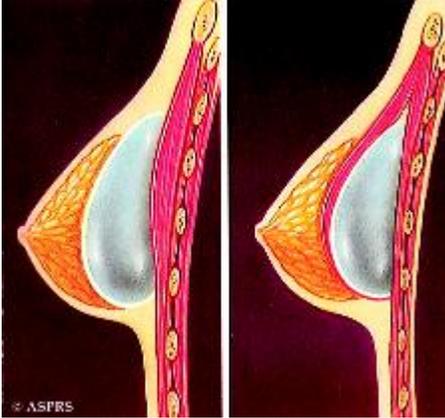


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### Breast Augmentation: Position of Breast Implants above or below the Pectoral Muscle

During a consultation for **breast enhancement** one of the first decisions a patient and her surgeon must make is where to place the implant. There are two choices: below the gland of the breast and above the pectoral muscle, or **below** the pectoral muscle. Neither approach is perfect and the needs of each patient must be considered on an individual basis.



The **pectoral muscle** is a large almost triangular muscle that sweeps across the chest with one point at the shoulder and one side attached to the chest bone.

The original method of surgery was to place the implant beneath the gland of the breast and above the muscle. This worked well for most patients who got a good cosmetic result. However a significant number of patients, perhaps as high as one in four, developed hardening of the layer of scar tissue around the implant.

Surgeons were on the look out for ways to reduce the number of patients who developed hardening or contracture of the capsule. During the 1970s surgeons began to reconstruct the breast after cancer. In these patients there was no breast tissue and so the implant was always placed beneath the muscle. Experience with this operation and in other areas showed that placing the implant beneath the pectoral muscle significantly reduced the risk of hardening of the capsule. Many surgeons began to routinely place the implant beneath the muscle in all patients.

As time passed, the submuscular position was also found to have problems of its own. There is a change in shape of the breast whenever the pectoral muscle contracts, for example when working out. Another problem is that the implant always remains high because of the support of the muscle, but any existing breast tissue begins to droop as the patient grows older. The result may be a bilobed breast.

During the 1980s textured implants, with a rough surface, were introduced. Many surgeons feel that these reduce the risk of hardening sufficiently for them to place the implant above the pectoral muscle and not have the disadvantage of the submuscular approach. In addition saline filled implants, which are the only type of implant available in the United States at this time seem to be less likely to cause hard capsule formation.

Many other factors need to be considered when deciding on the position of the implant these include: the size of the implant, the possibility of wrinkling of the implant and the patient's choice of incision.

In the past it was felt that placing the implant under the muscle eliminated the risk of wrinkling. This is not true and many patients with implants placed under the muscle still experience wrinkling.

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Ultimately the choice of implant position must be tailored to the patient's needs. Each surgeon will have a different experience and develops a technique with which he or she gets their best results. There are no fixed rules or clear cut answers when it comes to implant position. However if you already have laxity of breast skin (**breast ptosis**), a "B" cup or larger, or you like to lift weights, then placing the implant below the muscle may not be for you. As always, your best decision is made in consultation with your own Board Certified Surgeon.

### **BREAST AUGMENTATION OR ENLARGEMENT**



More details can be obtained from your own surgeon, Dr. Keshishian. For more information see the most frequently asked questions ([FAQs](#)) about breast enlargement.

Indications: This operation is done to enhance or enlarge the breast. It remains one of the most popular cosmetic surgery operations. Many materials have been used to enlarge the breast. Most have fallen into disuse and implants remain the method of choice.

There are two types of patient who need this operation. First, those who have never developed breast tissue and second, those who had breast tissue before pregnancy and lost it after they had children.

This operation does not tighten the breast or raise the nipple. If you have loose skin or the nipple is low you may need a mastopexy.



Method: There are many ways to perform breast enlargement. The method must be tailored to the individual patient needs. The principal is to create a pocket under the breast tissue and place an implant into that pocket.

In some patients the surgeon places the implant under the pectoral muscle and in others under the gland of the breast. The operation is done under either local anesthetic (you are awake) or general anesthetic (you are asleep). Most of the time this is an outpatient operation and a stay in the hospital is not needed.

Problems: All operations have some risk. The risks of surgery are divided into two groups: First those that may be seen in all operations and second those that are unique or special for this operation. In the first group, the main risks are swelling,

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bruising, bleeding, infection, a scar and numbness or change in feeling. This list is not inclusive and you should speak with your surgeon regarding risks and complications based on your individual health history.

The main problems which are special for this operation are hardening of the capsule around the breast, leakage of the implant and changes in mammography.

Postoperative care: The recovery takes one to two weeks. Most people are back to work within a week or two.

### **How is a breast augmentation done?**

The underlying concept of a breast augmentation is the same no matter how the operation is done. A pocket is made under the breast and an implant is placed in this pocket. Only one kind of implant is available for general use in the United States. This is a saline filled implant. This has a silicone plastic outer bag and is filled with salt water. Elsewhere in the world silicone gel implants are available. Other implants, including those filled with a soy products, are under investigation at this time but a return to gel implants seems likely, including in the United States.

