

**Subject: Breast Reconstruction  
Following Mastectomy or  
Lumpectomy**

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## **INSTRUCTIONS FOR USE**

*This Medical Necessity Guideline outlines the factors CareAllies considers in determining medical necessity for this indication. Please note, the terms of a participant's particular benefit plan document or summary plan description (SPD) may differ significantly from the standard upon which this Medical Necessity Guideline is based. For example, a participant's benefit plan document or SPD may contain a specific exclusion related to the topic addressed. In the event of a conflict, a participant's benefit plan document or SPD always supercedes the information in this Medical Necessity Guideline. In the absence of a controlling federal or state coverage mandate, benefits are ultimately determined by the terms of the applicable benefit plan document or SPD. Coverage determinations in each specific instance require consideration of 1) the terms of the applicable group benefit plan document or SPD in effect on the date of service; 2) any applicable laws/regulations, and; 3) the specific facts of the particular situation. Medical Necessity Guidelines are not recommendations for treatment and should never be used as treatment guidelines. ©2007 Intracorp/CareAllies*

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**Breast reconstruction following mastectomy or lumpectomy is governed by Federal and/or State mandates.**

**Breast reconstruction following mastectomy or lumpectomy is considered medically necessary for EITHER of the following:**

- **breast reconstruction procedures performed on the diseased/affected breast (i.e., breast on which the mastectomy/lumpectomy was performed), including:**
  - tissue/muscle reconstruction procedures (e.g., flaps), including all of the following:
    - transverse rectus abdominus myocutaneous (TRAM) flap
    - latissimus dorsi (LD) myocutaneous flap
    - deep inferior epigastric perforator (DIEP) flap
    - superficial inferior epigastric perforator (SIEP) flap
    - superior or inferior gluteal free flap
    - Ruben's flap
  - implantation of tissue expander
  - implantation of U.S. Food and Drug Administration (FDA)-approved internal breast prosthesis
  - areolar and nipple reconstruction
  - areolar and nipple tattooing
  - reconstructive surgical revisions
  - breast-implant removal and subsequent reimplantation
- **breast reconstruction procedures performed on the nondiseased/unaffected/contralateral breast, in order to produce a symmetrical appearance, including:**
  - breast reduction by mammoplasty or mastopexy
  - augmentation mammoplasty
  - augmentation with implantation of FDA-approved internal breast prosthesis when the unaffected breast is smaller than the smallest available internal prosthesis
  - areolar and nipple reconstruction
  - areolar and nipple tattooing
  - reconstructive surgery revisions to produce a symmetrical appearance

- breast implant removal and subsequent reimplantation when performed to produce a symmetrical appearance

**Removal of either a saline-filled OR silicone gel-filled breast implant is considered medically necessary when associated with breast reconstruction following mastectomy or lumpectomy for ANY indication, including for the purpose of producing a symmetrical appearance of the nondiseased breast. Refer to the Breast Implant Removal medical necessity guideline for additional information on breast implant removal.**

**Following removal of a breast implant, the subsequent surgical implantation of a new U.S. Food and Drug Administration (FDA)-approved breast implant is considered medically necessary for EITHER of the following:**

- breast reconstruction of a diseased or affected breast following mastectomy or lumpectomy
- creation of a symmetrical appearance in the contralateral/nondiseased breast following mastectomy or lumpectomy in the opposite breast

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## **General Background**

Breast reconstruction was originally designed to reduce post-mastectomy complications and to establish symmetry between the surgical breast and the contralateral breast. Surgical procedures that are performed to establish symmetry can include: breast reduction; breast augmentation with a FDA-approved breast implant; and/or areola-with-nipple reconstruction and nipple-area tattooing. Breast reconstruction after mastectomy has evolved over the last century to become an integral component of therapy for patients with breast cancer. Reconstruction can occur immediately after a mastectomy, or be delayed for weeks or years until a patient undergoes radiation, chemotherapy, or determines whether they want breast reconstruction.

Current methods of reconstruction are broadly classified into autologous tissue or prosthetic material. Autologous tissue reconstruction uses the patient's own tissue (i.e., skin, subcutaneous tissue, and muscle) from another site to reconstruct the missing breast. Prosthetic reconstruction uses tissue expansion to create a pocket for the placement of a breast implant. Occasionally, a combination of autologous tissue and an implant is indicated. The selection of the reconstructive technique is based on anatomic patient factors, including: the laxity and thickness of the remaining chest-wall skin; the condition of the chest-wall musculature; the size of the opposite breast; and the availability of suitable autologous tissue donor sites. Clinical factors (e.g., diabetes, obesity, smoking history, and other chronic illnesses) are considered to identify the appropriate method of reconstruction (Petrek and Disa, 2005).

