



# Plastic Surgery & Diving

## Breast Augmentation (Breast Implants)



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*In the previous issue we discussed plastic surgeries such as nose jobs, liposuction and face lifts, noting that the topic of breast augmentation was complex enough to warrant its own story in this issue.*

*And, at the risk of repeating ourselves, we do want to remind readers that though it's cosmetic rather than life-saving, plastic surgery is still surgery, and it has inherent risks. And most insurers don't cover it.*

*It's important that anyone undergoing any procedure must be realistic about what it involves, what it can accomplish and what can go wrong with it, whether it's a general concern or related to future diving.*

*Clearly there is a demand for plastic surgery. It's mostly done as a spare-time exercise. So is recreational scuba diving. To balance the need to accommodate both, the following information gives an overview of breast surgery and its impact on diving.*

*These recommendations come from two DAN referral physicians who are familiar*

*with both plastic surgery and scuba diving. Edward Golembe, M.D., is director of the Hyperbaric and Wound Healing Center at Brookdale University Hospital in Brooklyn, N.Y.*

*Dr. Ralph Potkin is medical director of the Beverly Hills Center for Hyperbaric Medicine in Los Angeles, Calif. Dr. Potkin consulted with fellow plastic surgeon Dr. Steven Zax for his answers and, as he noted, "First and foremost, these remarks are generalizations, and each case needs to be individualized and the cosmetic surgeon should be involved in the decision-making. Also, these recommendations are based on favorable, uncomplicated healing."*

*Besides the risks given for this procedure, all surgeries' potential risks include bleeding, reaction to the anesthetic and infection. Risk of complications can be reduced by following your surgeon's instructions before and after the surgery.*

Editor's Note: This is part two of a multipart article on plastic surgery. This series was begun in the September/October '04 issue with a discussion of the most common surgical procedures, with more information on the DAN website. Read about other surgeries as well as non-surgical cosmetic procedures at [www.DiversAlertNetwork.org/alertdiver](http://www.DiversAlertNetwork.org/alertdiver)

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**Goal of Procedure:** Goals are many and varied – to have larger breasts; to balance the size or shape of uneven breasts; to make the breasts more proportional with the rest of the body; to enhance breasts that have lost volume and shape due to pregnancy, nursing, weight loss or age; and to reshape or reconstruct the breast after surgery. Individuals ineligible for breast augmentation include women who are pregnant, nursing or have breast cancer.

**What It Involves:** In this augmentation, surgeons surgically place a saline or silicone gel-filled implant in each breast to push the breast tissue forward. Implants are empty sacs made out of silicone elastomer.

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The patient is put under anesthesia; the chest area is cleaned and marked to guide the surgeon. Then the surgeon lifts the breast tissue to create a pocket above or below the pectoral muscle for the implant. The empty implant is inserted and positioned through a small incision (generally less than an inch), then first pumped with air to help open and stretch the tissue and the pocket. Next, the surgeon molds and positions the implant manually. The air is suctioned out, and then the implant is filled with saline to a predetermined volume (silicone gel implants already are filled). At this point, surgeons may situate the patient upright to check for symmetry and balance.

If all is fine, the fill tube is removed and the valve is sealed. Drainage tubes may be placed to allow removal of blood and fluids that accumulate during surgery. Finally, with sutures or with glue, the incision is closed, and the patient may be wrapped in special bras and bandages.

Depending on anatomy, breast condition and other factors, the implant can be inserted through four different incision styles; the patient and doctor must decide which is best.

## Types of Incisions

The **inframammary incision** is made on the underside of the breast at the inframammary fold, where the crease of the breast meets the chest. Many surgeons prefer this method because it provides great control of final placement of the implant. The disadvantage is a visible scar in the breast area. Also, if a patient uses bigger or smaller implants on later surgeries, the initial scar will be placed differently on the breast and might not be as concealed.

With the **periareolar incision**, made on the lower edge of the areola (the dark circle around the nipple), scars tend to heal well, and surgeons have desired control over implant placement. But since the scar is on the breast, any **scar complication** (e.g., redness, swelling) will be more visible. The incision is associated with a greater inability to lactate and greater sensitivity or numbness in the nipple and breast. On women with smaller areolas, the incision might extend past the areola. Also, with this incision, a surgeon must use a protective “sleeve” around the implant, so that natural bacteria found in breast tissue will not contaminate the implant.

The **axillary incision** is in each armpit. With this method, surgeons typically use an endoscope. The scars are tucked away in the natural folds of the armpit. However, possible later surgeries will require another incision site, thus leaving more scars. The doctor will also be working away from the breast, which may impede proper implant placement.

