

Special Topic

Initial Results From an Online Breast Augmentation Survey

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Background: Data have been lacking to answer many questions raised in the clinical literature and by the US Food and Drug Administration with regard to patient satisfaction with breast implants, informed consent, the impact of augmentation on quality of life, repeat operations, and other issues related to breast augmentation.

Objective: The authors conducted an online survey of women with and without breast implants to collect data on key issues related to breast augmentation.

Methods: A survey including 177 questions was posted on the Web site www.implantinfo.com for 6 months, from August 2001 to February 2002. The survey was aimed at women who had undergone augmentation and those who were considering augmentation but had not yet undergone surgery. The raw data were analyzed by Data Harbor (Chicago, IL), an independent data management and technology development company with experience in managing large, complex medical databases.

Results: The survey was completed by 4011 women, including 2273 who had received breast implants and 1738 who were considering augmentation. Among the key findings: More than half of the women who had undergone breast augmentation and those who were considering the procedure thought about the decision for at least 3 years before proceeding. Most women who underwent breast augmentation (88%) were satisfied with the results, and 93% said they would recommend the procedure to friends or family members. Nearly all women who received implants thought the surgery improved their overall appearance (92%) and self-confidence (82%) but said it did not result in significant changes in their marriage/dating activities, careers, or social lives. At least 92% said their surgeons had answered their questions and listened to their concerns, and more than 75% said they remembered being informed of the risks of surgery. The percentage of women with breast pain was greater among women with implants than among those without. However, other physical symptoms, such as those associated with rheumatologic diseases, were more common among women considering augmentation. Respondents with implants did not smoke at levels higher than comparable women in the general population and were not major consumers of alcohol.

Conclusions: The Online Breast Augmentation Survey provides a wealth of previously unavailable data on women who have undergone or who are considering breast augmentation. The data indicate that women consider breast augmentation carefully, that they are well informed by their physicians before surgery, and that they are generally happy with the results. (Aesthetic Surg J 2004;24:117-135)

In 2001, the Aesthetic Surgery Education and Research Foundation (ASERF) funded a large Internet survey of women who either had undergone breast augmentation or were considering the procedure. The purpose of this Online Breast

Augmentation Survey (OBAS) was to collect data from a large, geographically diverse, and anonymous group of women in an attempt to answer questions raised by the US Food and Drug Administration's General and Plastic Surgery Devices Panel of the Medical Devices

Advisory Committee, the medical literature, and plastic surgeons and their patients.

We developed a 177-question survey for breast augmentation patients and posted it on the www.implantinfo.com Web site as a way to gather scientifically valid data from a large group of anonymous respondents. The Figure provides an outline of the survey. The OBAS was posted for 6 months.

Respondents were asked about a variety of implant- and lifestyle-related issues. In addition to demographic questions, the survey collected data on satisfaction with different body areas before and after surgery, what motivated these women to want breast implants, whether the surgery met their goals, the impact of augmentation on quality of life, the frequency of breast pain before and after surgery, reasons for reoperations, and physical symptoms (unrelated to the breast) and rheumatologic diseases before and after augmentation. Other questions of interest included how long women had considered getting breast implants before undergoing surgery, what they thought about their decision in retrospect, whether they had been influenced by others to get implants, and how well informed they were about potential implant complications before surgery. Among the group characteristics investigated were patterns of smoking and alcohol consumption, the number of children the respondents had and whether they had nursed them, where they lived, and level of education. Survey responses provided a wealth of data, part of which is reported here. Additional analysis will follow.

Methods

In 2000, we began compiling a list of questions that had been raised in the breast implant literature but not adequately answered. Several months were required to hone this list into a questionnaire composed primarily of yes/no and multiple-choice questions with a few open-ended comments. This modification was necessary once it became clear that the Internet was the ideal forum for distributing the questionnaire to the widest audience. Respondents could answer the questions online anonymously by clicking in check boxes or by making a selection from a drop-down list. The format offered the advantage of eliciting honest responses because there was no possibility that any respondent could be identified by anyone, including her surgeon.

The survey was designed to focus on women who had already undergone augmentation but also to include members of what may be considered 2 control groups

with respect to many of the variables. The major control group consisted of women who were considering augmentation (and visiting Web sites to collect information) but had not yet undergone surgery ($n = 1738$). The other control group comprised the women who had undergone augmentation themselves ($n = 2273$), who were asked many questions at the time of the survey (postoperatively) about their experiences before augmentation.

The draft questionnaire underwent multiple revisions to address issues related to online surveying. We received invaluable assistance from the Web designers and others associated with www.implantinfo.com, which is visited annually by thousands of women in search of the latest information about breast augmentation from an independent source. Visitors to the site include women who have already undergone breast augmentation and women who are trying to determine whether augmentation is right for them. These were our target audiences because we wanted women from both groups to answer many of the same questions. We were also assisted by data analysts at the International Epidemiology Institute (Rockville, MD), who have extensive experience in surveying large populations. The final questionnaire and the programming behind it were generated with Survey Solutions software (Perseus Development Corp., Braintree, MA).

For women with breast implants, the final version of the survey consisted of 177 questions, many of which comprised multiple parts. Women who had not yet undergone breast augmentation were asked 76 questions. Because of the length of the survey, we were concerned that women would not take the time to complete the entire questionnaire. It was therefore designed so that questions of greatest interest appeared early in the survey. In addition, numerous links were available throughout the survey so respondents could skip a section and proceed to the next. In some instances, this was done so that a respondent could bypass questions that did not relate to her. For example, women who did not yet have breast implants were instructed to skip all the implant-related questions and go directly to the section on breast pain. This mechanism was also designed to accommodate women who were interested in answering questions about their implants but didn't want to take the time to deal with issues they might view as irrelevant, such as those related to mammography, family history of breast cancer, breastfeeding, and physical symptoms.

One lengthy section of the OBAS (questions 112–152) was dedicated to collecting information on reoperations

Age, height, weight, bra size (before and after augmentation)
 Satisfaction with current appearance of breasts and other body areas
 Reasons or goals for getting breast implants
 Influences for getting breast implants
 Breast augmentation experience (type of implants, previous implants, communications with surgeon, naturalness of breast feel, potential complications)
 Quality-of-life changes
 Satisfaction with decision to get implants
 Breast pain (before and after augmentation)
 Mammography history
 Pregnancy and nursing
 Family history of breast cancer
 Demographic information (state and type of area lived in, marital status, highest level of schooling, average annual household income)
 Revision surgery (for ≤ 4 revisions): type of implants before and after revision, implant replacement, condition of implants, other procedures done, reason(s) for revision
 Implant details*
 Smoking history and alcohol consumption*
 Physical symptoms (> 2 months)*
 Rheumatologic-disease diagnoses and physical symptoms*

*The last 4 sections were posted a few weeks after the preceding sections.