### **U.S. Food and Drug Administration (FDA)**

The FDA has approved four breast implants for marketing in the U.S. In May 2000, Mentor Corp., Santa Barbara, CA and Allergan Corp. (formerly Inamed), Irvine, CA received premarket approval for saline-filled breast implants. These implants were approved for breast augmentation in women age 18 or older and for breast reconstruction in women of any age (FDA, 2006a).

In November 2006, Allergan and Mentor received premarket approval for their silicone gel-filled breast implants (i.e., Inamed<sup>®</sup> Silicone-Filled Breast Implants and Mentor MemoryGel<sup>™</sup> Silicone Gel-Filled Breast Implants). These implants were approved for breast augmentation in women age 22 or older and for breast reconstruction in women of any age. All breast implants other than these four approved devices are considered investigational devices, including the more-cohesive ("gummy bear") implants. For a patient to receive an investigational breast implant in the U.S., they must enroll in a clinical study (FDA, 2006a).

The FDA labeling for silicone and saline breast implantation states breast implant surgery should not be performed in women with: an active infection, existing cancer or precancer of a breast that has not been adequately treated, or who are pregnant or nursing (FDA, 2006b).

As a part of the Premarket approval, the FDA is requiring the manufacturers of silicone breast implants to comply with the following conditions (FDA, 2006a):

- Continue their core studies until all patients have completed their 10-year evaluation in order to assess the long-term clinical performance of their products. This involves:
  - collect data via annual physician follow-up evaluations
  - give all patients MRIs every other year
  - evaluate all patients whose breast implants were removed without replacement through 10 years
- Conduct separate 10-year large post-approval studies that will:
  - involve a large number of silicone gel-filled breast implant patients (approximately 40,000)
  - involve a control group of saline-filled breast implant patients
  - provide information about certain endpoints: local complications; rates of connective tissue disease and its signs and symptoms; rates of neurological disease and its signs and symptoms; potential effects on offspring of women with breast implants; potential effects on reproduction and lactation; rates of cancer; rates of suicide; potential interference of breast implants with mammography; and patient compliance with MRI recommendation and rupture rates
  - survey patients annually using web, mail, or telephone questionnaires
  - have physician evaluations at years one, 4–6, and 9–10 for Mentor and years one, four, and 10 for Allergan to collect local complication data.
- Continue their laboratory studies to continue to further characterize the modes and causes of failure of explanted devices over a 10-year period.
- Have an independent group conduct a focus group study of the format and content of the approved patient labeling.
- Distribute approved patient labeling to women considering silicone gel-filled breast implants as part of a formal informed decision process, and monitor the process to ensure that patients are being informed of the risks and benefits.
- Stop new patient enrollment into the adjunct studies and continue to follow all currently enrolled patients through the final five-year study time point.
- Require participation in the company's physician training program for physician access to the product.
- Comply with FDA's requirements for tracking these devices from their manufacture through the distribution chain to implantation.

The FDA intends to present an update on the status of the conditions of approval at public Advisory Panel meetings in five and 10 years, and at any other time the FDA decides is appropriate.

### **Prosthetic Reconstruction**

**Breast Implants:** Breast implants can be inserted at the same time as the mastectomy or in two stages, using an implanted tissue expander in the first stage followed by removal of the expander and insertion of a permanent breast implant. The FDA-approved implant is placed either deep in the breast on the pectoral fascia (submammary) or beneath the pectoralis major. The advantages of tissue expander implant reconstruction are the reliability, simplicity, and avoidance of donor site morbidity. Surgical complications of breast implants are similar to those encountered with other breast surgeries: infection, bleeding, change in nipple sensation, malposition, delayed healing, and anesthetic accidents. Local complications associated with implanted breast prostheses include capsular contracture, persistent infection, implant extrusion, tissue necrosis, and implant deflation or rupture. These conditions, when they

become clinically significant, may require removal of the implant (Petrek and Disa, 2005; Wilhelmi and Phillips, 2004).

Indications for implant reconstruction include: bilateral reconstruction; patients requiring augmentation in addition to reconstruction; patients not suited for long surgery; a lack of abdominal tissue; patient unwilling to have additional scars on either their back or abdomen; and a small breast mound with minimal ptosis. Relative contraindications to implant reconstruction include: young age (i.e., may need implant replaced multiple times); patient unwilling to follow up; very large or ptotic breast. The contraindications to implant reconstruction include: silicone allergy; fear of implants; previously failed implants; or need for adjuvant radiation therapy (Wilhelmi and Phillips, 2004).