In the **transumbilical (TUBA)** method, the implant is inserted through the navel. An endoscope travels under the skin of the abdomen through subcutaneous fat up to the breast. The surgeon removes the endoscope and slips the implant through the tunnel, filling the implant with a syringe through the navel. The entire operation takes 30-45 minutes, less than other methods; due to little tissue trauma, a patient has a faster recovery. And there is only one incision, on the rim of the navel. Due to the elasticity of the stomach's skin, that incision is potentially smaller than the others.

Yet, if further surgery is required, the surgeon will have to use another incision method, thus creating more scars. With this method, surgeons find it is much more difficult to place implants properly under the muscle, and some implant manufacturers do not endorse using it.

## Implant Factors

Implants can vary widely due to many factors, including:

- **Sizes** – Implants are measured from 125 to 1,200 cubic centimeters. Traditional cup sizes are not used because the patient's original breast size contributes to the final size. For example, to get to a D cup in the end will require different size implants on someone with an original A cup versus one with an original C cup.
- **Types** – Round implants vary in projection and diameter. Contour implants also vary in height, width and projection. Depending on the implant's shape, the diameter may range from 9.4 to 15.6 centimeters and the projection range from 3 to 7.4 centimeters. Implants vary in the amounts of projection.
- **Volume** – Depending on preferences, the same size implant can require different amounts of saline injected. Most implant manufacturers recommend filling the implant between their listed minimum and maximum amounts to help prevent rippling, deflation and sloshing.

With these considerations, many doctors have patients “try on implants” before making a decision. This is done by inserting different sized implants into a sports bra or using special bras with different-sized implants already attached.

## Implant Sites

There are three potential implant placement sites. The **subglandular** procedure (also known as over, retro glandular and submammary) places implants on top of the pectoral muscles between the chest wall and breast tissue. Benefits include no muscle disturbance, shorter surgery and recovery time, tandem sagging and less pain. And implants are more accessible for replacement or removal than with other placements.

## Disadvantages include:

- implants placed in this manner are more palpable and potentially visible if the patient has little breast tissue, and thus look more “fake”;
- mammogram readings can be difficult because the implant obscures some of the glands, requiring additional views that insurance may not cover; and
- a common complication is capsular contracture, where a scar capsule tightens around the implant and compresses it, causing pain and displacement.

For a **partial submuscular** (also known as partial-under or partial sub-pectoral), all but the lower third of the implant is placed behind the pectoral muscle. Surgery is more invasive than subglandular, as muscle must be separated, making surgery and recovery times longer, and implants may appear distorted while one flexes. Also, there is a greater chance of “bottoming out” (implant displacement), because the lower third of the implant is supported only by skin. In bottoming out, a loss of tissue support at the bottom of the breast makes implants drop too low on the chest, making the nipples higher on the breast. Surgeons remedy bottoming out by re-creating or restoring the pocket with permanent sutures.

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But the hidden nature of partial submuscular implants makes them less palpable and less likely to create visible rippling. Mammography images are more easily read because the implant is not blocking views of the glands, and there is a lower risk of capsular contracture. Partial implants take longer to “settle,” but over time they appear more natural.

For **complete submuscular** placements (also referred to as complete-under, total submuscular, total sub-musculofascial, and full unders), the implant is covered and supported by the pectoral muscle and other muscles and tissue. The surgery and recovery time take longer than subglandular, the placement is more painful because the muscle has been distressed, and the implant is more difficult to access when replacing or removing.

Because there is more support than just skin, however, the chance of “bottoming out” is reduced from partials. Although implants placed under the muscle are initially high, they settle to look very natural because the more tissue that covers an implant, the more natural it will look and feel. This “natural cover” reduces rippling and palpability.

## Getting Ready

Medical preparation before surgery should include the following:

- Get a mammogram to help establish a baseline for postoperative mammograms.
- Stop taking aspirin, ibuprofen, vitamins and herbs at least two weeks (some surgeons say 30 days) before surgery; they may increase the risk of bleeding.
- Disclose to the physician all medication, herbs and vitamins being used.
- Do not drink any alcohol for at least 24 hours prior to surgery.
- Quit smoking four to six weeks before surgery. Smoking reduces the oxygen levels in the blood and impedes healing.

**Length of Procedure, Recovery Time and Possible Complications:** Except for TUBA

(transumbilical), surgery takes between one and three hours, depending on implant placement and the surgeon’s skill and experience. Typically, general anesthesia is used, especially for placements under the muscle; local anesthesia with sedation may be used for an over-the-muscle placement. Surgery can be performed at an office facility or a hospital outpatient facility. Occasionally, a patient will stay a day or two at a hospital. Someone should drive a patient home and monitor recovery for at least 24 hours after surgery.