Figure. Outline of the Online Breast Augmentation Survey.

among survey respondents who had already undergone augmentation. This section contained a series of 10 questions that were repeated for up to 4 revision surgeries. If a respondent had undergone 4 revisions, she was instructed to proceed through all 4 series, each comprising 10 questions, related to reoperations. The questionnaire was designed so that women who had not undergone a revision surgery could immediately jump to question 153 and bypass the section on reoperations.

When it became clear after a few weeks that response to the survey was far greater than anticipated, we took the opportunity to post additional questions (indicated in the Figure). Fearing that survey respondents would be overwhelmed by the original 152 questions and therefore decline to participate, we initially omitted some important topics. With the help of www.implantinfo.com, we included the additional sections in the survey within the first 6 weeks. The entire revised survey was submitted by 1500 (of a total of 2273) respondents with implants and by 1488 (of 1738) respondents without implants.

The survey was posted on www.implantinfo.com for 6

months, between August 2001 and February 2002. A computer server automatically stored and tabulated questionnaire responses as soon as a survey was submitted. The software eliminated any possibility that data could be changed or manipulated after being submitted by a respondent.

The possibility that a single person would submit multiple questionnaires was a serious concern. Although mechanisms were programmed into the survey to reduce this possibility, they were not completely effective. When communicating with a Web site, a computer automatically transmits an identifying internet service provider (ISP) number specific to that computer. If more than 1 survey was received from a specific computer, any submission after the first submission was supposed to be rejected by the server. Although multiple responses could be submitted by an individual with access to different ISPs and computers, the subject matter of the survey and the time required for completion made this possibility seem unlikely.

Ultimately it became necessary to manually search for and delete duplicate survey submissions whenever they

Table 1. Demographic characteristics of survey respondents

	With implants	Without implants
Mean age (yr)	33.5	29.9
Area of residence (%)		
Major urban area	15	13
Major city in my state	27	25
Medium-size city	25	24
Town	20	23
Rural area	14	14
Marital status (%)		
Married	64	57
Member of unmarried couple	10	13
Single	15	19
Divorced	9	8
Separated	2	2
Widowed	< 0.4	< 0.3
Highest level of schooling (%)		
Graduate/professional degree	11	8
Some graduate school	5	3
Bachelor's degree	26	25
Some college	40	44
High school	17	18
Junior high	0.6	1
Average annual household income (%)		
\$100,000 or more	27	17
\$75,000-\$99,999	19	14
\$50,000-\$74,999	28	28
\$25,000-\$49,999	21	31
Less than \$25,000	4	10

could be identified; approximately 500 surveys were found to be duplicates. The search for duplicates was labor intensive but relatively simple. Almost all respondents supplied date of birth and e-mail address. If identical birth dates, e-mail addresses, and responses to questions were found (or a combination of 2 of these criteria, if all 3 were not available), we believed with a reasonable degree of certainty that duplication was the most likely reason. Duplicates were especially easy to identify in the few open-ended response questions. Identical surveys were typically in sequential number order because the data collection software automatically assigned a number to each submission. Most duplicate submissions seemed to have resulted when a respondent clicked the "submit" button more than once. It may be that the mechanisms designed to eliminate duplicates could not respond quickly enough to identify and delete them.

When the OBAS posting time ended, the data were downloaded to a CD and sent for analysis to Data Harbor (Chicago, IL), an independent data-management and technology development company that specializes in medicine and possesses expertise in handling large, complex databases. For instance, Data Harbor manages the National Breast Implant Registry. The only contact between Data Harbor and ASERF concerned funding for the data analysis. We consulted with Data Harbor about specific database queries and the linkage of questions. Whenever possible, answers from the group with implants and the group considering augmentation (without implants) were compared. Initial data analysis was completed in September 2003 with the use of Microsoft SQL Server, (Microsoft Corp., Redmond, WA) Microsoft Excel, and SPSS (SPSS Inc., Chicago, IL).

Results

The OBAS was answered by 4011 women, 2273 of whom already had breast implants and 1738 who were considering augmentation. Among the "without implants" respondents, 56% were planning to undergo augmentation surgery within 6 months and 19% within 6 to 12 months; 25% had not decided when they would have surgery. Of the respondents with implants, 99% had had their surgeries performed by a plastic surgeon. Only 17% of the "with implants" group had undergone another type of plastic surgery besides augmentation, and only 7% of the "without implants" group had undergone a previous cosmetic procedure.

Demographic characteristics

The mean age of the respondents with implants was 33.5 years (range 15–65 years). The mean age of the respondents without implants was 29.9 years (range 12–61 years). Major demographic characteristics are shown in Table 1. For the "area of residence" variable, the definition of the options offered was left up to the respondent.

Approximately 350 respondents did not give their state of residence. However, every state was represented in the postaugmentation survey, along with Puerto Rico and the Virgin Islands. Women from all but 2 states (Montana and North Dakota) submitted preaugmentation surveys. At least 150 respondents lived in Canada and represented all but 1 province (the Northwest Territories).

The group with implants had a mean height of 65.2

Table 2. Bra size (band and cup) before and after augmentation (%)

	Women with implants		Women without implants
	Before augmentation	After augmentation	
Bra band (inches)			
< 32	1	0.3	1
32	15	7	14
34	56	48	52
36	25	36	25
38	3	7	4
> 38	0.5	2	1
Bra cup size			
AAA/AA	12	0	7
A	46	0.2	47
B	35	6	37
C	6	48	8
D	1	35	1
> D	0.2	10	0.6

inches and the nonaugmented group a mean height of 64.9 inches. The survey asked respondents to give their weight by choosing from categories of 10-pound increments (eg, 91-100 lb, 101-110 lb, \leq 190 lb, \geq 190 lb). The two groups had nearly identical percentages in each preaugmentation weight category, and weight remained essentially stable after breast augmentation.

Bra band and cup size information was requested from respondents without implants and from respondents with implants before and after breast augmentation. Again, preaugmentation data were similar for both groups (Table 2). These data indicate that breast implants are certainly efficacious. More than half of the women in both groups wore an A-cup or smaller before augmentation, and more than 90% wore a B-cup or smaller. After surgery, 93% wore a C-cup or larger.