### **Tissue Expanders**

Following mastectomy, some patients have inadequate elasticity in the remaining tissue to accommodate and support a breast implant. For these patients, tissue expanders can be inserted under the chest muscle or skin. The expander is an empty one balloon-like container that, over time, is injected with saline. This inflation causes the tissue to expand. The tissue expander is surgically removed once an adequate pocket has been established, and the permanent implant is then inserted (Petrik and Disa, 2005; American Cancer Society, 2004).

### **Autologous Tissue Reconstruction**

Methods of autologous tissue breast reconstruction include local flaps and distant flaps. Local flaps rely on transposition of muscle, subcutaneous tissue, and skin into the mastectomy defect based on the attached native blood supply of the muscle (e.g., latissimus dorsi myocutaneous (LD) flap and the pedicled transverse rectus abdominus myocutaneous (TRAM) flap). Distant flap breast reconstruction requires the use of microvascular free-tissue transfer (e.g., free TRAM flap, deep inferior epigastric perforator [DIEP] flap, superficial inferior epigastric artery perforator [SIEP] flap, inferior or superior gluteal flap, superior gluteal artery perforator flap, and the Reubens flap). Breast reconstruction using these donor sites relies on harvesting the flap with its vascular pedicle, which is anastomosed using microsurgical technique to appropriate recipient vessels in the mastectomy site (Petrek and Disa, 2005). The choice of procedure for a given patient is affected by her age, her health, her contralateral breast size and shape, her personal preference, and the expertise of the reconstructive surgeon (Wilhelmi and Phillips, 2004).

### **Tissue Flap Procedures**

**Transverse Rectus Abdominus Myocutaneous (TRAM) Flap:** The TRAM flap is the most commonly performed autologous reconstructive procedure. There are three types of TRAM flaps: unipedicle, bipedicle, or free. Pedicle flaps involve leaving the flap attached to its original blood supply and tunneling it under the skin to the breast area. Free flap involves cutting the flap free of skin, fat, blood vessels, and muscle from its original location and attaching the flap to blood vessels in the chest area. The advantage of these procedures lies in the consistency of the reconstructed breast and its aesthetic appearance. Adverse reactions are rare because the body does not react to the patient's own tissue as a foreign body; therefore, capsular contractures do not occur. This constructive technique also improves over time as scars fade and the tissue softens into a more natural appearance. These procedures are indicated for patients with (Zenn, et al., 2005):

- large tissue requirement after a radical mastectomy
- history of radiation to the chest wall
- small or large opposite breast that is difficult to match with an implant
- previous failure of implant reconstruction
- excess lower abdominal tissue

The following factors place a patient at higher risk for complications and are therefore considered relative contraindications to TRAM flap surgery (Zenn, et al., 2005; Wilhelmi and Phillips, 2004):

- cardiac disease
- diabetes
- pulmonary disease

- history of pulmonary embolus or deep venous thrombosis
- collagen-vascular disease
- unstable psychiatric disease
- obesity (> 25% over ideal body weight)
- older patient (over age 70)
- cigarette smoker unwilling to quit
- previous surgery that has interrupted blood supply to the TRAM flap

A TRAM flap may not be appropriate for a patient desiring future pregnancy, but it is not considered contraindicated.

Though TRAM flap surgery has gained in popularity over the past 20 years, it is not always successful. The entire rectus abdominus muscle must be used to perform the pedicle flap procedure, while the free TRAM flap requires only a small portion of the muscle. Abdominal complications resulting from this surgery include loss of abdominal strength, abdominal bulge and hernia formations. It is recommended that reconstruction be delayed when adjuvant chemotherapy is planned, as complications of the reconstruction can be detrimental in beginning the patient's therapy.

**Latissimus Dorsi Myocutaneous (LD) Flap:** The LD flap moves muscle and skin from the back to reconstruct the breast. The LD flap is ideally suited for single-stage reconstruction for patients with small breasts and a moderate degree of ptosis. The LD flap can be used to correct lumpectomy defects which require a smaller implant or no implant. Some patients may have weakness in their back, shoulder, or arm after this surgery. Relative contraindications to the LD flap include: planned postoperative radiation therapy, bilateral reconstruction, and significant breast ptosis. Contraindications to the LD flap include: previous lateral thoracotomy and patients with large breast volume who do not desire reduction (Wilhelmi and Phillips, 2004).

**Superior or Inferior Gluteal Free Flap:** The superior or inferior gluteal free flap requires skin, fat, blood vessels, and muscle be removed from the gluteus maximus to reconstruct the breast. This technique is an option for when the abdomen is no longer an alternative for flap transfer. This flap is technically complex and has complications including: seroma, sciatica, unfavorable scar location, and asymmetrical buttock contour (Wilhelmi and Phillips, 2004).

