing to the breadth of the field. The AACS created comprehensive fellowship programs to fill an essential part in the continuum of cosmetic surgeons' education, training, and experience. This builds on the foundation of their primary board residency program. The AACS fellowships are a valuable option for additional training for qualified surgeons seeking proficiency and competency in cosmetic surgery.
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Cosmetic surgery is a part of the specialty of oral and maxillofacial surgery. It is included in the curriculum of training programs and is tested by the American Board of Oral and Maxillofacial Surgery. Cosmetic surgery is an expanding and dynamic profession. More than 15 million total cosmetic procedures were performed in 2013 according to the American Society of Plastic Surgeons 2013 Plastic Surgery Statistics Report. The top 5 cosmetic surgical procedures performed are breast augmentation, rhinoplasty,

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blepharoplasty, liposuction, and facelift.[1] However, the list of surgical and nonsurgical options is extensive and blossoming with new innovations. Many medical specialties actively contribute to the field of cosmetic surgery, as documented throughout medical history. One has only to read a list of the eponyms for the surgical instruments routinely used in cosmetic procedures to understand the diversity within the field. Names such as Aufricht, Cottle, Joseph, Tessier, Klein, and Skoog are among the many famous physicians from various specialties that are well known in the arena of cosmetic surgery. These specialties include general surgery, plastic surgery, otolaryngology, maxillofacial surgery, ophthalmology, obstetrics and gynecology, and dermatology. These specialists perform cosmetic procedures to enhance their reconstructive work and actively contribute to furthering education in this field.[2-7] Cosmetic surgery is a rapidly growing field, and, with the intricacies and nuances of new technologies and procedures, it is undeniably evident that for surgeons who wish to limit their practice to cosmetic surgery, additional training is necessary outside the primary residency programs for this specialty. This will ultimately serve the patient's best interests in providing premium care and safety.

The discussion is ongoing regarding the adequacy of training required to deem surgeons competent to perform cosmetic surgery. Although the Accreditation Council for Graduate Medical Education (ACGME) residencies in the various American Board of Medical Specialties mentions incorporating cosmetic surgery into their curriculum, the training has been inadequate in many respects. Very few peer-reviewed studies evaluating the quality and quantity of training found in surgical programs that provide experience in these cosmetic procedures have been published. All these investigators have agreed that specialized and dedicated training is needed in the area of cosmetic surgery.[8-11] For example, Cueva-Galarraga et al[12] discussed this concept in their report titled "Aesthetic Plastic Surgery Training at the Jalisco Plastic and Reconstructive Surgery Institute: A 20-Year Review." They noted that graduates from their program will finish with strong procedural numbers in cosmetic operations owing to the structure of the curriculum. All residents will start their plastic surgery residency after 3 years of general surgery. In the third year of their plastic surgery residency, chief residents will act as primary surgeons in cosmetic operations. They will graduate with an average of 167 cosmetic procedures.[12] This structured year dedicated to cosmetic surgery is not the norm for current ACGME programs in the United States. Because no residency program currently exists for cosmetic surgery, a surgeon desiring more training is left with few choices to achieve competency and proficiency in this field. The choices include self-guided learning with continuing medical education, a short period of mentorship, or a structured postresidency training program in the form of a fellowship. We believe the latter will be the best option.

The American Academy of Cosmetic Surgery (AACS) currently offers 21 twelve-month fellowships in general cosmetic surgery. The AACS is committed to the development of the field of cosmetic surgery as a continuously advancing multispecialty discipline that delivers safe patient outcomes through evidence-based practice.[13] All the fellowship directors are required to be diplomates of the American Board of Cosmetic Surgery (ABCS), having undertaken and passed a rigorous oral and written examination. Initially, 2 paths were available to qualify for board certification: the experience or the fellowship route. This is no longer the case as of January 1, 2014. Now, only fellowship-trained surgeons are considered qualified to sit for the oral and written board examination given by the ABCS to obtain diplomate status. Previous board certification by way of the experience route required those physicians to document 1,000 cosmetic procedural cases with submission of 100 to 200 operative reports for review. The fellowship programs themselves must consist of no less than 2 teaching staff members. At least 1 of the teaching staff surgeons must have an academic appointment or an affiliation with an academic teaching institution or hospital. All the programs are associated with an accredited ambulatory surgery center or a hospital. The fellows must participate as co-surgeons in at least 300 cosmetic surgical procedures during the fellowship year. The fellows must also participate in the full spectrum of treatment planning, including pre- and postoperative care and the management of patient expectations and complications, that are essential to training the competent cosmetic surgeon.[14]