Implant variables

Details on the types and locations of breast implants are presented in Table 3. Unfortunately, data on how long respondents had had breast implants are imprecise because of poor question design. It seemed simple to ask, "How long have you had your current breast implants?", but the survey offered a fill-in-the-blank option that could be entered as years or months (for those who had recently undergone surgery). This required the conversion of all answers expressed in years to months. We also neglected to ask how long respondents had had any kind of breast implant, not just the

Table 3. Implant variables

Variable	%
Filler material of current implants	
Saline	86
Silicone gel	12
Double lumen (gel and saline)	0.5
Other	0.4
Don't know	0.2
None (explanted)	0.7
Ever had silicone gel	14
Manufacturer of current implants	
Mentor	48
McGhan	33
Not sure	14
Other	4
Shape of current implants	
Round	85
Contoured (anatomical)	10
Not sure	5
Surface type of current implants	
Smooth	68
Textured	23
Polyurethane	< 0.4
Not sure	9
Position of current implants	
Under the muscle	81
Above the muscle	18
Not sure	1

Table 4. Evaluation of current appearance of body areas*

Area of body	% with implants	% without implants
Breasts	Mean 4.2	Mean 1.7
1	3	45
2	5	39
3	10	13
4	34	2
5	49	1
Face (features, complexion)	Mean 4.0	Mean 3.9
1	< 1	1
2	2	4
3	18	19
4	55	53
5	25	23
Mid-torso (waist, stomach)	Mean 3.5	Mean 3.3
1	5	9
2	13	13
3	28	29
4	35	31
5	19	17
Lower torso (hips, buttocks)	Mean 3.3	Mean 3.1
1	7	10
2	17	18
3	31	31
4	33	29
5	12	12
Thighs	Mean 3.2	Mean 3.1
1	8	12
2	17	20
3	32	30
4	31	26
5	12	12
Body as a whole	Mean 3.7	Mean 3.2
1	< 1	2
2	4	12
3	28	47
4	55	34
5	12	4
Height/weight ratio	Mean 3.8	Mean 3.6
1	3	4
2	9	13
3	21	26
4	40	32
5	27	25

*1 = very dissatisfied, 5 = very satisfied.

Table 5. Goals of breast augmentation rated by women with and without implants

	With implants mean	Without implants mean
Look better without clothes	4.5	4.6
Feel better about myself	4.3	4.4
Look better in clothes	4.3	4.1
Have larger breasts	4.3	4.0
Feel more confident	4.2	4.3
Appear more feminine	4.1	4.0
Be less self-conscious	4.1	4.2
Have cleavage	3.8	3.8
Correct sagging	2.6	2.8
Regain breast size/shape before or during pregnancy	2.6	2.9
Please husband or significant other	2.3	2.4
Compensate for weight change	1.9	2.1

ones they had at the time of the survey. Such a question would have provided a specific answer for those who had implants replaced at some point.

The implantation times presented below include respondents' direct answers for those who had not undergone reoperations or the number of months since a respondent's first revision surgery. The amount of time women had implants before their first revision surgeries is unknown. However, we believe the implantation time for silicone gel implants (current and past) must be substantially longer than these data indicate. When the survey was posted in 2001 and early 2002, silicone gel implants were available only for revision of selected augmentation patients enrolled in clinical trials. Some respondents with silicone gel implants underwent an implant exchange during the month preceding survey submission. If they had had gel implants before the revision, the total duration of implantation would likely have been at least 10 years. However, in this example, the only number we can be certain of is 1 month, so that is the number used. Consequently, all data related to implantation time for revision subjects must be viewed as shorter than the actual time.

The known mean implantation time for the group as a whole is 18.5 months, with a range of 0.25 to 336 months (28 years). Fortunately, the great majority of variables we investigated are essentially unrelated to implantation time.

Table 6. Satisfaction with breast augmentation (for group as a whole, implant type, and implant exchanges)

	% of total group	Saline only n = 1876	Silicone gel only n = 223	Saline to gel n = 41	Gel to saline n = 33	Explanted n = 15
Mean implantation time (mo)	18.5	11.8	52.5	43.4	93.7	59.9
Has augmentation generally met your expectations?						
Completely	50	52	42	35	27	13
Mostly	38	37	44	50	45	40
Partly	10	10	11	15	21	13
Not at all	2	2	3	0	6	27
Are you happy with your decision to get implants?						
5 (great decision)	76	77	72	62	61	20
4	16	16	16	28	19	7
3	5	4	9	8	10	27
2	2	2	1	3	0	7
1 (horrible decision)	1	1	2	0	10	40
Mean	4.6	4.7	4.5	4.5	4.2	2.6
Would you recommend augmentation to friends or family members?						
Yes	93	95	90	90	80	40
No	7	5	10	10	20	60
Feel of your breast (left and right combined)						
5 (natural feeling)	25	22	44	60	13	13
4	34	35	27	25	28	38
3	26	27	17	10	31	19
2	11	11	6	3	25	25
1 (too hard)	5	4	7	3	3	6

Evaluation of appearance

The questionnaire asked respondents to rate their general satisfaction with the current appearance of different body areas with the use of a 5-point scale on which 1 indicated “very dissatisfied” and 5 indicated “very satisfied.” The results (Table 4) revealed a significant difference between the 2 groups with respect to satisfaction with breast appearance (implant group mean 4.2, nonimplant group mean 1.7). We expected this result because women who are happy with the appearance of their breasts would not undergo augmentation. Ratings of other body areas were mostly comparable between the 2 groups, with one exception: Women with implants were more satisfied with the appearance of their “body as a whole,” with a mean of 3.7 compared with 3.2 for women without implants. This may reflect improved proportionality (balance between breasts and hips) after augmentation.

Respondents also rated breast appearance more specifically. The same results were found when women with and without implants were asked about “breast appearance in clothes” (implant group mean 4.4, nonim-

plant group mean 2.3). For “breast appearance in a swimsuit,” the mean ratings were 4.4 and 1.7, respectively. For breast appearance in the nude,” the means were 4.1 and 1.7, respectively. In response to the question “Do you receive more compliments on your appearance since breast augmentation?,” 69% answered yes.

Goals of and satisfaction with breast augmentation

In the survey we asked women to indicate their reasons for getting breast implants by choosing a number on a 5-point scale, with 1 indicating “not important” and 5 indicating “very important.” More than 1 “very important” reason was allowed. The mean ratings for these reasons, or goals, are shown in Table 5. Respondents with implants were then asked, “For those reasons scored as 4 or 5, has breast augmentation generally met your expectations?” For the group as a whole, those responding “completely” or “mostly” totaled 88%.