**Deep Inferior Epigastric Perforator (DIEP) Flap:** The DIEP flap procedure uses abdominal skin and subcutaneous tissue while sparing the rectus abdominus muscle. This procedure is an alternative to the conventional free flap. The procedure requires the use of microsurgery to connect tiny vessels. Complications from this procedure (e.g., partial flap loss and fat necrosis) can be mitigated through careful patient selection (e.g., nonsmokers whose vessels, especially veins, should be of adequate number, size, and caliber/quality). If perforators (i.e., vessels) cannot be found with diameters > 1.0 mm, then a TRAM flap should be performed (Petrek and Disa, 2005; Kroll, 2000).

**Rubens Flap:** The Rubens flap is based on the circumflex iliac vessels and is an option for patients who have an excess of soft tissue over the hips. Because this reconstructive procedure is limited in bulk and skin envelope, and often requires a balancing procedure on the contralateral hip, it is not usually considered as a first option for breast reconstruction (Wilhelmi and Phillips, 2004).

### Literature Review

Alderman et al. (2006) used a multicenter prospective cohort study design to address the concerns of abdominal wall morbidity with TRAM flap reconstructions. The long-term effects of postmastectomy breast reconstruction on trunk function were evaluated using objective clinical measures. In 183 patients, preoperative and postoperative trunk functional data were objectively measured with Cybex machines for patients with an expander/implant, pedicle TRAM and free TRAM reconstructions. The authors report a 6–19% decrease in flexion peak torque in patients with both free and pedicle TRAM techniques compared with expander/implant reconstruction. No significant difference in flexion peak torque was found between patients with pedicle and free TRAM reconstructions. At two years postoperatively, procedure type, timing, and laterality did not significantly affect the range of motion for trunk flexion and extension. The authors conclude that the effect of these deficits on the patient's day-to-day quality of life remains unclear.

Garvey et al. (2006) retrospectively studied whether the DIEP flap has advantages over the pedicled TRAM flap for breast reconstruction. Records were reviewed over a nine-year period at a single institution. Patients with a three-month postoperative follow-up were studied. A total of 190 women underwent unilateral breast reconstruction (96 DIEP and 94 pedicled TRAM flaps). The patient groups were similar in body mass index, age, preoperative chest wall irradiation and abdominal operations, and cancer stage. The median hospital stay was shorter for the DIEP group than the pedicled group by one day. The operative time for the DIEP group was 5:33 hours compared to 4:46 hours for the pedicled TRAM group. Fat necrosis and abdominal wall hernias were higher for the pedicle TRAM group than the DIEP group. Abdominal wall bulge rates were similar for both groups (i.e., DIEP 9.4% versus pedicle TRAM 14.9%). The authors concluded that DIEP flap reconstruction can be performed with lower morbidity rate and with a shorter hospital stay than the pedicled TRAM reconstruction.

Bajaj et al. (2006) retrospectively reviewed patient data over a five-year period to determine whether there are differences in flap-related complications in donor-site morbidity and in patient-perceived and patient-reported abdominal donor-site strength, pain, and contour irregularities after free muscle-sparing TRAM and free DIEP flap breast reconstruction. A total of 164 patients (203 flaps) underwent either a muscle-sparing TRAM flap or a free DIEP flap performed by two surgeons in one center. Patients were sent a 12-item questionnaire to answer questions about abdominal appearance, postoperative pain, and ability to perform normal physical activities following surgery. Fifty-six percent responded to the questionnaire. Muscle-sparing TRAM flaps were used in 124 patients (98 unilateral and 26 bilateral). DIEP flaps were used in 35 patients (27 unilateral and eight bilateral). In five bilateral breast reconstructions, a muscle-sparing TRAM flap was used for one side, and a DIEP flap was used on the other side. The authors concluded that there is no significant difference in flap-related complications or donor-site morbidity between the free muscle-sparing TRAM flap and the free DIEP flap. The authors advocate using the most expeditious and reliable flap based on the vascular anatomy of the DIEP system.

Behnam et al. (2003) conducted a retrospective review to determine the outcome of TRAM flap procedures to reconstruct the breasts of patients with advanced breast cancer (i.e., stage III or IV). The study spanned a ten-year period (1991–2000) and included 21 women. Of these patients, 20 had stage III disease, and one patient had stage IV disease. Twenty-six TRAM flap procedures had been done on these patients. Five patients had bilateral TRAMs. At a follow-up of 6.5 years, range 2–10 years, complications had occurred in only seven patients. No patients had lost their original flaps because of complications. The results of this study showed that patients with advanced cancer can be considered candidates for TRAM flap procedures with good recovery outcomes anticipated.