Many misconceptions are held by both the medical community and the public at large regarding the routes of training for surgeons who practice and specialize in cosmetic surgery.[15] The objective of our report is threefold. First, to evaluate the operative experience of surgeons who have completed postresidency fellowships offered by the AACS. Second, to compare the current cosmetic surgery training in the various surgical subspecialty residency and fellowship programs offered in the United States. Third, to suggest how these programs can be used by new and existing oral and maxillofacial surgeons (OMSs).

## Materials and Methods

The operative case logs from completed 1-year fellowships were obtained from the AACS. The data from case logs submitted from 2007 to 2012 were evaluated for both the total number of procedures and the numbers of procedures listed categorically as the most

popular cosmetic operations, as outlined previously by the 2013 American Society of Plastic Surgeon Statistics[1] (ie, breast augmentation, liposuction, facelift, blepharoplasty, and rhinoplasty). Additionally, the procedure numbers for breast mastopexy and abdominoplasty were evaluated, because these are important common procedures for a cosmetic surgeon. The median number and range for each category and the total cases were tabulated.

## Results

Of the 39 case logs reviewed from fellowships ranging from 2007 through 2012 in the study group, 6 were from women and 33 from men. The primary certification and training of the fellows included 23 general surgeons, 6 otolaryngologists, 5 oral and maxillofacial surgeons, 3 ophthalmologists, and 2 gynecologists, with no dermatologists (Table 1). The case logs represented a total of 14 fellowship programs. The median number of procedures for the common procedures and the total number of procedures is listed in Table 2. These included 189 (range 48 to 756) liposuction procedures, 103 (range 25 to 303) breast augmentations, 28 (range 4 to 140) breast mastopexies, 24 (range 2 to 120) abdominoplasties, 21 (range 6 to 65) facelifts, 31 (range 8 to 85) blepharoplasties, and 14 (range 2 to 51) rhinoplasties. The standard surgical logs warrant that liposuction cases are divided into the anatomic areas, which include the abdomen, flank, and waist, face and neck, back and buttocks, legs, and breast. The median number of total surgical cases was 687 (range 308 to 1,621). Three different reviewers independently verified these numbers.

## Discussion

Cosmetic surgery is a specialty exclusively dedicated to the enhancement of the physical appearance through surgical and medical techniques directed towards all areas of the head, neck, and body. The AACS was founded in 1985, and their mission is to advance the specialty of cosmetic surgery and quality patient care through an accredited council of professionals exclusively devoted to postgraduate education in cosmetic surgery.[13] The fellowship programs offered through the AACS are available to any physician who has completed a formal residency and has been board-certified or is board eligible in general surgery, otolaryngology, plastic surgery, oral and maxillofacial surgery, or obstetrics and gynecology. Additionally, fellowship-trained ophthalmologists and dermatologists may apply. A certifying board recognized by the American Board of Medical Specialties, American Board of Osteopathic Association's Bureau of Osteopathic Specialties, American Board of Oral-Maxillofacial Surgery, or another certifying organization deemed equivalent by the AACS must grant board certification in these specialties. Depending on the applicant's board certification and previous residency training, the applicant might be required to complete additional training (eg, additional years of general surgery or a fellowship) to qualify for the general cosmetic surgery fellowships. For example, ophthalmologists are required to complete a 2-year oculoplastic surgery fellowship before applying. Dermatologists are required to complete a surgical Mohs fellowship before applying. Both of these specialties must complete a 2-year general cosmetic surgery fellowship. It is important to point out that, in contrast to some public misconceptions, physicians from medical specialties such as emergency medicine, family practice, and internal medicine and non–fellowship-trained dermatologists, radiologists, and anesthesiologists are not eligible for AACS fellowships.[14]

The introduction of a formalized case log system as a requirement of fellowship programs offered through the AACS has garnered traceable data that document

**Table 1. BACKGROUND RESIDENCY TRAINING OF FELLOWS' CASE LOGS**

| Certification and Residency Background | AACS Fellows (n) |
|---|---|
| General surgery | 23 |
| Otolaryngology | 6 |
| Oral and maxillofacial surgery | 5 |
| Ophthalmology | 3 |
| Obstetrics and gynecology | 2 |
| Dermatology | 0 |

Abbreviation: AACS, American Academy of Cosmetic Surgery.

