

## Preventive Mastectomy: Questions and Answers

### Key Points

- Preventive mastectomy (also called prophylactic or risk-reducing mastectomy) is the surgical removal of one or both breasts. It is done to prevent or reduce the risk of breast cancer in women who are at high risk of developing the disease (see Questions 1 and 2).
- Existing data suggest that preventive mastectomy may significantly reduce (by about 90 percent) the chance of developing breast cancer in moderate- and high-risk women (see Question 3).
- It is important for a woman who is considering preventive mastectomy to talk with a doctor about her risk of developing breast cancer, the surgical procedure and its potential complications, and alternatives to surgery (see Questions 2, 4, and 5).
- Many women who choose to have preventive mastectomy also decide to have breast reconstruction to restore the shape of the breast (see Question 6).

### 1. **What is preventive mastectomy, and what types of procedures are used in preventive mastectomy?**

Preventive mastectomy (also called prophylactic or risk-reducing mastectomy) is the surgical removal of one or both breasts in an effort to prevent or reduce the risk of breast cancer (1). Preventive mastectomy involves one of two basic procedures: total mastectomy and subcutaneous mastectomy. In a total mastectomy, the doctor removes the entire breast and nipple. In a subcutaneous mastectomy, the doctor removes the breast tissue but leaves the nipple intact. Doctors most often recommend a total mastectomy because it removes more tissue than a subcutaneous mastectomy. A total mastectomy provides the greatest protection against cancer developing in any remaining breast tissue.



## 2. Why would a woman consider undergoing preventive mastectomy?

Women who are at high risk of developing breast cancer may consider preventive mastectomy as a way of decreasing their risk of this disease. Some of the factors that increase a woman's chance of developing breast cancer include the following (2, 3, 4, 5, 6):

- **Previous breast cancer**—A woman who has had cancer in one breast is more likely to develop a new cancer in the opposite breast. Occasionally, such women may consider preventive mastectomy to decrease the chance of developing a new breast cancer.
- **Family history of breast cancer**—Preventive mastectomy may be an option for a woman whose mother, sister, or daughter had breast cancer, especially if they were diagnosed before age 50. If multiple family members have breast or ovarian cancer, then a woman's risk of breast cancer may be even higher.
- **Breast cancer-causing gene alteration**—A woman who tests positive for changes, or mutations, in certain genes that increase the risk of breast cancer (such as the *BRCA1* or *BRCA2* gene) may consider preventive mastectomy.
- **Lobular carcinoma in situ**—Preventive mastectomy is sometimes considered for a woman with lobular carcinoma in situ, a condition that increases the risk of developing breast cancer in either breast.
- **Diffuse and indeterminate breast microcalcifications or dense breasts**—Rarely, preventive mastectomy may be considered for a woman who has diffuse and indeterminate breast microcalcifications (tiny deposits of calcium in the breast) or for a woman whose breast tissue is very dense. Dense breast tissue is linked to an increased risk of breast cancer and also makes diagnosing breast abnormalities difficult. Multiple biopsies, which may be necessary for diagnosing abnormalities in dense breasts, cause scarring and further complicate examination of the breast tissue, by both physical examination and mammography.
- **Radiation therapy**—A woman who had radiation therapy to the chest (including the breasts) before age 30 is at an increased risk of developing breast cancer throughout her life. This includes women treated for Hodgkin's lymphoma.

It is important for a woman who is considering preventive mastectomy to talk with a doctor about her risk of developing breast cancer (with or without a mastectomy), the surgical procedure, and potential complications. All women are different, so preventive mastectomy should be considered in the context of each woman's unique risk factors and her level of concern.

**3. How effective is preventive mastectomy in preventing or reducing the risk of breast cancer?**

Existing data suggest that preventive mastectomy may significantly reduce (by about 90 percent) the chance of developing breast cancer in moderate- and high-risk women (2, 6, 7). However, no one can be certain that this procedure will protect an individual woman from breast cancer. Breast tissue is widely distributed on the chest wall, and can sometimes be found in the armpit, above the collarbone, and as far down as the abdomen. Because it is impossible for a surgeon to remove all breast tissue, breast cancer can still develop in the small amount of remaining tissue.

**4. What are the possible drawbacks of preventive mastectomy?**

Like any other surgery, complications such as bleeding or infection can occur (1). Preventive mastectomy is irreversible and can have psychological effects on a woman due to a change in body image and loss of normal breast functions (3, 4, 5, 7, 8, 9). A woman should discuss her feelings about mastectomy, as well as alternatives to surgery, with her health care providers. Some women obtain a second medical opinion to help with the decision.

**5. What alternatives to surgery exist for preventing or reducing the risk of breast cancer?**

Doctors do not always agree on the most effective way to manage the care of women who have a strong family history of breast cancer and/or have other risk factors for the disease. Some doctors may advise very close monitoring (periodic mammograms, regular checkups that include a clinical breast examination performed by a health care professional, and monthly breast self-examinations) to increase the chance of detecting breast cancer at an early stage (2, 4). Some doctors may recommend preventive mastectomy, while others may prescribe tamoxifen or raloxifene, medications that have been shown to decrease the chances of getting breast cancer in women at high risk of the disease (2, 4, 8, 10, 11). (More information about tamoxifen and raloxifene is available in the National Cancer Institute's (NCI) fact sheets, *Tamoxifen: Questions and Answers*, which can be found at <http://www.cancer.gov/cancertopics/factsheet/Therapy/tamoxifen> on the Internet, and *The Study of Tamoxifen and Raloxifene (STAR): Questions and Answers*, which can be found at <http://www.cancer.gov/newscenter/pressreleases/STARresultsQandA> on the Internet.)