### **Monitoring of Tissue Flaps**

Currently, the method used to monitor for postoperative ischemia is aggressive flap surveillance. Originally, clinical examination was used when only free skin flaps and free musculocutaneous flaps were being performed. Skin color, capillary refill, and dermal bleeding were observed to determine the adequacy of perfusion. This method of monitoring can be subjective, because typically more than one examiner is involved, and as more complex flaps were developed, especially buried flaps, the limitations of clinical examination alone became evident. At present, more than 20 different tissue flap monitoring techniques are available, yet there is no consensus on which is the most accurate. The ideal monitor should be noninvasive, reliable, and objective, should react promptly to changes in blood flow, monitor all flap types continuously (i.e., superficial and buried), and be affordable, easy to use and interpret. None of the currently available monitors satisfies all these criteria. Current methods for flap monitoring include intravenous fluorescein, transcutaneous oxygen measurement, tissue pH measurement, pulse oximetry, muscle contractility, photoplethysmography, electrical impedance plethysmography, temperature monitoring, surface Doppler monitoring using low-frequency continuous-wave ultrasound, implantable Doppler monitoring using high-frequency pulsed ultrasound, laser Doppler flowmeter, hydrogen clearance technique, continuous measurement of oxygen tension, and color duplex (Fulda, et al., 2003).

Despite numerous techniques such as Doppler probing and temperature monitoring, clinical assessment remains the gold standard for free flap monitoring. The most common cause of flap failure is venous congestion. If a problem is suspected, the initial response is to remove enough sutures at the bedside to relieve pressure on the flap. The standard of care dictates a rapid return to the operating room to release

tension, evacuate any fluid collections, eliminate sources of vascular pedicle kinking, and examine and possibly revise the arterial and/or venous anastomosis (Burns and Blackwell, 2004).

In a retrospective study, Rosenberg et al. (2006) found that the implantable Doppler probe is a sensitive method for postoperative monitoring of free flaps but had a false-positive rate of 88%, which resulted in a high proportion of subsequent negative surgical explorations. Twenty cases were in this study including one breast reconstruction using an anterolateral thigh-free flap which involved monitoring of the internal mammary vein.

### **Reconstruction of the Nipple-Areolar Complex**

This portion of the breast reconstruction is usually performed as a second or third stage after the breast mound has been constructed. The recreation of the nipple-areolar complex involves skin grafts, small flaps, and tattooing and/or transplantation of nipple-areolar tissue from the opposite breast. Within 12 months, most reconstructed nipples undergo a 50% reduction in projection. Therefore, the nipple should be made larger than desired during the initial surgery. The rebuilding of the nipple-areolar area is conducted first, and the tattooing procedure is done when swelling has subsided, usually 3–6 weeks after nipple creation (Diana, et al., 2006; Wilhelmi and Phillips, 2004).

### **Contralateral Breast**

Although the goal of breast reconstruction is to restore symmetry, the process may leave the opposite or contralateral breast larger or smaller than the surgical breast. To correct this asymmetry, a mastopexy or reduction mammoplasty may be performed on the contralateral breast. If the reconstructed breast is larger, then an augmentation mammoplasty with implant may be performed on the nondiseased breast (Wilhelmi and Phillips, 2004).

### **Federal Mandate**

The Women's Health and Cancer Rights Act of 1997 (WHCRA) was enacted as a federal mandate in October 1998. The federal mandate defines coverage for breast reconstruction following mastectomy as:

- reconstruction of the breast on which the mastectomy was performed
- surgery and reconstruction on the other breast to produce symmetrical appearance
- prostheses and treatment of physical complications in all stages of mastectomy, including lymphedemas

The mandate prohibits any limitations to the number of prostheses or the length of time from the date of the mastectomy.

### **Summary**

Restoration of a normal breast form through breast reconstruction is performed for patients undergoing mastectomy or lumpectomy. The manner of breast reconstruction is an individualized decision between the patient and their physician.