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**Table 2. MEDIAN NUMBER OF MOST COMMON COSMETIC PROCEDURES AND TOTAL NUMBER OF COSMETIC PROCEDURES**

| Surgical Procedures | Cases Per Surgeon (n) |
|---|---|
| Liposuction | 189 (48-756) |
| Breast augmentation | 103 (25-303) |
| Breast mastopexy | 28 (4-140) |
| Abdominoplasty | 24 (2-120) |
| Blepharoplasty | 31 (8-85) |
| Facelift | 21 (6-65) |
| Rhinoplasty | 14 (2-51) |
| Total | 687 (308-1,621) |

Data presented as median (range).

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each fellow's surgical experience. These data were not previously accessible, although AACS fellowships have been in existence for longer than 20 years. Each fellow must participate as the surgeon or co-surgeon in a minimum of 300 cases, with at least 50 cases represented from the following 4 categories: facial cosmetic surgery, body or extremity contouring, breast cosmetic surgery, and dermatologic cosmetic surgery[14] (see Appendix 1 for a comprehensive list of the procedures performed during the fellowship). Dermatologic cosmetic procedures, such as chemical peeling and laser resurfacing, are rarely experienced during traditional surgical residency programs. Additionally, cosmetic surgery fellows participate in the full spectrum of pre- and postoperative care, including management of patient expectations and complications, essential to training the competent cosmetic surgeon.

Medical education and training in the United States is structured as a continuum, with each level building on the physician's previous education and training. Physicians are typically required to complete 1 to 3 years of graduate medical education before they can be licensed to practice medicine. Residencies vary in length, with most lasting 3 to 5 years. In general, residency programs are designed to provide students with demanding, progressive, and supervised education, training, and experience to prepare them for independent practice. The residency programs accredited by the ACGME, American Osteopathic Association Bureau of Osteopathic Specialists, or the ACGME–American Dental Association programs for the integrated OMS-MD physician have been structured to ensure students learn and demonstrate competency in *1)* patient care, *2)* medical knowledge, *3)* practice-based learning and improvement, *4)* interpersonal and communication skills, *5)* professionalism, and *6)* systems-based practice. All these aspects constitute the core competencies. All physicians, as a prerequisite, must have qualified for and achieved board certification according to these requirements before pursuing advanced training in a general cosmetic surgery fellowship.[14]

With respect to the adequacy of training required for surgeons to perform cosmetic procedures, supervised repetition is the cornerstone of developing the skills that will achieve excellent results. This principle has been proved in many surgical subspecialties. Undeniably, a high volume of training and practice performed within a narrow field will result in vastly improved outcomes. Evidence supporting this includes data from colorectal surgery, pancreatic surgery, esophageal surgery, urological cancer surgery, bariatric surgery, and various vascular and thoracic surgical procedures.[16-25] Although the core curriculum and basic skills can be achieved in all surgical residency programs, additional training to ensure high-volume repetition is essential to developing a mastery of any subspecialty. This is the basis for the existence of fellowship programs. It would be less than ideal to perform the broad array of procedures required in a cosmetic surgery practice having only completed a surgical residency.

Thus, the question must be asked, what are the current requirements or training of residents and/or fellows within cosmetic surgery? Morrison et al[11] found that more than 50% of plastic surgery program directors encouraged their residents to pursue some type of postgraduate cosmetic fellowship. In addition, 70% of the senior plastic surgery residents desired additional experience in rhinoplasty and nearly 50% believed they needed more experience with facelifts, chemical peels, and laser resurfacing. Furthermore, plastic surgery residents were most comfortable performing aesthetic surgery of the breast and trunk and believed they were least prepared for and most vulnerable with complex facial aesthetic surgery. In the same study, 36% of the plastic surgery residents reported that a cosmetic fellowship would be helpful after their residency. Also discussed in their report was reference to the recommended minimum case requirement for cosmetic surgical procedures as directed by the ACGME in plastic surgery.[11] They are as follows: 10 breast augmentations,7 facelifts, 8 blepharoplasties, 6 rhinoplasties, 5 abdominoplasties, 10 suction lipectomies, and 9 "other" cosmetic procedures, totaling 55 cosmetic surgical procedures.[11]