Saline filled implants are available with two types of surface, rough and smooth. The traditional implant has a smooth surface and was found to have a higher rate of hardening of capsule. The smooth implant is now used mainly under the muscle. A rough or textured implant is commonly used above the muscle because it seems to reduce the risk of capsular hardening when put over the muscle. It is important to know what type of implant you have placed because after surgery most surgeons do not recommend massaging textured implants but do recommend massaging smooth implants

Implants also come in two main shapes, round or pear shaped (anatomical). Some surgeons believe that the anatomical implants produce a more natural shape to the breast. Other surgeons disagree. Some believe that anatomical implants may have an increased risk of folding of the silicone envelope, which may lead to tearing.

The implant can be placed under the gland of the breast or more deeply under the muscle of the chest wall. One position is not better than another. The position must be decided on an individual basis. There is no perfect operation so wherever the implant is placed there will be good and bad effects. In general placing the implant under the muscle places it further from the surface so that the implant is less likely to be felt. Capsule formation is also less likely to contract. Placing the implant over the muscle usually does not have the disadvantage that when the muscle contracts the breast changes shape. Patients who already have a significant amount of breast tissue are often advised to have the implant above the muscle because as time passes the implant will remain high because of the muscle but the normal breast will tend to droop which may cause a bilobed or double breast.

Several incisions can be used to position the implant. Again no incision is without problem and no approach is perfect. Each case must be decided on the needs of the patient. Incisions in the arm pit are sometimes used to put the implant under the muscle. This is a direct route to the pocket but has the disadvantage that the incision

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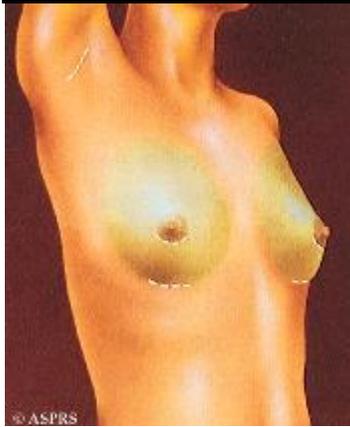
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is always visible when the arms are raised. An incision around the nipple may not be appropriate in women who may want to breast feed in the future. An incision on the undersurface of the breast is always concealed by clothing and provides a direct access to the pocket. If placed too high it may become thick and if placed too low it will show if the arms are raised and a bikini or bra rides up. Some surgeons use an incision in the navel and burrow up under the skin into the breast area. This is called an endoscopic approach. It is suitable for some patients but is not widely used.

The pocket is made a little larger than the implant. The pocket for smooth implants is usually made significantly larger than for a textured implant. After the pocket is made the surgeon checks for bleeding and often washes out the pocket with an antibiotic to reduce the risk of infection.

The incision is then closed. There are many different methods used to close the skin. Most doctors use stitches and sometimes-dissolvable stitches are used.

Surgeons use many different kinds of bandage and post surgical bra. They all have in common a need to apply some compression and keep the area rested.

## **BREAST AUGMENTATION**

Many materials have been used to enlarge the breast. Most have fallen into disuse and implants remain the method of choice.

- The most common method is the use of implants. These have been used since the early 1960s. The first implant was made of silicone and introduced in 1964. Silicone gel implants are the "gold standard" by which other methods are judged. They feel more natural and are less likely to ripple or wrinkle than saline implants. Although they have the problems of any implant such as capsular formation, the association with autoimmune illness has not been confirmed by long term studies.

The three main differences between saline implants and silicone gel implants are:

- gel implants feel more natural
- saline implants are more likely to leak from the valve
- saline implants have more wrinkling

Saline implants are freely available but in the United States gel implants are available in a research protocol only. People that may be candidates for the use of gel implants in the protocol include reconstruction after cancer, in association with skin tightening (mastopexy) and when there is a significant asymmetry of shape and size of the breast. Outside of the United States gel implants are more freely available.

- Silicone and paraffin were injected directly into the breast. This method is no longer used because of the high risk of complications, such as granulomas, loss of skin and excess scar formation. Many women who had these injections developed very misshapen breasts.

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- Injections of the patients own tissue such as fat, muscle, omentum, lipomas and skin-fat grafts have all been used to enlarge the breast. Unfortunately the results are unpredictable. Scarring and irregularity are a problem but more significant is the development of microcalcifications that make mammography less reliable.

- Various non-surgical methods such as creams and suction pumps have also been used. The results are unreliable. In the case of the pump, although some increase may be noticed its use is cumbersome and the long term effects unknown.

After breast augmentation the development of a layer of scar-like tissue round the breast implant is a natural process. This is called capsule formation. The body is probably attempting to extrude the implant that it perceives as a foreign body.

As the implant is compressed it changes in shape from flat to spherical, which is the smallest surface area for that volume.

Not all capsule formation is clinically significant and plastic surgeons grade the amount of contraction using several different systems.

The cause of capsular contracture is unclear. Many surgeons feel it is more likely after infection or bleeding. Some surgeons have tried to reduce the chances of capsule formation by using steroids either in or around the implant.