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## **Coding/Billing Information**

**Note:** This list of codes may not be all-inclusive.

**When medically necessary:**

<b>CPT®*</b> <b>Codes</b>	<b>Description</b>
11920	Tattooing, intradermal introduction of insoluble opaque pigments to correct color defects of skin, including micropigmentation; 6.0cm <sup>2</sup> or less
11921	Tattooing, intradermal introduction of insoluble opaque pigments to correct color defects of skin, including micropigmentation; 6.120.0cm <sup>2</sup>
11970	Replacement of tissue expander with permanent prosthesis
11971	Removal of tissue expander(s) without insertion of prosthesis

13100	Repair, complex, trunk; 1.1– 2.5cm
13101	Repair, complex, trunk; 2.6– 7.5cm
13102	Repair, complex, trunk; each additional 5cm or less (list separately in addition to code for primary procedure)
19316	Mastopexy
19318	Reduction mammoplasty
19324	Mammoplasty, augmentation; without prosthetic implant
19325	Mammoplasty, augmentation; with prosthetic implant
19328	Removal of intact mammary implant
19330	Removal of mammary implant material
19340	Immediate insertion of breast prosthesis following mastopexy, mastectomy or in reconstruction
19342	Delayed insertion of breast prosthesis following mastopexy, mastectomy or in reconstruction
19350	Nipple/areola reconstruction
19357	Breast reconstruction, immediate or delayed, with tissue expander, including subsequent expansion
19361	Breast reconstruction with latissimus dorsi flap, with or without prosthetic implant
19364	Breast reconstruction with free flap
19366	Breast reconstruction with other technique
19367	Breast reconstruction with transverse rectus abdominis myocutaneous flap (TRAM), single pedicle, including closure of donor site
19368	Breast reconstruction with transverse rectus abdominis myocutaneous flap (TRAM), single pedicle, including closure of donor site; with microvascular anastomosis (supercharging)
19369	Breast reconstruction with transverse rectus abdominis myocutaneous flap (TRAM), double pedicle, including closure of donor site
19370	Open periprosthetic capsulotomy, breast
19371	Periprosthetic capsulectomy, breast
19380	Revision of reconstructed breast

<b>HCPCS Codes</b>	<b>Description</b>
L8600	Implantable breast prosthesis, silicone or equal

<b>ICD-9-CM Diagnosis Codes</b>	<b>Description</b>
174.0–174.9	Malignant neoplasm of female breast
175.0–175.9	Malignant neoplasm of male breast
198.81	Secondary malignant neoplasm of other specified sites; breast
232.5	Carcinoma in situ of skin of trunk, except scrotum
233.0	Carcinoma in situ of breast
996.52	Mechanical complication of other specified prosthetic device, implant, and graft; due to graft of other tissue, not elsewhere classified
996.54	Mechanical complication of other specified prosthetic device, implant, and graft; due to breast prosthesis
996.69	Infection and inflammatory reaction due to internal prosthetic device, implant, and graft; due to other internal prosthetic device, implant, and graft
996.79	Other complications of internal (biological) (synthetic) prosthetic device, implant, and graft; due to other internal prosthetic device, implant, and graft
V10.3	Personal history of malignant neoplasm; breast
V45.71	Acquired absence of breast
V50.41	Prophylactic organ removal: breast
V51	Aftercare involving plastic surgery
V52.4	Fitting and adjustment of breast prosthesis and implant