As a follow-up study, Oni et al[10] published "Cosmetic Surgery Training in Plastic Surgery Residency Programs in the United States: How Have we Progressed in the Last Three Years?" Their purpose was to elucidate how plastic surgery training has changed since the report by Morrison et al.[11] Oni et al[10] found that fewer programs offered specific cosmetic surgery rotations in 2009 compared with 2006. A total of 117 senior resident surveys were collected. Overall, 56.7% of the residents were "satisfied or "very satisfied" with their cosmetic surgery training, and 31% of the residents believed a cosmetic fellowship was necessary.[10]

Plastic surgery residents can continue their aesthetic surgery training by partaking in an aesthetic surgery fellowship through the American Society of Aesthetic Plastic Surgery (ASAPS). A total of 21 fellowships are offered, of which only 10 have been endorsed by the ASAPS. The meaning of this endorsement has not been explained on the ASAPS's website. Fellowships range from 6 months to 1 year.[26] Plastic surgery residents can also matriculate through general cosmetic surgery fellowships through the AACS. Cosmetic surgery is only a small part of plastic surgery residency training, which encompasses 3 years of general surgery followed by various aspects of reconstructive surgery, including burns, reconstruction with flaps and grafts, craniofacial surgery, microsurgery, and hand surgery in newer integrated programs.

From our case log analysis of general cosmetic surgery fellowships, AACS fellows will meet and exceed the minimum requirements documented for other residency and fellowship surgical specialties[27-33] (Tables 3, 4). Ideally, the AACS case logs should be compared with the case logs from the other residencies and fellowships; however, those are not publically available or published. As health professionals, it is our ultimate goal to provide the best care possible in a safe manner to our patients. According to the house of delegates of the American Medical Association, when it comes to privileges in the hospital, the best interest of the patient should be the predominant consideration.[34-36] The accordance and delineation of privileges should be determined on an individual basis, commensurate with an applicant's education, training, experience, and demonstrated current competence.[37] In implementing these criteria, each facility should formulate and apply reasonable, nondiscriminatory standards for the evaluation of an applicant's credentials, free of anticompetitive intent or purpose.[34,35] The Joint Commission on Hospital Accreditation and Medicare require similar standards for hospital privileging.[37] This speaks to the truth that surgeons are not born with the skills necessary to perform cosmetic surgery. They acquire the proper knowledge and skills over many years through education, training, and experience.[36] Residency and fellowship programs have their own characteristics that determine their relative strengths and weaknesses. Thus, each resident and fellow could have had very different experiences. The general cosmetic surgery fellowships offered through the AACS provide comprehensive training in cosmetic surgery in a setting that promotes the safety and quality of patient care.

Future studies of AACS cosmetic surgery fellowships will include surveys of each graduated fellow to evaluate their postgraduate comfort level with the different cosmetic surgical procedures. Additionally, it will be important to record the median number of procedures and what this represents for AACS fellowships. Most fellows will have great case numbers, as reflected by the median. The range also reflects some outliers, as evidenced by the number of rhinoplasty and breast mastopexy procedures performed. AACS fellowships are constantly evolving by way of feedback from program directors and their fellows, adding additional faculty and exposure to ensure the broad training that each fellow requires to be a competent and confident cosmetic surgeon. This is evident by the increasing number of fellowships. At the time of our data collection, 14 fellowship programs existed; now, 21 fellowship programs are available.

Currently, a limited number of programs are available to oral and maxillofacial surgeons, ophthalmologic surgeons, and dermatologic surgeons who wish to further their knowledge, experience, and training in facial cosmetic surgery. The AACS is in the process of developing facial cosmetic surgery training programs for which both single- and dual-degree oral and maxillofacial surgeons can apply. In addition, those individuals with a medical degree may apply and attend one of the general cosmetic surgery fellowship programs. Both programs will provide educational opportunities that allow surgeons to develop practices that focus on cosmetic surgery. Also, many national and local meetings cover general cosmetic and facial cosmetic surgery topics, and at least 1 journal is focusing on cosmetic surgery. Collaboration between the AACS and oral and maxillofacial surgeons will help to provide quality educational experience for cosmetic surgeons now and in the future.