Table 5 breaks down the satisfaction-related data according to implant filler type and revision operations that involved switching from 1 type of filler to another or

Table 7. Impact of implants on quality of life (%)

Parameter	Better	Same	Worse
Marriage/dating	31	66	3
Sex life	53	44	3
Work/career	14	85	1
Social life	25	74	1
Life in general	44	54	2
Self-confidence	82	15	3
Wardrobe options	83	10	6
Overall appearance	92	6	2

Table 8. Length of time respondents considered breast augmentation (%)

	Women with implants: How long did you think about getting implants before having surgery?	Women without implants: How long have you been considering breast augmentation?
3 mo or less	8	4
4-6 mo	11	8
7-11 mo	13	13
1-2 yr	14	18
3-4 yr	12	25
5-7 yr	15	14
8-10 yr	15	3
11-15 yr	7	11
> 15 yr	5	3
Mean	62 mo	51 mo

to explantation without replacement. The “total group” column includes double lumen implants, as well as responses of “other” and “don’t know.” Reoperations that did not involve a filler-material change are included in the “saline-only” and “silicone gel only” columns. The “saline-to-gel,” “gel-to-saline,” and “explanted” subgroups were quite small but are interesting. For example, women who changed from saline to silicone gel seemed to be generally more satisfied than those who switched from silicone gel to saline. We cannot know whether this is related to the implant filler or to the differing implantation times.

Women who currently have saline implants were significantly more likely to say that augmentation “completely” met their expectations than were women who currently have silicone gel implants ($P < 0.0015$, Fisher’s exact test).

Table 9. Preoperative discussions related to implant risks (%)

Did your surgeon talk with you about the risk of	Yes	No	Don’t remember
Implant rupture or deflation	90	6	3
Changes in breast sensation	90	7	3
Infection	88	9	3
Breast hardness	82	12	6
Breast pain	83	12	5
Additional implant surgery	78	17	5
Bleeding	78	14	8
Less clear mammograms	73	18	8

Significance disappears when “completely” and “mostly” responses are grouped together (88% with saline, 85% with silicone gel).

Table 6 also presents responses to questions related to satisfaction with breast augmentation. Respondents were asked to use a 5-point rating scale on which 1 indicated “horrible decision” and 5 indicated “great decision” to judge whether they were happy about the decision to get breast implants. Ninety-two percent of all respondents rated their decision as a 4 or 5. Women who currently have saline implants were significantly more likely to feel that their decision was “great” ($P = 0.0136$, Fisher’s exact test). Of the group as a whole, 93% said they would recommend breast augmentation to friends or family members. Again, there was a significant difference ($P = 0.01$, Fisher’s exact test) in this variable between the women who currently have saline and silicone gel implants.

Because the feel of the breast can influence a patient’s satisfaction with her implants, respondents were asked to rate the feel of each breast on a 5-point scale, with 1 signifying “too hard” and 5 signifying “natural-feeling.” The mean rating for the right and left breasts together was 3.9. Ratings for the right and left breasts combined were 3.60 for current saline and 4.02 for current silicone gel implants ($P < 0.0001$, Fisher’s exact test).

Life changes after augmentation

Women with implants were asked whether internal and external factors that can affect quality of life had changed since they had undergone breast augmentation (Table 7). These respondents were given 3 options for each area: “better,” “same,” and “worse.” These questions were not intended to quantify these variables but to

Table 10. Breast pain before and after augmentation % for women who reported breast pain

Parameters	Women with implants		Women without implants
	Before augmentation	After augmentation	
Yes, I have breast pain	40	51	32
Pain is associated with*			
Nursing	27	1	26
Menstrual cycle	80	45	85
Caffeine	13	7	16
Eating chocolate	3	2	3
Cysts	13	7	12
Breast implants		42	
Implants only reason cited		31	
No reason selected	9	3	3
None of the above	25	23	4
Where do you typically have breast pain?			
Both breasts	89	69	85
Right breast only	6	17	7
Left breast only	6	14	8
How many days a month do you have breast pain (average)?			
1-2	53	34	52
3-5	37	29	34
6-10	7	13	10
11-20	1	6	2
Most days	1	18	2
Has breast pain severity changed since you got implants?			
About the same		48	
More severe		35	
Less severe		18	
Has breast pain frequency changed since you got implants?			
About the same		44	
More frequent		41	
Less frequent		15	

*Multiple reasons could be checked.

get a sense of whether augmentation had had an impact on aspects of respondents' everyday lives.

Very few respondents reported a negative effect of breast augmentation. Most indicated that 4 of the 8 factors listed (marriage/dating, work/career, social life, life in general) were the same. These variables are most relevant to real life, and augmentation does not change them for most women. The other 4 items were rated as better by most respondents (overall appearance, 92%; wardrobe options, 83%; self-confidence, 82%; sex life, 53%).

Time spent considering augmentation

One question of interest to us was how long women consider breast augmentation before deciding to proceed with surgery. The answers (Table 8) indicate that neither group can be considered impulsive, with 68% of women who had undergone augmentation considering the procedure for at least a year and more than half (54%) waiting at least 3 years. Some said they had considered augmentation for as long as 30 years before having surgery. The women without implants were even more

cautious, with 74% having thought about augmentation for at least 1 year.

Discussions about implant risks (informed consent)

In the survey we asked about several aspects of informed consent to learn whether women had been (or remembered being) informed about possible implant-related complications (Table 9). At least 78% of women said they had been informed of the risks listed in the survey, with the exception of “less clear mammograms,” which was recalled by 73%.

Other questions about communication between the women and their surgeons received overwhelmingly positive responses: When asked, “Did your surgeon prepare you for what to expect after augmentation surgery?” 91% said yes; when asked, “Did your surgeon take time to answer your questions?” 96% said yes; and when asked, “Did your surgeon take time to listen to and understand your concerns?” 92% said yes.

Choice of implant size

Because a desire for change in implant size is a major reason for revision surgery, we asked women how the size of their implants was chosen. Most respondents said they played an active role in selecting implant size. Options in the survey question and percentage of responses were: “My surgeon and I decided together” (62%), “I told my surgeon what bra size I wanted to be” (47%), “I showed my surgeon photographs from a magazine or Web site” (37%), “I experimented with padded bras or bra fillers” (33%), “My breast width was measured” (19%), and “My surgeon chose the size” (18%). The data have not yet been analyzed to compare these responses to those who cited “change in size” as a reason for eventual implant exchange.

