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Carol Brown (cbrown)  
1050 East South Temple  
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## The impact of laparoscopic bariatric workshops on the practice patterns of surgeons

J. L. Lord,<sup>1</sup> D. R. Cottam,<sup>2</sup> R. M. Dallal,<sup>3</sup> S. G. Mattar,<sup>4</sup> A. R. Watson,<sup>5</sup> J. M. Glasscock,<sup>6</sup> R. Ramanathan,<sup>5</sup> G. M. Eid,<sup>5</sup> P. R. Schauer<sup>7</sup>

<sup>1</sup> Sacred Heart Institute for Surgical Weight Loss, Pensacola, Florida

<sup>2</sup> Surgical Weight Control Center, Las Vegas, Nevada

<sup>3</sup> Albert Einstein Healthcare Network, Philadelphia, PA

<sup>4</sup> Indiana University, Indianapolis, Indiana

<sup>5</sup> University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania

<sup>6</sup> Sartori Memorial Hospital, Cedar Falls, Iowa

<sup>7</sup> The Cleveland Clinic, Cleveland, Ohio

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### Abstract

**Background:** This study was designed to evaluate the impact of a 2-day laparoscopic bariatric workshop on the practice patterns of participating surgeons.

**Methods:** From October 1998 to June 2002, 18 laparoscopic bariatric workshops were attended by 300 surgeons. Questionnaires were mailed to all participants.

**Results:** Responses were received from 124 surgeons (41%), among whom were 56 bariatric surgeons (open) (45%), 30 advanced laparoscopic surgeons (24%), and 38 surgeons who performed neither bariatric nor advanced laparoscopic surgery (31%). The questionnaire responses showed that 46 surgeons (37%) currently are performing laparoscopic gastric bypass (LGB), 38 (31%) are performing open gastric bypass, and 39 (32%) are not performing bariatric surgery. Since completion of the course, 46 surgeons have performed 8,893 LGBs (mean, 193 cases/surgeon). Overall, 87 of the surgeons (70%) thought that a limited preceptorship was necessary before performance of LGB, yet only 25% underwent this additional training. According to a poll, the respondents thought that, on the average, 50 cases (range, 10–150 cases) are needed for a claim of proficiency.

**Conclusion:** Laparoscopic bariatric workshops are effective educational tools for surgeons wishing to adopt bariatric surgery. Open bariatric surgeons have the highest rates of adopting laparoscopic techniques and tend to participate in more adjunctive training before

performing LGB. There was consensus that the learning curve is steep, and that additional training often is necessary. The authors propose a mechanism for post-residency skill acquisition for advanced laparoscopic surgery.

**Key words:** Bariatric surgery — Course — Laparoscopic skills — Obesity — Training — Workshop

The introduction of advanced laparoscopic surgery during the past decade has ushered in a new era of surgical training requirements necessitating novel teaching paradigms, as compared with those classically structured by William Halsted [9]. The workshop concept introduced in 1977 is one such method for teaching practicing surgeons new techniques, and it has gained in importance [2]. The initial concerns over adequacy of training grew after reports of severe complications after the rapid and widespread adoption of laparoscopic cholecystectomy [10, 19, 21, 23, 24]. Concerns over the appropriateness of short training courses designed primarily to teach new surgical techniques are especially appropriate in the technically challenging field of laparoscopic bariatric surgery [15, 20]. There is no information to date regarding the efficacy of workshops in the training of advanced laparoscopic techniques needed for bariatric surgery [22].