In conclusion, the specialty of cosmetic surgery is rapidly growing and should be viewed as an independent specialty in the medical and surgical community. Many surgeons and graduating residents wish to limit their

**Table 3. MINIMUM COSMETIC SURGICAL PROCEDURE REQUIREMENTS FOR PRIMARY TRAINING PROGRAMS**

| Residency Program | Minimum Cosmetic Surgical Procedures (n) |
|---|---|
| Plastic surgery* | 55[11] |
| Otolaryngology* | 35[27] |
| Oral and maxillofacial surgery† | 20[28] |
| Ophthalmology* | 28[29] |
| Obstetrics and gynecology | 0[30] |
| Dermatology* | 0[31] |

* Accreditation Council for Graduate Medical Education.
† Commission on Dental Accreditation.

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**Table 4. MINIMUM COSMETIC SURGICAL PROCEDURE REQUIREMENT FOR FELLOWSHIP PROGRAMS**

| Fellowship Program | Minimum Cosmetic Surgical Procedures Required (n) |
|---|---|
| Cosmetic surgery (AACS) | 300[14] |
| Facial plastic and reconstructive surgery | NA |
| Aesthetic plastic surgery | NA |
| Oculoplastic and reconstructive surgery | 133[32] |
| Mohs dermatology | 0[33] |

Abbreviations: AACS, American Academy of Cosmetic Surgery; NA, not applicable (no minimum case number listed on the fellowship or academy website).

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practice to cosmetic surgery; however, currently, no ACGME residency programs in the United States have been devoted exclusively to cosmetic surgery. The residency programs in general surgery, plastic surgery, otolaryngology, oral and maxillofacial surgery, obstetrics and gynecology, ophthalmology, and dermatology do not include adequate training to render a physician fully competent and proficient to perform the vast array of cosmetic surgery procedures. Recognizing that practitioners seeking to limit their practice to cosmetic surgery required additional postresidency specialized education and training, the AACS encouraged the creation of comprehensive programs to fill an essential part of the continuum of cosmetic surgeons education, training, and experience.[13] These fellowships are a valuable option for additional training for qualified surgeons seeking to become competent and proficient in cosmetic surgery.