Breast pain before and after augmentation

We questioned women with and without implants about the presence, frequency, and severity of breast pain, as well as its possible associations. In addition, women with implants were asked about breast pain before and after augmentation. Table 10 shows that breast pain was more common in women with implants than in those without implants. There was a significant difference between women without implants and women with implants before augmentation ($P < 0.0001$) and between women with implants before and after augmentation ($P < 0.0001$). We cannot explain why the respondents with

implants had significantly more breast pain before augmentation than the women who have not yet undergone surgery. Our assumption was that these 2 groups would be comparable with respect to this variable. Among women who underwent augmentation, the frequency and location of breast pain before surgery were generally similar to those experienced by women without implants. In contrast, 42% of postaugmentation respondents associated their breast pain with their implants, said they have more unilateral pain, and said that it is present for more days of each month. Because approximately a quarter of the group with implants associated their breast pain with “none of the above,” the meaning of some of the data is difficult to grasp. When breast pain and implant type were compared, we detected no statistically significant difference between women with silicone gel implants and those with saline implants with regard to frequency ($P = 0.22$) or severity ($P = 0.21$) of breast pain.

Another question not presented in Table 10 asked survey respondents to choose the number, on a scale of 1 to 10, that best matched the severity of their typical breast pain, with 1 representing “least I ever had” and 10 representing “worst I ever had.” For all 3 groups, the combined left and right breast pain severity ratings had identical means of 3.9.

Bra-cup size was used as an imprecise surrogate for implant volume to compare breast pain severity and frequency with cup size in women who had undergone augmentation. An unexpected correlation was found: Respondents with a postoperative cup size of C or less were more likely to experience increased pain severity and pain frequency after implantation compared with women who had a postoperative cup size of D or larger (more severe: 30.5% vs 23.4%; more frequent: 34.6% vs 29.9%).

Children, nursing and breast implants

Because the medical literature lacks information on whether breast implants really do interfere with breastfeeding, we used the OBAS to collect data on this question. Women with and without breast implants were similar in all comparable measures. For example, 64% of women with implants had children, as did 66% of women without implants. Among the 1425 women who had undergone augmentation, 96 reported giving birth (to a total of 142 children) after augmentation; 69 of those 96 women breastfed. Nursing time and reported problems were generally similar to those reported by women without implants and to those reported by women who breastfed before augmen-

Table 11. Breastfeeding before and after augmentation (percentages for women who had children)

	Women with implants		Women without implants
	Before augmentation	After augmentation	
How many children have you given birth to?			
0	3	93	
1	24	4	26
2	44	2	46
3	20	1	20
4	7	0	5
5 or more	3	0	2
How many children did you breastfeed?			
0	22	95	
1	26	3	34
2	32	1	43
3	14	0.4	17
4	4	0.01	4
5 or more	1	0	1
If you nursed any children, how long did you nurse them?			
1-4 weeks	16	22	15
2-3 months	19	18	21
4-5 months	12	13	12
6-8 months	18	15	19
9-12 months	34	32	33
Did you have any problems while nursing? (check all that apply)			
Insufficient milk production	21	28	20
Breast infection	16	11	14
Nipple sensitivity	25	21	23
"Fussy" baby	17	16	18
Schedule conflicts	9	3	7
Difficulty finding privacy	7	4	7
Didn't have any problems	46	51	48
Afraid to nurse with implants		1	

tation (Table 11). In fact, 51% of the 69 women said they had no problems nursing, compared with 46% of the same women before they underwent implantation. Only 1 respondent was afraid to breastfeed because she had implants. Insufficient milk production was a more frequent problem among women who underwent augmentation, reported by 28% of those who nursed compared with 21% of the same women who breastfed before augmentation. At the same time, breast infection was less common after augmentation. Fifty-six survey respondents had children both before and after getting implants, but their data have not yet been analyzed.

Although we now have data on breastfeeding, the issue of nursing and augmentation does not have a major impact on patients. According to the survey, 93% of respondents seem to be finished having children before they pursue breast augmentation, and 95% of postaugmentation patients did not breastfeed.

Mammography before and after augmentation

With respect to mammography, 44% of respondents with implants and 25% without implants had ever undergone mammography. These figures are best explained by the mean age of the women, which is several years

Table 12. Smoking and alcohol consumption of survey respondents

	% With implants	% Without implants
Smoking history		
Never smoked	52	50
Former smoker	27	25
Current smoker	21	25
If you currently smoke, how much do you smoke?		
Less than a pack a day	65	73
1-2 packs a day	35	27
More than 2 packs a day	0	0
Which statement best describes your typical pattern of alcohol consumption?		
I never drink alcohol	11	11
I rarely drink alcohol (once a month or less)	34	40
I have a few drinks a month	32	31
I have a few drinks a week	19	16
I have at least one drink most days	5	3

Table 13. Percentage of survey respondents with diagnosed diseases

Diagnosed disease	Women with implants		Women without implants
	Before augmentation	After augmentation*	
Rheumatoid arthritis	1.3	0.3	1.5
Osteoarthritis	2.4	1.9	2.9
Lupus erythematosus	0.5	0.1	0.3
Scleroderma	0.07	0.1	0
Sjögren's syndrome	0.07	0.07	0.1
Fibromyalgia	1.7	0.6	2.3
Other diseases not listed	6.3	1.3	6.5

*Shows respondents who said they were diagnosed after augmentation. Rheumatoid arthritis, 4; osteoarthritis, 15; lupus erythematosus, 2; scleroderma, 2; Sjögren's syndrome, 1; fibromyalgia, 9; other disease, 18.

younger than the recommended initial-mammography age of 40. In open-ended remarks, many women between the ages of 20 and 39 mentioned that they were required to undergo mammography before getting implants. When asked whether they followed their doctors' recommendations for mammography, 84% of the implant group and 83% of women without implants answered yes. Women who had undergone breast augmentation were asked whether they told the examiner they had implants: Of these respondents, 83% had not had a mammogram with implants; 16% said they alerted the examiner to the presence of implants, and 1% said they did not.

One reason we included questions about mammography in the survey was to determine whether women were

worried about the possibility of implant rupture during the examination. This was cited by 9% of women with implants as a reason for their not getting regular mammograms. The other reasons given were "not old enough" (83%), "fear of discomfort" (5%), "didn't know I needed to" (5%), "couldn't find time" (3%), "fear of radiation" (2%), "difficulty getting to a mammography facility" (1%), "fear of finding out I might have cancer" (2%), and "other" (7%).