Laparoscopic gastric bypass (LGB) represents a formidable challenge for the general surgeon. Performance standards for bariatric surgery remain perhaps the highest for any subdivision of general surgery [13]. As such, the International Federation for the Surgery of Obesity has developed strict requirements for bariatric

**Table 1.** The 2-day laparoscopic bariatric workshop

Function	Hours	
Lectures	4 Hrs	Obesity is a surgical disease Medical and surgical treatment of obesity Perioperative management Operative principles of bariatric surgery Laparoscopic restrictive procedures Laparoscopic gastric bypass
Lab	3.5 Hrs	Porcine lab/equipment familiarization
Q&A	0.5 Hrs	Questions and Answers
Function	Hours	
Live Cases	4 Hrs	Laparoscopic bypass and banding
Lectures	3.5 Hrs	Essentials of bariatric surgery Reoperative bariatric surgery Debate: banding vs bypass Challenging cases
Q&A	0.5 Hrs	Questions and Answers

\*The workshop comprised 7.5 h of didactic lectures on bariatric principles and techniques, with panel discussions, 1/2 h of operating room equipment familiarization, a 3-h porcine animal lab, 4 h of viewing live surgery (3 cases), and 1 h for questions and answers

workshops to limit inadequate, misleading, or incomplete training [1].

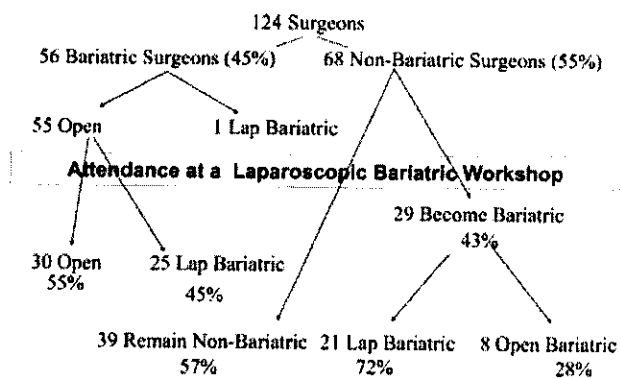
With this in mind, we ask what influence attending a 2-day laparoscopic bariatric workshop course has on the rate of LGB adoption into one's surgical practice. Accordingly, this study was designed to collect questionnaire data from various types of surgeons who have attended a structured, introductory laparoscopic bariatric workshop, and to determine its influence on their surgical practice.

## Materials and methods

From October 1998 to June 2002, 18 introductory laparoscopic bariatric workshops were organized at the Center for Minimally Invasive Surgery of the University of Pittsburgh School of Medicine. This program was sponsored by the Center for Continuing Medical Education in the Health Sciences. The program was designed to teach surgeons with no previous laparoscopic experience the basics of laparoscopic bariatric surgery. The course was not designed or advertised as a means to certify competency.

A total of 300 surgeons from 10 countries and 36 states attended the 2-day training course. The components of the courses are depicted in Table 1. The faculty was composed of 10 nationally established bariatric surgeons experienced in varied laparoscopic techniques. The course participants were given a course syllabus and access to additional training videos. At completion of the course, the participants were expected to be familiar with laparoscopic instrumentation and fundamental techniques necessary for the safe performance of laparoscopy. The participants were advised to practice laparoscopic skills in an animal laboratory and to engage in one-on-one supervised clinical preceptorships before performing laparoscopic bariatric surgery independently. In addition, program attendees were encouraged to use their personal and professional judgment when considering further application of the material taught.

In August 2002, the participants were mailed questionnaires designed to assess their laparoscopic bariatric experience since attending the course. Three different attempts at communication (general mailing, facsimile, and email) were used to recover the data sets. The survey consisted of demographic data, training experience before and after course completion, evaluation of course content, and questions pertaining to operative experience. Questions pertaining to complications were excluded for the purpose of surgeon anonymity, and a cover letter



**Fig. 1.** Of the 124 surgeons who responded to the questionnaire, 45% of the bariatric surgeons became laparoscopic bariatric surgeons, 43% of the nonbariatric surgeons became bariatric surgeons, and 57% of the nonbariatric surgeons remain nonbariatric in their practice.

accompanying the questionnaire assured respondents of confidentiality. Descriptive and correlative information was derived from the response data set.

## Results

A total of 124 completed questionnaires (41%) were received from the 300 surgeons who attended the 2-day laparoscopic bariatric workshops. Most of the surgeons (79%) attended the course to begin preparations for performing laparoscopic bariatric techniques.