## References


1. American Society of Plastic Surgeons: 2012 Plastic Surgery Statistics Report. Arlington Heights, IL, ASPS National Clearinghouse of Plastic Surgery Procedural Statistics, 2013
2. Belinfante LS: History of rhinoplasty. Oral Maxillofac Surg Clin North Am 24:1, 2012
3. Dolsky RL: Cosmetic surgery in the United States: Its past and present. Dermatol Surg 25:886, 1999
4. Flynn TC, Coleman WP II, Field LM, et al: History of liposuction. Dermatol Surg 26:515, 2000
5. Klein JA: Tumescent technique for regional anesthesia permits lidocaine doses of 35 mg/kg for liposuction. J Dermatol Surg Oncol 16:248, 1990
6. Klein JA: Tumescent technique for local anesthesia improves safety in large-volume liposuction. Plast Reconstr Surg 92: 1085, 1993
7. Zeichner JA, Sadick N: A history of lasers in dermatologic surgery. Am J Cosmet Surg 25:237, 2008
8. Sterodimas A, Boriani F, Bogetti P, et al: Junior plastic surgeon's confidence in aesthetic surgery practice: A comparison of two didactic systems. J Plast Reconstr Aesthet Surg 63:1335, 2010
9. Rohrich RJ: The importance of cosmetic plastic surgery education: An evolution. Plast Reconstr Surg 105:741, 2000
10. Oni G, Ahmad J, Zins JE, Kenkel JM: Cosmetic surgery training in plastic surgery residency programs in the United States: How have we progressed in the last three years? Aesthet Surg J 31:445, 2011
11. Morrison CM, Rotemberg SC, Moreira-Gonzalez A, Zins JE: A survey of cosmetic surgery training in plastic surgery programs in the United States. Plast Reconstr Surg 122:1570, 2008
12. Cueva-Galarraga M, Cardenas-Camarena L, Boquin M, et al: Aesthetic plastic surgery training at the Jalisco Plastic and Reconstructive Surgery Institute: A 20-year review. Plast Reconstr Surg 127:1346, 2011
13. About Us. Available at: http://www.cosmeticsurgery.org/?page=About; 2014. Accessed January 7, 2015.
14. American Academy of Cosmetic Surgery: Guidelines for Clinical Fellowship Training in Cosmetic Surgery. Available at: http://www.cosmeticsurgery.org/education/fellowship_guidelines.pdf; 2009. Accessed January 7, 2015.
15. Hamilton GS III, Carrithers JS, Karnell LH: Public perception of the terms "cosmetic," "plastic," and "reconstructive" surgery. Arch Facial Plast Surg 6:315, 2004
16. Bilimoria KY, Phillips JD, Rock CE, et al: Effect of surgeon training, specialization, and experience on outcomes for cancer surgery: A systematic review of the literature. Ann Surg Oncol 16:1799, 2009
17. Birkmeyer JD, Stukel TA, Siewers AE, et al: Surgeon volume and operative mortality in the United States. N Engl J Med 349:2117, 2003
18. Birkmeyer JD, Warshaw AL, Finlayson SR, et al: Relationship between hospital volume and late survival after pancreaticoduodenectomy. Surgery 126:178, 1999
19. Dimick JB, Cattaneo SM, Lipsett PA, et al: Hospital volume is related to clinical and economic outcomes of esophageal resection in Maryland. Ann Thorac Surg 72:334, 2001
20. Harmon JW, Tang DG, Gordon TA, et al: Hospital volume can serve as a surrogate for surgeon volume for achieving excellent outcomes in colorectal resection. Ann Surg 230:404, 1999
21. Joudi FN, Konety BR: The impact of provider volume on outcomes from urological cancer therapy. J Urol 174:432, 2005
22. Karanicolas PJ, Dubois L, Colquhoun PH, et al: The more the better? The impact of surgeon and hospital volume on in-hospital mortality following colorectal resection. Ann Surg 249:954, 2009
23. Nguyen NT, Paya M, Stevens CM, et al: The relationship between hospital volume and outcome in bariatric surgery at academic medical centers. Ann Surg 240:586, 2004
24. Pearce WH, Parker MA, Feinglass J, et al: The importance of surgeon volume and training in outcomes for vascular surgical procedures. J Vasc Surg 29:768, 1999
25. Prystowsky JB, Bordage G, Feinglass JM: Patient outcomes for segmental colon resection according to surgeon's training, certification, and experience. Surgery 132:663, 2002
26. American Society of Aesthetic Plastic Surgery: ASAPS Registered Fellowship List, 2013. Available at: http://www.surgery.org/professionals/residents/aesthetic-fellowships. Accessed January 7, 2015.
27. Required Minimum Number of Key Indicator Procedures for Graduating Residents Review Committee for Otolaryngology. Available at: http://www.acgme.org/acgmeweb/Portals/0/PFAssets/ProgramResources/280_Required_Minimum_Number_of_Key_Indicator_Procedures.pdf; 2013. Accessed January 7, 2015.
28. Accreditation Standards for Advanced Specialty Education Programs in Oral and Maxillofacial Surgery. Available at: http://www.aaoms.org/docs/residency/oms_standards.pdf; 2013. Accessed January 7, 2015.
29. Required Minimum Number of Procedures for Graduating Residents in Ophthalmology Review Committee for Ophthalmology. Available at: http://www.acgme.org/acgmeweb/Portals/0/PFAssets/ProgramResources/240_Oph_Minimum_Numbers.pdf; 2013. Accessed January 7, 2015.
30. Required Minimum Number of Key Indicator Procedures for Graduating Residents Review Committee for Obstetrics and Gynecology. Available at: http://www.acgme.org/acgmeweb/Portals/0/PFAssets/ProgramResources/220_Ob_Gyn Minimum_Numbers_Announcment.pdf; 2013. Accessed January 7, 2015.
31. Case Requirements for Residents Beginning Residency on or After July 1, 2013—Review Committee for Dermatology. Available at: http://dconnect.acgme.org/acgmeweb/Portals/0/PFAssets/ProgramResources/080_Minimum_Numbers.pdf; 2013. Accessed January 7, 2015.
32. American Society of Ophthalmic Plastic and Reconstructive Surgery Surgical Log. Available at: http://www.asoprs.org/i4a/pages/index.cfm?pageid=3714; 2013. Accessed January 7, 2015.
33. Policies, Procedures and Guidelines of the Fellowship Training Programs of the ACMS. Available at: http://www.mohscollege.org/sisrb/FTPPoliciesProceduresGuidelines.pdf; 2013. Accessed January 7, 2015.
34. H-230.976 Economic Credentialing. Available at: http://www.ama-assn.org/ama/pub/about-ama/our-people/house-delegates/policy-finder-online.page; 2007. Accessed January 7, 2015.
35. H-230.975 Economic Credentialing. Available at: http://www.ama-assn.org/ama/pub/about-ama/our-people/house-delegates/policy-finder-online.page; 2007. Accessed January 7, 2015.
36. Policy H-230.994 Encouragement of Open Hospital Medical Staffs. Available at: http://www.ama-assn.org/ama/pub/about-ama/our-people/house-delegates/policy-finder-online.page; 2008. Accessed January 7, 2015.
37. Medical Staff (CAMH/Hospitals)—Core/Bundled Privileges. Available at: http://www.jointcommission.org/mobile/standards_information/jcfaqdetails.aspx?StandardsFAQId=42&StandardsFAQChapterId=74; 2008. Accessed January 7, 2015.