The women were also asked whether a close blood relative had had breast cancer; this was the case for 20% of the implant group and 22% of the group without implants. Ten women in the augmentation group had breast cancer (8 learned of the diagnosis before implanta-

Table 14. Percentage of survey respondents reporting physical symptoms

Symptom	Before augmentation	After augmentation	Women without implants
Joint pain	13	6	19
Joint swelling	4	2	8
Muscle aches or pains	17	10	28
Muscle weakness	4	5	8
Numbness or tingling in arms/legs	9	9	18
Abnormal fatigue	8	7	18
Difficulty sleeping	14	12	27
Dry eyes	10	5	16
Dry mouth	4	3	10

tion, 2 after). Four respondents without implants said they had had breast cancer.

Smoking and alcohol consumption

Because the issue of smoking and drinking among breast augmentation patients has been raised in the literature, we used the survey to collect data on these questions. The percentage of respondents with (21%) and without (25%) implants who said they smoked at the time of the survey seems equivalent to — or perhaps lower than — smoking rates in the general population (Table 12). According to the Centers for Disease Control and Prevention, the national figure for white women 18 and older who smoke is 24%. In addition, the women surveyed are not major consumers of alcohol.

Diagnosed diseases and physical symptoms

The OBAS provided an opportunity to ask a random group of women with implants about their history of rheumatologic diseases, which some have suggested are associated with breast augmentation. Table 13 shows that women with and without breast implants reported similarly low frequencies of these diseases. We cannot verify the accuracy of these self-reports, but some who learned they had such diseases before getting implants said they consulted with their physicians and discussed the risks before surgery. The number of newly diagnosed cases after augmentation was low. An open-ended comment option allowed women who said they received the diagnosis of a chronic illness other than those listed in the survey to enter these diagnoses. For the women with implants, the most-often cited disease was hypothyroidism ($n = 11$), followed by Graves' disease (6), inflammatory bowel disease (6), multiple

sclerosis (4, all cases diagnosed before augmentation), chronic fatigue syndrome (2), non-Hodgkin's lymphoma (2), and Lyme disease (2).

The OBAS also asked about non-breast-related physical symptoms anecdotally linked to breast implants. Because almost every woman experiences these symptoms at some point in her lifetime, we asked respondents to answer yes only if they had experienced a symptom for at least 2 months in an attempt to separate chronic symptoms from transitory ones. As indicated in Table 14, respondents were slightly less symptomatic for most items after getting breast implants. Only 1 symptom, "muscle weakness," had a higher postaugmentation percentage, by 1%. One of the more surprising findings is that the group without implants reported higher frequencies of all symptoms, often twice as high.

A respondent who answered yes to any of the listed symptoms could use an open-ended-answer option to explain whether she associated her symptoms with any particular cause. The most common responses involved injuries sustained in accidents or while being too aggressive in sports or exercise programs, job stress, lack of sleep (often because of children), and perimenopausal changes.

Frequency of and reasons for revision surgery

Among survey respondents, 292 — 13.2% of the group with implants — reported having at least 1 revision surgery between 1973 and 2002. The numbers declined for each successive revision, and less than 3% of the group as a whole had undergone more than 1 revision. For example, 62 women had 2 revisions, 13 had 3, 8 had 4, and 1 had 5.

Table 15 shows the reasons for the first revision,

Table 15. Reasons for first reoperation (n=292)

Reason	%
Revision of implant pocket to improve breast shape/position	38
Wanted larger size implants	34
Capsular contracture (breasts too hard/round)	28
Breast size or shape not symmetrical (in absence of rupture or deflation)	18
Known or suspected rupture or deflation	15
Breast felt abnormal to touch because of implant	14
Other	13
Skin overlying implant wrinkled or rippled	12
Breast pain/burning	10
Concern about safety of silicone	7
Concern about rupture because implants were old	6
Wanted to move implants from above to beneath pectoralis muscle	3
Wanted smaller size implants	3
Cosmetic revision of scar	3
Physical symptoms other than breast pain	1
Infection around implant	1
Implant had extruded through skin	1
Improve accuracy of mammograms	1

whereas [Table 16](#) gives details of the first revisions. We developed this list to reflect our personal experience and reasons cited in the literature. Respondents were asked to check all reasons that applied to them. There was no opportunity for respondents to specify reasons other than those listed, so these reasons are unknowable. We also do not know whether some women had more than 1 revision for the same reason, but future analyses should provide answers.

Discussion

Survey design lessons and possible data biases

The data analysis process revealed some flaws in the survey design. For example, data would have required less “cleaning” if more drop-down lists had been used instead of fill-in blanks. A question that required a year answer should have offered a list of years (or year ranges) to select from rather than a blank that required typing, which could be entered inconsistently (eg, “1995” and “95”). Although we thought the survey instructions were clear, a small percentage of women without implants responded to questions intended for those with implants. Their answers were ignored.

Another problem arose because we had no way to ensure that every participant answered every applicable

question, and some questions in a topic section were bypassed whereas others in the same section were answered. In the mammogram section, for instance, question 86 asked, “Have you ever had a mammogram?” On question 87 (“How many mammograms have you had?”), the number of responses was higher. Apparently some respondents skipped yes/no question 86 but made the effort to type in how many mammograms they had in response to question 87.

Perhaps such errors are unavoidable in a large online survey, which provides no opportunity to ask an individual what she means. The mistakes that appeared in both the survey design and the responses did not have an impact on the results because the study group was so large.

Possible study biases include the fact that all survey respondents were self-selected. They had to first visit the www.implantinfo.com Web site and then decide to complete the questionnaire. Some may view this Web site as “pro-implant,” and women unhappy with their augmentation experience might not linger there, although dissatisfied women clearly submitted the survey — sometimes more than once. In reality, www.implantinfo.com has no evident agenda and offers objective, wide-ranging information.

As is the case with so many augmentation studies, our design probably did not include ideal controls. To

Table 16. Details of first reoperation (%)

Which breast was operated on?	
Both	76
Left	9
Right	16
Which type of implants did you have before reoperation?	
Saline	69
Silicone gel	27
Double lumen (gel and saline)	2
Other	2
Don't know	0.3
Which type of implants did you have after reoperation?	
Saline	67
Silicone gel	27
Implants were not replaced	4
Double lumen	1
Other	1
Did you have an implant removed during this reoperation?	
Yes	73
No	27
If you had an implant removed, what other procedure was done?	
Implant replaced with new implant	63
Old implant reused	28
None; implant removal only (no replacement)	3
Mastopexy (breast lift) plus implant	4
Mastopexy without implant	2
Did your revision surgery successfully address your reason for reoperation?	
Completely	30
Mostly	30
Partly	14
No	12
Successful to date	9
Only temporary success	5

our knowledge, the perfect control group for patients with implants has yet to be defined, though it does not seem to be breast reduction patients or other cosmetic surgery patients. We knew that actual control groups would not be available but believe the study employed an approach that is both useful and unique: surveying large and anonymous groups of women considering augmentation (without implants) and women with implants who were asked about variables before and after implantation.