The composition of the responding surgeons before the course is recorded in Fig. 1. The surgeons also participated in a large number of other training activities before performing LGB in patients with 73 (59%) observing additional live surgery, 61 (49%) participating in laparoscopic bariatric animal procedures, 58 (47%) observing additional videos, 50 (40%) taking additional training courses at outside institutions, and 41 (33%) participating in dry skills labs (laparoscopic trainers). These prerequisites were demonstrated, respectively, by 104 (84%) and 107 (86%) of the responding surgeons.

Some type of preceptorship before the performance of bariatric surgery was thought necessary by 70% of the respondents. The recommended duration are detailed in Fig. 2. However, despite the belief that people should participate in preceptorships, only 25% had attended some type of preceptorship, and 87% of the preceptorships were shorter than 1 week. Open bariatric surgeons attended the most preceptorships and achieved the highest laparoscopic adoption rates (Fig. 3). Surgeons who already were laparoscopic surgeons rarely attended preceptorships, but a high percentage became bariatric surgeons (open or laparoscopic) (Fig. 4).

It was thought by 93 of the surgeons (75%) that bariatric surgery was more acceptable at the completion of the course. The most useful parts of the course included the identification and treatment of complications, the use of new instrumentation, and surgical demonstrations (video or live). The course seemed very effective in assisting surgeons with their transition to LGB, as evidenced by the high numbers performing LGB after completion of the course (Table 2).

### Recommended Duration of Preceptorship

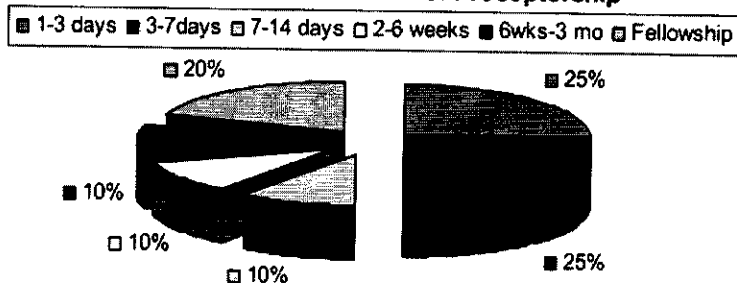


Fig. 2. Of 87 respondents, 25% thought that a 1- to 3-day preceptorship was sufficient, 25% thought that 3 to 7 days was sufficient, 10% thought that 7 to 14 days was sufficient, 10% thought that 2 to 6 weeks was sufficient, and 20% thought that a formal 1-year fellowship was required.

### Adoption of LGB by Surgeon Subgroup

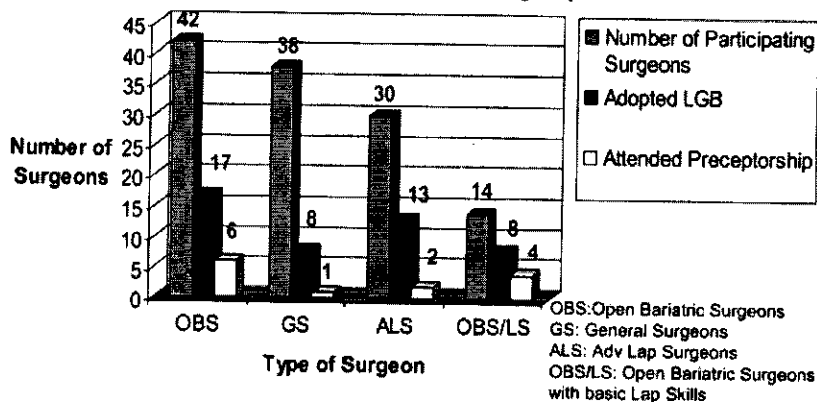
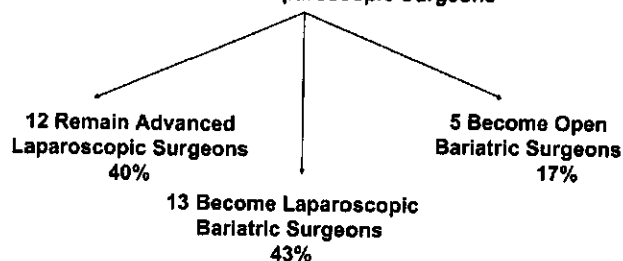


Fig. 3. Open bariatric surgeons (OBS) represented the largest subgroup of the surgeons attending laparoscopic bariatric workshops. Open bariatric surgeons had the highest rates for adopting laparoscopic gastric bypass (LGB) and attended the most preceptorships. GS, general surgeons; ALS, advanced laparoscopic surgeons; OBS/LS, open bariatric surgeons with basic laparoscopic skills.