## References

1. Alderman AK, Kuzon WM Jr, Wilkins EG. A two-year prospective analysis of trunk function in TRAM breast reconstructions. *Plast Reconstr Surg.* 2006 Jun;117(7):2131–8.
2. American Cancer Society: Breast reconstruction after mastectomy. Updated Sept. 21, 2006. Accessed January 2007. Available at URL address: <http://www.cancer.org>
3. American Society of Plastic Surgeons: Breast reconstruction following breast removal. Accessed January 2007. Available at URL address: [http://www.plasticsurgery.org/public\\_education/procedures/BreastReconstruction.cfm](http://www.plasticsurgery.org/public_education/procedures/BreastReconstruction.cfm)
4. Antoniuk PM. Breast reconstruction. *Obstet Gynecol Clin North Am.* 2002 Mar;29(1):209–23.
5. Bajaj AK, Chevray PM, Chang DW. Comparison of donor-site complications and functional outcomes in free muscle-sparing TRAM flap and free DIEP flap breast reconstruction. *Plast Reconstr Surg.* 2006 Mar;117(3):737–46; discussion 747–50.
6. Behnam AB, Nguyen D, Moran SL, Serletti JM. TRAM flap breast reconstruction for patients with advanced breast disease. *Ann Plast Surg.* 2003 Jun;50(6):567–71.
7. Burns JL, Blackwell SJ. Plastic Surgery. In: Townsend CM, Beauchamp RD, Evers BM, Mattox KL, editors. *Sabiston Textbook of Surgery. The Biological Basis of Modern Surgical Practice.* 17<sup>th</sup> ed. St. Louis, MO: W.B. Saunders Company; 2004. Ch.72.
8. Carlson GW, Styblo TM, Lyles RH, Jones G, Murray DR, Staley CA, Wood WC. The use of skin sparing mastectomy in the treatment of breast cancer: The Emory experience. *Surgical Oncology.* 2003 Dec;12(4):265–9.
9. Centers for Medicare & Medicaid Services (CMS). The Women's Health and Cancer Rights Act. Updated Dec 14, 2005. Accessed January 2007. Available at URL address: <http://www.cms.hhs.gov/HealthInsReformforConsume/>
10. Chevray PM. Breast reconstruction with superficial inferior epigastric artery flaps: a prospective comparison with TRAM and DIEP flaps. *Plast Reconstr Surg.* 2004 Oct;114(5):1077–83; discussion 1084–5.
11. Cordeiro PG, Pusic AL, Disa JJ, McCormick B, VanZee K. Irradiation after immediate tissue expander/implant breast reconstruction: outcomes, complications, aesthetic results, and satisfaction among 156 patients. *Plast Reconstr Surg.* 2004 Mar;113(3):877–81.
12. DellaCroce FJ, Sullivan SK. Application and refinement of the superior gluteal artery perforator free flap for bilateral simultaneous breast reconstruction. *Plast Reconstr Surg.* 2005 Jul;116(1):97–103; discussion 104–5.
13. Deutsch MF, Robb GL, Talavera F, Shenaq SM, Slenkovich N, Aly A. Breast Reconstruction, Other Free Flaps. Updated 2005 June. Accessed January 2007. Available at URL address: <http://www.emedicine.com/plastic/topic140.htm>
14. Deutsch MF, Robb GL, Talavera F, Shenaq SM, Slenkovich N, Aly A. Breast Reconstruction, Refinements & Finishing Touches. Updated 2005 June. Accessed January 2007. Available at URL address: <http://www.emedicine.com/plastic/topic135.htm>

15. Diana M, Robb GL, Talavera F, Shenaq SM, Slenkovich N. Breast Reconstruction, Nipple-Areola Reconstruction. Updated June 2006. Accessed January 2007. Available at URL address: <http://www.emedicine.com/plastic/topic144.htm>
16. Draper LB, Bui DT, Chiu ES, Mehrara BJ, Pusic AL, Cordeiro PG, Disa JJ. Nipple-Areola Reconstruction Following Chest-Wall Irradiation for Breast Cancer: Is It Safe? *Ann Plast Surg.* 2005 Jul;55(1):12–15.
17. Foster RD, Esserman LJ, Anthony JP, Hwang ES, Do H. Skin-sparing mastectomy and immediate breast reconstruction: prospective cohort study for the treatment of advanced stages of breast carcinoma. *Ann Surg Oncol.* 2002 Jun;9(5):462–6.
18. Fulda GJ, Khan SU, Zabel DD. Special issues in plastic and reconstructive surgery. *Crit Care Clin.* 2003 Jan;19(1):91–108, vi.
19. Gabbay JS, Eby JB, Kulber DA. The midabdominal TRAM flap for breast reconstruction in morbidly obese patients. *Plast Reconstr Surg.* 2005 Mar;115(3):764–70.
20. Garvey PB, Buchel EW, Pockaj BA, Casey WJ 3rd, Gray RJ, Hernandez JL, Samson TD. DIEP and pedicled TRAM flaps: a comparison of outcomes. *Plast Reconstr Surg.* 2006 May;117(6):1711–9; discussion 1720–1.
21. Goodwin SJ, McCarthy CM, Pusic AL, Bui D, Howard M, Disa JJ, Cordeiro PG, Mehrara BJ. Complications in smokers after postmastectomy tissue expander/implant breast reconstruction. *Ann Plast Surg.* 2005 Jul;55(1):16–20.
22. Hwang TG, Wilkins EG, Lowery JC, Gentile J. Implementation and evaluation of a clinical pathway for TRAM breast reconstruction. *Plastic and Reconstructive Surgery.* 2000;105(2):541–8.
23. Kroll SS. Fat necrosis in free transverse rectus abdominis myocutaneous and deep inferior epigastric perforator flaps. *Plast Reconstr Surg.* 2000 Sep;106(3):576–83.
24. Losken A, Carolson GW, Bostwick J III, Jones GE, Culbertson JH, Schoemann M. Trends in unilateral breast reconstruction and management of the contralateral breast: the Emory experience. *Plast Reconstr Surg.* 2002 Jul;110(1):89–97.
25. Losken A, Carolson GW, Schoemann MB, Jones GE, Culbertson JH, Hester TR. Factors that influence the completion of breast reconstruction. *Ann Plast Surg.* 2004 Mar;52(3):258–61.
26. National Comprehensive Cancer Network. Breast cancer treatment. Accessed January 2007. Available at URL address: [http://www.nccn.org/patients/patient\\_gls/\\_english/\\_breast/5\\_treatment.asp](http://www.nccn.org/patients/patient_gls/_english/_breast/5_treatment.asp)
27. National Library of Medicine. Breast Reconstruction. Updated Dec. 14, 2006. Accessed January 2007. Available at URL address: <http://www.nlm.nih.gov/medlineplus/breastreconstruction.html>
28. Petrek JA, Disa JJ. Section 3: Rehabilitation after Treatment for Cancer of the Breast. In: DeVita VT, Hellman S, Rosenberg SA, editors. *Cancer: Principles & Practices of Oncology.* 7<sup>th</sup> ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2005. Ch 33.
29. Rosenberg JJ, Fornage BD, Chevray PM. Monitoring buried free flaps: limitations of the implantable Doppler and use of color duplex sonography as a confirmatory test. *Plast Reconstr Surg.* 2006 Jul;118(1):109–13; discussion 114–5.
30. Rowland JH, Desmond KA, Meyerowitz BE, Belin TR, Wyatt GE, Ganz PA. Role of breast reconstructive surgery in physical and emotional outcomes among breast cancer survivors. *Journal of National Cancer Institute.* 2000 Sep;92(17):1422–9.