Demographic characteristics

The number of respondents from each state generally reflected the US population distribution. Because survey

participation was available to everyone nationally who visited the www.implantinfo.com Web site and because the response was so large, regional biases were minimized.

Most respondents with implants (74%) were married or a member of an unmarried couple. Slightly fewer (70%) of those without implants were in a long-term relationship. The percentage of divorced respondents was comparable in both groups to the figure of 10% among women ages 18 to 64 in the general US population.

Both groups of women were well educated: 42% of women with implants had a college degree or more education, compared with 36% of women without implants. More than 80% of each group had had at least some col-

lege education. These levels of education seem to be reflected in the average annual household income, which was higher than the national average for both groups. Nearly 75% of postaugmentation respondents earned \$50,000 or more, compared with 59% of women without implants.

The results for education level and income cannot be assumed to reflect these variables for all women with implants. The one thing needed to participate in the survey was access to the Internet, which is not available to everyone. However, about 70% of US households that include children and married women earning \$50,000 or more are connected to the World Wide Web. Internet access is available to even more people through their jobs. The survey therefore had the potential to reach the target audience of augmentation patients.

The body-mass index (BMI) of the participants has not yet been calculated, but estimated BMIs should be available in the height-and-weight data. We suspect that both groups' BMIs were lower than the national average. Fewer than 1% of all respondents reported a bra-band size larger than 38, which is an indication these women were probably thinner than the national average. In addition, 81% of women with implants and 80% of women without weighed less than 141 lb.

Body image among women with implants

The OBAS used a 5-point Likert scale as a simple way of eliciting information about body image and comparing the group who had undergone augmentation with the group that had not. With the exception of breast appearance among women without implants, the respondents as a whole rated themselves at 3 or higher on the questions related to body image. Among the women with implants, the percentages of those who were very dissatisfied with any body area were in the single digits. In fact, the highest percentage of "very dissatisfied" ratings in the implant group was 8% for the variable of thighs, the variable that also elicited the highest percentage of dissatisfaction among women without implants (12%).

These data suggest the respondents had a generally positive body image and that they were not distressed by their appearance as a whole. Before augmentation, dissatisfaction was associated with the breasts only. After augmentation, the women were more satisfied with their breasts than any other body area, with 83% giving their breasts a rating of 4 or 5 and 92% rating this area 3 or higher. The idea that women who choose augmentation

are generally happy with their bodies is reinforced by the fact that only 16% have had cosmetic surgery other than breast augmentation.

We cannot explain why some women who seem to have statistically "normal" bodies feel self-conscious, uncomfortable, or insecure because of their breast size. This is more understandable for women who wear a cup size of A, AA, or smaller. Why women with a B-cup or larger feel distress about breast size is beyond the scope of our survey. For those women who are generally satisfied with their body appearance but are distressed or embarrassed about breast size only (as the survey data suggest), breast augmentation is a reasonable solution to a perceived problem.

Factors contributing to satisfaction with breast augmentation

The survey data indicate that women who pursue breast augmentation have multiple goals, most of them related to appearance. The highest-rated reason for women with and without implants was to "look better without clothes," which is definitely an appearance-related variable. However, it may not be a totally external variable, because very few people will ever see these women nude. "Pleasing a husband or significant other" was one of the lowest-rated goals (means of 2.3 and 2.4 for the 2 groups), suggesting that the women wanted to look better for their own internal reasons.

Other reasons with a mean greater than 4 were "be less self-conscious," "feel more confident," and "feel better about myself." The last variable received the second-highest percentage of 5 (very important) ratings (59% for the implant group and 61% for women without implants). This goal was second only to "look better without clothes" (rated 5 by 67% and 72%).

Most women who responded to the survey seemed to seek breast augmentation on their own and for their own reasons. When asked whether anyone had encouraged them to pursue augmentation, only about a third of each group answered yes. (Encouragement should not be interpreted as pressure, which we did not ask about.) Among that third who said they received encouragement, more than half were encouraged by a husband or significant other (57% of augmented women and 61% of the women without implants) or a friend (55% for both groups). Approximately a quarter of each group (26% and 22%, respectively) were encouraged by a relative, 15% by a co-worker, and fewer than 10% by others.

Respondents with implants were also asked whether they had received criticism for getting implants, and 36% said they had. This criticism did not seem to undermine satisfaction levels. When women with implants were asked to consider the goals they scored as 4 or 5 and then record whether their expectations were met, only 2% answered “not at all,” 10% said “partly,” 38% responded “mostly,” and 50% answered “completely.”

Another question about satisfaction was posed late in the survey, when respondents rated their happiness with the decision to get breast implants. On a 5-point scale (with 5 indicating “great decision”), 76% chose 5 and another 16% chose 4. As mentioned earlier, 93% of women with implants said they would recommend augmentation to others.

We suspect that the high levels of satisfaction are related to the often lengthy amounts of time women devote to considering augmentation before deciding to proceed with surgery. We were surprised to learn that 54% of survey respondents had considered augmentation for at least 3 years. This issue is important because some have expressed concern that women rush to have surgery too soon after their consultation and do not take time to consider the risks and ramifications. Moreover, they also do a great deal of research on breast augmentation long before making an appointment with a plastic surgeon. The Internet is a great equalizer that offers so much information — positive and negative — to prospective augmentation patients that such patients are, in our experience, among the best informed patients we have encountered.

At the same time, as shown in [Table 7](#), they also seem to be a realistic group with respect to the impact breast augmentation might have on their lives. Plastic surgeons have long cautioned patients that cosmetic surgery cannot fix relationships or problems. The survey not only supports this contention but also confirms that women understand that breast augmentation will not significantly improve most aspects of their social lives.

Informed consent

FDA advisory panels have heard criticism of plastic surgeons for failing to provide prospective augmentation patients with sufficient information about the risks of breast implants. The survey data show that nearly all respondents were quite positive about their communications with their surgeons, and most remembered being informed by their surgeons about the specific risks listed

in the survey. The survey indicated that only a small percentage of respondents could not remember being told about specific risks. There is no way to compare these memories with what the women were actually told, and some loss of information over time is expected. Ideally, discussion of all risks should have been remembered by 100% of respondents; at most, 90% of respondents recalled discussions of any specific risk.