### 30 Advanced Laparoscopic Surgeons



60% of Advanced Laparoscopic Surgeons Become Bariatric Surgeons

Fig. 4. A total of 30 advanced laparoscopic surgeons attended the bariatric workshops, with 60% becoming bariatric surgeons.

Altogether, 82 of the surgeon respondents have attempted at least one LGB, and the responding surgeons as a whole have performed 9,071 LGB and 280 laparoscopic adjustable bands. The average surgeon has performed 193 laparoscopic bariatric procedures.

Reported performance data showed that the mean rates for conversion from laparoscopic to open bypass among the 46 responding surgeons who adopted LGB were 1% to 2% (30 surgeons), 2% to 5% (13 surgeons), and 10% (3 surgeons). This same cadre of surgeons also had remarkably low self-reported operative times (mean, 138 min; range, 55-240 min). When the group was broken down into the surgeons who had performed more than 50 and those who had performed fewer than 50 operations, the operative times varied by only 6 min.

Surprisingly, only 67 of the responding surgeons (54%) were members of either the Society of American

Table 2. Adoption rate of LGB

	Before Course n (%)	After Course n (%)
Open Bariatric Surgeons	55 (44)	38 (31)
Non Bariatric Surgeons	68 (55)	39 (31)
LGB Surgeons	1 (0.8)	47 (38)
Total	124	124

Open and non Bariatric surgeon depend on LGB was adopted

Gastrointestinal and Endoscopic Surgeons (SAGES) or the American Society of Bariatric Surgeons (ASBS), and 23 (19%) did not plan ever to perform LGB.

### Discussion

The past decade has witnessed an explosion in the development of advanced laparoscopic surgical techniques [17]. The primary purpose of this study was to evaluate the effect that bariatric workshops have on clinical practice.

Currently, 94 laparoscopic fellowships exist in the United States. In an effort to assist this growing demand for postgraduate training, focused workshops have been created. The average surgical resident will not be exposed to the technical skills necessary for becoming proficient in laparoscopic bariatric surgery. A recent survey demonstrated that as many as 65% of surgical

residents would pursue an additional year of advanced laparoscopic training if it were available [14]. There is a general consensus that specialized training courses improve the technical skills necessary for performing new techniques [11]. Furthermore, these courses underscore the belief that gains in knowledge lead physicians to improve the way they practice and thus improve patient outcomes. An earlier study demonstrated that the rate of complications associated with the clinical learning curve could be decreased 3.39-fold by additional education after an initial course in laparoscopy [21].

Purely didactic courses, however, do not appear to be effective in changing physician performance [4]. Additionally, data from several studies not specific to bariatric surgery, but to laparoscopy in general [10–12, 15, 17] suggest that optimal clinical performance, primarily determined by complication rates, cannot be attained during a single postresidency instructional course.

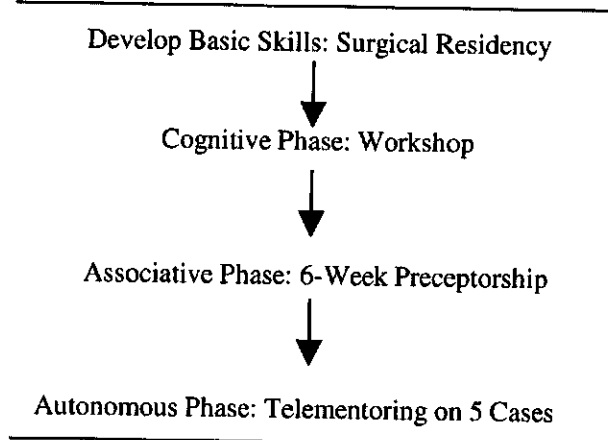
Dent [5, 6] believed that the surgical leaders should determine what constitutes adequate training for granting appropriate hospital privileges. In addition, a widening body of knowledge continues to establish what constitutes the appropriate learning curve for the various types of advanced laparoscopic procedures currently offered [4].