After surgery, patients can expect pain and sensations lasting for days or even weeks. These can include:

- sudden chest pains due to nerve

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regeneration (during surgery nerves have been disturbed and need time to heal and regenerate);

- tightness in the breast area;
- a burning sensation or sensitivity in the nipples;
- swelling due to fluid retention;
- implant noises from fluid buildup or air bubbles as they settle;
- nausea;
- constipation;
- itchy skin due to skin stretching;
- mood swings; and
- depression.

For each patient, the pain and discomfort vary in intensity and duration. Size (larger implants can have more pain and bruising), technique and complications contribute to the postoperative pain. Most pain can be controlled by prescribed medication.

Even with the possible pain, patients will be up and moving within one to two days. They often can return to work within days and resume moderate activities fairly quickly (strenuous activities may take a few months). Stitches are usually removed in seven to 10 days. A patient may then require a surgical

bra. Sleeping in an upright position for a few weeks after surgery and not bending over or straining the breast area should spur recovery.

The first post-operative visit will be within three weeks. Additional follow-ups can vary from yearly to less regularly, depending on the surgeon.

Incision scars are usually small (from 3 to 7.5 centimeters depending on implant size and texture and the surgeon’s skill) and heal nicely. Initially, scars will be pink and firm, then fade after several months while remaining the same size. To diminish scarring, some doctors advocate using Vitamin E, when the incision closes after a few weeks; surgical paper strips to take the tension off the incision, which fall off on their own and help the scar to flatten and fade; or silicone sheeting stuck to the breast. If scarring is severe, such medical options as steroid therapy and excision are suggested.

As with scars, doctors are not in agreement about recommending breast massage to keep the implants soft and prevent capsular contracture. Those who do suggest massaging the breast anywhere from one day to one week after surgery, three times a day. After three weeks, women are encouraged to massage once a day the rest of their lives.

Some doctors encourage patients to do pocket quadrant exercises to move the implants up, down and side to side and hold them in these different places for a few seconds. In theory, this keeps the pocket spacious and the capsules loose and elastic.

Besides bottoming out and capsular contracture, other potential risks exist. Implant deflation and rupture can happen for several reasons, instantly or gradually. If a shell does rupture, the saline is absorbed into the body with no health risks. There can be hematomas (blood pooling in a cavity or wound) or seromas (a collection of the watery part of the blood) causing swelling, pain and bruising. Small hematomas and

seromas can be absorbed in the body; larger ones might require surgical drains.

Infections, use of steroids in the surgical pocket, smoking or excessive heat or cold therapy have negative affects on wound healing and increase the chances of tissue breakdown and extrusion (exposure of the implant). This may require surgery to remove or replace the implant.

Implants obscure breast tissue, and calcium may deposit in the tissue capsule around the implant and be mistaken for cancer on a mammogram. Such situations take time and more radiation to correct, and early detection of breast cancer could be impeded. Patients should look for a radiology or mammography technician familiar with breast implant techniques to perform mammograms.


Some complications are cosmetic. A “double bubble” happens when the implant sits higher on the chest as the natural breast tissue sags below, giving the appearance of two breasts on top of each other. A “double bubble” also can occur over time as the natural breasts sag due to age, gravity or pregnancies, but the implants do not. With a breast lift in conjunction with the implant or in a later surgery, this undesirable effect can be avoided.

If implants move to the center of the chest, cross the breastbone and touch each other where cleavage would normally be seen, this creates the look of one continual implant across the chest known as symmastia (also called “breadloaf”). This happens when the surgeon unknowingly cuts the muscle attached to the sternum. That muscle extends horizontally across the implants, holding them in place. Surgeons can repair symmastia by removing the implants and then reattaching the muscle with permanent sutures.

Implants are not meant to last a lifetime. Future surgery probably is needed to remove or replace them. Puckering of breast tissue is possible without removal or replacement, as are deflation, rupture, capsular contracture, infection and calcium deposits.

**Waiting Time From Procedure Until Diving:** There’s a difference of opinion here. Dr. Golembe believes about three months’ recovery is necessary. Dr. Potkin says, “Pressure is an issue; and therefore diving should be avoided for approximately six months. The type of implant is important, since some allow the release of subcutaneous air, which could be problematic.”

However, Dr. Golembe said that the amount of time to get air out of saline implants typically is no more than 6-12 hours after surgery. He believes the six-month recommendation is too extreme.

Consult with your doctor if you’re considering breast surgery; having your own healthcare professional to advise your surgeon is always a wise choice. 

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