**Appendix Table 1: List of Surgical Procedures**

| |
|---|
| Face |
| Brow lifts (endoscopic, coronal, direct, trichophytic, pretrichial) |
| Chin implants |
| Closed rhinoplasty |
| Facelifts (deep plane, facial tuck, sub-SMAS, minimal incision) |
| Fat grafting to face (all areas) |
| Forehead lifts |
| Genioplasty |
| Hair lift |
| Hair transplant flaps |
| Lower blepharoplasty (transconjunctival and subcilliary) |
| Liposuction of neck/jowl |
| Hair transplant grafts |
| Malar implants |
| Mandibular osteotomy |
| Maxillary osteotomy |
| Midface lift (open and endoscopic) |
| Neck lift (with or without platysmal plication) |
| Open rhinoplasty (with or without osteotomies, tip work) |
| Otoplasty (cartilage cutting, cartilage sparing) |
| Ptosis repair |
| Scalp extension |
| Scalp reduction |
| Upper blepharoplasty |
| Lip augmentation |
| Lip reduction |
| Surgical scar revision |
| Dermatology |
| Chemical peeling (superficial, medium, deep) |
| Dermabrasion |
| Laser resurfacing (carbon dioxide and fractional carbon dioxide) |
| Subdermal fillers (hyaluronic acid, hydroxyapatite, Sculptra) |
| Neurotoxin (Botox, Dystport, Xeomin) |
| Acne treatment |
| Breast |
| Breast augmentation (transaxillary, periareolar, inframammary, transumbilical) |
| Fat grafting to breast |
| Mastopexy (crescent, circumareolar, vertical, inverted T) |
| Reduction mammoplasty (superior, inferior, superomedial) |
| Mastopexy with augmentation (crescent, circumareolar, vertical, inverted T) |
| Nipple reduction |
| Surgical scar revision |
| Body and extremity |
| Abdominoplasty (with or without rectus plication, extended) |
| Body lifting (after bariatric surgery) |
| Brachioplasty |
| Calf implants |
| Dermolipectomy (with or without deep liposuction) |
| Fat grafting, body |
| Fat grafting, buttocks |
| Gluteal implants |
| Laser liposuction |
| Panniculectomy |
| Pectoral implants |
| Power-assisted liposuction |
| Buttock lift |
| Thigh-plasty |
| Ultrasound liposuction |
| Vaginoplasty |
| Varicose vein surgery |
| Mons lifting |
| Gynecomastia (liposuction, direct excision, lifting) |
| Upper body lift |
| Surgical scar revision |

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