Currently, SAGES [8] has an established framework of guidelines for postresidency surgical education and training. It has been shown that those who attend approved SAGES workshops significantly improve their laparoscopic skills, and that attending formal training courses is a predictive factor in decreasing complications associated with laparoscopy [3].

The data obtained from this study confirm that bariatric workshops do assist surgeons in transitioning from open bariatric surgery to laparoscopic bariatric surgery (Table 2). In addition, the data show that although a significant number of surgeons 87 (70%) recommend formal additional training through preceptorship, only 25% of these surgeons have undergone this additional training. Yet, these same surgeons were attempting to receive this training, as evidenced by the large numbers of additional training experiences in which the respondents participated. Perhaps the reason that so few participated in preceptorships is related to the very limited ability of surgeons to find formal postresidency education preceptorships. Furthermore, 84% of these same respondents thought that surgeons should be required to demonstrate cognitive knowledge, and 86% thought that surgeons should be required to demonstrate laparoscopic skills acquisition before performing LGB. Perhaps this is why the highest number of surgeons taking preceptorships and other additional training involved those who already were performing bariatric surgery (Figs. 2 and 4). These surgeons already appreciated the highly complex nature of the operations and recognized the need for prolonged hands-on training. Yet, with the current system, there are no standards for postresidency skill acquisition.

On the basis of Posner's three-stage model for skills acquisition [7], we propose a structured teaching algorithm to set the standard for what is considered ade-

Table 3. Algorithm for post-residency training



quate training for credentialing in laparoscopic bariatric surgery (Table 3). Initially, surgeons should develop basic fundamental laparoscopic skills through operative experience and use of the laparoscopic skills trainer during their residency, as proposed by Rosser et al. [16]. This should effectively develop standardized skill acquisition, which reliably augments laparoscopic performance. The surgeons then enter the *cognitive* phase, in which basic laparoscopic bariatric principles are introduced through participation in one or more laparoscopic bariatric workshops. The *associative* phase is composed of a limited 6-week preceptorship, in which the surgeon works one-on-one with an expert surgeon, practicing techniques and eliminating errors. Finally, the *autonomous* phase of learning is established, in which the surgeon is assisted for a limited number of cases, perhaps five [25], using telementoring technology [18] to address the logistical concerns. The technique described in this report has been proved successful at the University of Pittsburgh Medical Center.

The results of this survey must be interpreted in the light of several inherent survey limitations. The potential for nonresponse bias must be considered with an overall response rate of only 41%. It is conceivable that nonresponders differed significantly from the questionnaire respondents in terms of their training and adoption of LGB. Additionally, because the questionnaire intentionally did not solicit respondents' complication data, accurate conclusions as to why a higher percentage of attendees are not currently performing LGB could not be determined. We thought that questions pertaining to complication rates could further reduce the number of responses. In addition, the responses received represent respondents' self-reported data. Thus, corroboration of their individual data sets regarding operative times and case logs was not possible. Therefore, any conclusions that bariatric surgical workshops improve the safety of bariatric surgery are unfounded.

In conclusion, this study demonstrated that bariatric workshops are an effective means for attendees to learn basic principle of bariatric surgery. Bariatric surgeons realize this more than any other group. Yet, these workshops in and of themselves are not adequate training for the independent performance of these surgical

procedures, which is probably why surgeons attend so many other training venues to obtain a valid education before beginning a laparoscopic bariatric program.

Finally, we propose a mechanism for any new skill acquisition in postresidency training that will allow new procedures to be performed safely. This will require the confluence of industry, employers, societies, and surgeons for its effective implementation. This is urgently needed for procedures on the advanced surgical horizon.

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