It is more common when the implant is placed above the pectoral muscle and when smooth implants are used. It is less common with textured implants.

Most contractures develop within the first six months. Although late contractions do occur they are usually preceded by an injury or infection.

When the capsule is examined under the microscope it shows a layer of collagen intermingled with collagen making cells (fibroblasts). When these fibroblasts are examined under the electron microscope many are myofibroblasts, which are a special type of cell which can contract much like muscle.

The treatment depends on the severity of the contracture and ranges from observation and no active treatment to surgical release of the capsule.

### **What size of implant to use**

Any woman who has been fitted for a bra knows that every bra maker seems to have a different method of measuring cup size. Some patient can be two or even three different sizes depending on the manufacturer. This makes deciding on size difficult. Even though it is not usually possible to make a breast look like a picture it may help to bring your surgeon a picture from a magazine or catalogue. This helps your surgeon understand your expectations and desires.

Many patients worry that after surgery they will be too big or too small. This can happen because it is impossible to always gauge the exact patient need. However it

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is much less common than you might imagine. Most surgeons are well trained to advise about this. Some patients will always think the breast is too small after surgery no matter how large the implant. This may be because after a lifetime in which their body image is fixed on the idea that they have a small breast, nothing will change it, not even large implants.

Implants usually come in metric measurements. Many surgeons assess the size increase, and therefore the implant needed, by using the formula that 1(one) cup size = 150 ml (cc). A two cup size increase would need about a 300 cc implant. This amount needs to be added to the amount of breast tissue you have now. For example if you are now an "A " cup then a 300 cc implant may bring you close to a full "C". Unfortunately many factors need to be considered in deciding about size and shape and your surgeon can talk with you about this.

A final point of confusion for patients is that as they go from surgeon to surgeon they may be told that different size implants produce the same increase. Remember that if the implant is placed below the muscle a larger implant may be needed, often as much as 100 cc or more. So confirm with the surgeon if the size described is for above or below the muscle.

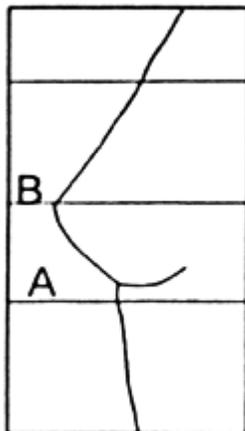
Surgeons usually consider 1 cup size to be about 150 mls or cc. This means that when deciding on an implant size a 2 cup size increase is approximately 300 cc. When the implant is under the muscle you need to allow about 75-100 cc more. However none of this will help you when trying to decide what size of bra you need now or after surgery because different manufacturers cup sizes vary.

There are two important measurements to make. These measurements are in inches and apply mainly to the North American market.

The first is the band size around the chest. Use a tape-measure around the chest just under the breast. Keep the tape level on the front and back.

The second is the cup size. You should measure around the breast at the fullest part. The difference between this measurement and your chest band size is your cup size.

Each inch of difference is a cup size.



#### **Bra Size and Fit**

**Bra sizes** are made up of two components

**(always measure while wearing your own bra):**

An even number that represents the **back size** (32, 34, 36, etc.) determined by the size of the torso. (see Figure 1, line A)

A letter that indicates the **cup size** (A, B, C, etc.) determined by the size of the breast itself. (see Figure 1, line B)

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**To determine the back size**

(torso measurement): Have someone stand at your side and bring a tape measure snugly around your ribcage, directly under the breast (see A in figure above).

Add 5 to the measurement (i.e. if "A is 29", the back size is 34)

After 33 inches, only add 3 inches to the back measurement (i.e. if "A is 35", the back size is 38)

**Verify the back size:**

Measure around the top of your breasts (the line above B in the figure above). This measurement should equal your back size calculation. For example if you measured 29 inches around your ribcage, the calculation is  $29 + 5 = 34$ . The measurement above your breasts should equal 34.

Hints:

1. If the back size comes out to an uneven number, try the next size up.
2. If you are in-between sizes or you are having difficulty finding the correct fit, then if you go up in cup size come down in band size or if you go up in band size come down in cup size. For example, if you are wearing a 42D, but it is a little too snug around the band, then you would move up to a 44C.

**To determine the cup size**

(breast measurement):

Have someone stand by your side and bring a tape measure loosely around the fullest part of the bust (see B in figure above).

Subtract the back size from this measurement (ie. if line "B" is measurement is 37" and the back size (line "A" measurement +5) was 34, the difference is  $3 =$  a C cup). This difference determines the cup size (see chart below).

The chart below should be used as a guide only. Sizes actually vary slightly from one manufacturer to the next.

Difference in inches between the bust measurement and the back measurement, showing measurements.														
0"-1/2"	1"	2"	3"	4"	5"	6"	7"	7-1/2"	8"	9"	10"	11"	12"	13"
AA	A	B	C	D	DD, E	DDD, E, F	F/G	FF/H	I/H	H, I, J, GG	I, J	J, K, HH	J	JJ