Revision surgeries

Approximately 13% of the group with implants reported having at least 1 revision surgery. When details from the first revision were compared with details from subsequent revisions, no important differences were found. We were somewhat surprised that the percentage of women who choose not to have another implant remained in single digits across all revisions: first reoperation, 5%; second reoperation, 8%, third reoperation, 9%; fourth reoperation, 0%. One might expect that more women who have multiple revisions finally give up on implants, yet most women who have any reoperation continue to want breast implants. It seems that breast augmentation patients are willing to put themselves through multiple surgeries to keep their implants. This suggests that the implants are so important to them that the risk (and reality) of multiple operations is worth the time, pain, and expense.

The percentage of reoperations reported by this group and their reasons are generally in line with data published elsewhere. The need or demand for revision surgery remains a problem in this patient population. We will never reach a point when complications no longer occur and implants last forever. Although no revision is good, they are especially problematic when performed for a preventable reason such as implant size change. If more time is spent communicating with patients before surgery and ensuring that they play an active role in choosing implant size, the number of revisions for size change might be largely eliminated.

Another common cosmetic reason for reoperation involves asymmetry of size, position, or breast mound shape. Although this reason for revision may be patient-driven, avoidance or correction of asymmetry is complicated, often technique-dependent, and related to the skill and experience of the surgeon. Nevertheless, we believe it is possible that the number of revisions for asymmetry could be reduced if surgeons were careful to document any preexisting asymmetry and discuss it with patients.

Not all preexisting asymmetries can be corrected with augmentation. In fact, adding an implant can make preexisting asymmetry more pronounced. Women who seek breast augmentation must be made to understand these possibilities and also accept them before surgery. If patients are properly prepared, they will be more tolerant of imperfection, and the demand for revision because of a slight asymmetry can probably be reduced.

Conclusions and Future Research

The OBAS has produced data never before available to plastic surgeons, researchers, and regulatory bodies. We all owe a debt of deep gratitude to the more than 4000 women who took the time to respond to the survey. They approached this task with great seriousness. Their open-ended comments (not presented here) also revealed refreshing honesty, which may be typical of Internet-based surveys. The degree of anonymity offered on the Web should make this tool valuable for future medical data collection.

Although the questionnaire contained some flaws, the instrument worked well on the whole. Unfortunately, at the time of this writing there exists no mechanism for using the OBAS as a longitudinal tool to follow the same women over time. However, the snapshot picture that emerged has great value. It confirmed many suppositions based on clinical experience, such as why augmentation patients have revisions and whether previously reported high levels of satisfaction are accurate. We also learned that women who seek augmentation are unhappy with their breasts only, not with other body areas. In general they seem to have a healthy body image. They also possess realistic expectations and an understanding that augmentation will not produce life-changing results. At the same time, women who undergo breast augmentation report feeling better about themselves and expressed increased self-confidence.

The most important results from the OBAS are those related to questions never before asked in a systematic way or questions that have been inadequately answered. Among them is the finding that most women think about having augmentation for years — even decades — before proceeding. This suggests they do not approach the surgery impetuously but make a reasoned decision that implants are right for them. Our respondents were happy with this choice, with 92% rating their decision to get implants as “great” (76%) or “good” (16%).

The nationwide extent of the survey produced demo-

graphic data that were previously unavailable. We received responses from nearly every state and most Canadian provinces. In addition, the percentages of women who have undergone augmentation in rural areas and major metropolitan centers were nearly identical. The fact that the survey was posted online and therefore required Internet access may skew some demographic variables, but most survey respondents were well educated, and 75% earned at least \$50,000 a year. This confirms our clinical experience.

The women who were interested in getting implants but had not yet done so turned out to be very similar to the women who already had implants. The two groups were closely matched in terms of geographic distribution, number of children, education, preoperative bra-cup size, and reasons for wanting implants. However, women considering augmentation were somewhat less likely to be involved in a long-term relationship and were nearly 4 years younger than the women who had already gotten implants. This group had also spent years thinking about augmentation.

Before this survey, we had no real idea whether women who had undergone breast augmentation smoke or drink more than members of the general population. For the first time, hard data from an anonymous, large, and geographically diverse group of augmentation patients are available on these questions, and the answer is no. These findings confirm our experience: Women who get breast implants typically have healthy lifestyles because feeling fit and looking good are important to them. Smoking cigarettes and consuming large amounts of alcohol are contrary to these goals.

Much debate has surrounded the issue of diagnosed diseases and symptomatology in women with implants. The debate persists even though no pre- and postoperative symptom data have been available to resolve the question. Our results show that women who undergo augmentation are no more likely to receive a diagnosis of rheumatologic disease after receiving implants than women without implants. In addition, respondents without implants report having more physical symptoms than the women with implants. To our knowledge, the OBAS represents the first time data on symptomatology have been collected from a large group of augmented women outside a doctor's office. Studies that have addressed the prevalence of these types of symptoms in the past have focused on patient records, meaning that a potentially large percentage of the women made the effort to go to

their surgeon's office. Such a group is self-selected for physical complaints. We believe that the OBAS data are much more randomized. Furthermore, the group is much larger than any reported previously.

Future data analysis will more deeply investigate the disease and symptom data. For example, a small percentage of survey respondents had their implants removed and not replaced. Where do they fit into the postaugmentation symptom profile? It seems doubtful they account for the overall decline in symptoms. We also want to further examine the open-ended comment questions contained in the survey section on symptoms and diseases.

The OBAS produced so much data that full analysis may require years. This initial report has concentrated on presenting the "big picture" results and making them available as soon as possible. Deeper data analysis will be conducted in the future on questions suggested by these initial findings. A few of them are listed here:

- Many women reported being actively involved in the choice of the implant size. How many of these women later underwent revision to change implant size? In other words, does patient involvement in the choice of breast size reduce the need for revision?
- Among augmented women, do differences exist between those with and without breast pain with respect to implant type, implant position, number of revisions, or age?
- What percentage of women who reported physical symptoms have silicone gel implants? Saline implants?
- Did women who had more than 1 revision have the same reason(s) for subsequent revisions as for the first revision?
- How do variables such as happiness with the decision to get implants correlate with the need for revision?

These are just a few of the questions we hope the survey will help answer, and others will undoubtedly arise as we dig deeper into the data. We welcome suggestions for research ideas. ■

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