31. Shenaq SM, Bullocks J, Kim J, Robb GL, Armenta A. Breast Reconstruction, Latissimus Flap. Updated June 2006. Accessed January 2007. Available at URL address: <http://www.emedicine.com/plastic/topic137.htm>
32. Spear SL, Ducic I, Low M, Cuoco F. The effect of radiation on pedicled TRAM flap breast reconstruction: outcomes and implications. *Plast Reconstr Surg.* 2005 Jan;115(1):84–95.
33. Sukumvanich P, Borgen P. Benign Diseases of the Breast. Mastectomy. In: Rakel RE, Bope ET, editors. *Conn's Current Therapy 2006.* 58<sup>th</sup> ed. St Louis, MO. W.B. Saunders, Co.; 2006. pg 1279.
34. U.S. Food and Drug Administration (FDA). Breast implants home page. Breast Implants Questions and Answers (2006). Updated November 17, 2006a. Accessed January 2007. Available at URL address: <http://www.fda.gov/cdrh/breastimplants/qa2006.html#21>
35. U.S. Food and Drug Administration (FDA). Labeling for Approved Breast Implants. Updated November 17, 2006b. Accessed January 2007. Available at URL address: <http://www.fda.gov/cdrh/breastimplants/labeling.html>
36. U.S. Food and Drug Administration (FDA). Center for Devices and Radiological Health. Mentor MemoryGel™ Silicone Gel-Filled Breast Implants (P030053). Updated November 17, 2006c. Accessed January 2007. Available at URL address: <http://www.fda.gov/cdrh/pdf3/p030053.html>
37. U.S. Food and Drug Administration (FDA). Center for Devices and Radiological Health. Inamed® Silicone-Filled Breast Implants (P020056). Updated November 17, 2006d. Accessed January 2007. Available at URL address: <http://www.fda.gov/cdrh/pdf2/p020056.html>
38. Wilhelmi BJ and Phillips LG. Breast Reconstruction. In: Townsend CM, Beauchamp RD, Evers BM, Mattox KL, editors. *Sabiston Textbook of Surgery. The Biological Basis of Modern Surgical Practice.* 17<sup>th</sup> ed. St. Louis, MO: W.B. Saunders Company; 2004. Ch.33.
39. Zenn MR, Robb GL, Talavera F, Shenaq SM, Slenkovich N, Aly A. Breast Reconstruction: TRAM, Bipedicled. Updated 2005 May. Accessed January 2007. Available at URL address: <http://www.emedicine.com/plastic/topic133.htm>
40. Zenn MR, Robb GL, Talavera F, Shenaq SM, Slenkovich N, Aly A. Breast Reconstruction: TRAM, Free. Updated 2005 May. Accessed January 2007. Available at URL address: <http://www.emedicine.com/plastic/topic136.htm>
41. Zenn MR, Robb GL, Talavera F, Shenaq SM, Slenkovich N, Aly A. Breast Reconstruction: TRAM, Unipedicled. Updated May 2005. Accessed January 2007. Available at URL address: <http://www.emedicine.com/plastic/topic141.htm>
42. Zion SM, Slezak JM, Sellers TA, Woods JE, Arnold PG, Petty PM, et al. Reoperations after prophylactic mastectomy with or without implant reconstruction. *Cancer.* 2003;98(10):2152–60.