Doctors may also encourage women at high risk to limit their consumption of alcohol, eat a low-fat diet, engage in regular exercise, and avoid menopausal hormone use (8). Although these lifestyle recommendations make sense and are part of an overall healthy way of living, we do not yet have clear and convincing proof that they specifically reduce the risk of developing breast cancer.

**6. What is breast reconstruction?**

Breast reconstruction is a plastic surgery procedure in which the shape of the breast is rebuilt. Many women who choose to have preventive mastectomy also decide to have breast reconstruction, either at the time of the mastectomy or at some later time.

Before performing breast reconstruction, the plastic surgeon carefully examines the breasts and discusses the reconstruction options. In one type of reconstructive procedure, the surgeon inserts an implant (a balloon-like device filled with saline or silicone) under the skin and the chest muscles. Another procedure, called tissue flap reconstruction, uses skin, fat, and muscle from the woman's abdomen, back, or buttocks to create the breast shape. The surgeon will discuss with the patient any limitations on exercise or arm motion that might result from these operations.

**7. What type of follow-up care is needed after reconstructive surgery?**

Women who have reconstructive surgery are monitored carefully to detect and treat complications, such as infection, movement of the implant, or contracture (the formation of a firm, fibrous shell or scar tissue around the implant caused by the body's reaction to the implant). Women who have tissue flap reconstruction may want to ask their surgeon about physical therapy, which can help them adjust to limitations in activity and exercise after surgery (12). Routine screening for breast cancer is also part of the postoperative follow-up, because the risk of cancer cannot be completely eliminated. When women with breast implants have mammograms, they should tell the radiology technician about the implant. Special procedures may be necessary to improve the accuracy of the mammogram and to avoid damaging the implant. However, women who have had reconstructive surgery on both breasts should ask their doctors whether mammograms are still necessary. (More information about mammograms can be found in the NCI fact sheet, *Screening Mammograms: Questions and Answers*, at <http://www.cancer.gov/cancertopics/factsheet/Detection/screening-mammograms> on the Internet.)

**8. Where can a person find more information about breast implants?**

The U.S. Food and Drug Administration (FDA) regulates the use of breast implants and can supply detailed information about these devices. To listen to recorded information or request free printed material on breast implants, consumers can contact the FDA Center for Devices and Radiological Health (CDRH) at:

**Address:** Consumer Staff  
CDRH/FDA  
HFZ-210  
1350 Piccard Drive  
Rockville, MD 20850

**Telephone:** 1-888-INFO-FDA (1-888-463-6332), toll-free  
301-827-3990  
(Call between 8:00 a.m. and 4:30 p.m., Eastern Standard Time, for either number.)

**E-mail:** dsma@cdrh.fda.gov

**Web site:** <http://www.fda.gov/cdrh/consumer/index.html>  
<http://www.fda.gov/cdrh/breastimplants>  
(Breast Implants Home Page)

### Selected References

1. Singletary SE. Techniques in surgery: Therapeutic and prophylactic mastectomy. In: Harris JR, Lippman ME, Morrow M, Osborn CK, editors. *Diseases of the Breast*. 3<sup>rd</sup> ed. Philadelphia: Lippincott Williams and Wilkins, 2004.
2. Sherry RM. Cancer prevention: Role of surgery in cancer prevention. In: DeVita VT Jr., Hellman S, Rosenberg SA, editors. *Cancer: Principles and Practice of Oncology*. Vol. 1 and 2. 6<sup>th</sup> ed. Philadelphia: Lippincott Williams and Wilkins, 2001.
3. Dickson RB, Lippman ME. Cancer of the breast. In: DeVita VT Jr., Hellman S, Rosenberg SA, editors. *Cancer: Principles and Practice of Oncology*. Vol. 1 and 2. 6<sup>th</sup> ed. Philadelphia: Lippincott Williams and Wilkins, 2001.
4. Sakorafas GH. Women at high risk for breast cancer: Preventive strategies. *The Mount Sinai Journal of Medicine* 2002; 69(4):264-266.
5. Taucher S, Gnant M, Jakesz R. Preventive mastectomy in patients at breast cancer risk due to genetic alterations in the BRCA1 and BRCA2 gene. *Langenbeck's Archives of Surgery* 2003; 388(1):3-8.
6. Anderson BO. Prophylactic surgery to reduce breast cancer risk: A brief literature review. *The Breast Journal* 2001; 7(5):321-330.
7. Hartmann LC, Schaid DJ, Woods JE, et al. Efficacy of bilateral prophylactic mastectomy in women with a family history of breast cancer. *The New England Journal of Medicine* 1999; 340(2):77-84.
8. Keefe KA, Meyskens FL Jr. Cancer prevention. In: Abeloff MD, Armitage JO, Lichter AS, Niederhuber JE, editors. *Clinical Oncology*. 2<sup>nd</sup> ed. London: Churchill Livingstone, 2000.

9. Levine DA, Gemignani ML. Prophylactic surgery in hereditary breast/ovarian cancer syndrome. *Oncology* 2003; 17(7):932–941.
10. Fisher B, Costantino JP, Wickerham DL, et al. Tamoxifen for the prevention of breast cancer: Current status of the National Surgical Adjuvant Breast and Bowel Project P-1 Study. *Journal of the National Cancer Institute* 2005; 97(22):1652–1662.
11. Vogel VG, Costantino JP, Wickerham DL, et al. Effects of tamoxifen vs raloxifene on the risk of developing invasive breast cancer and other disease outcomes: The NSABP Study of Tamoxifen and Raloxifene (STAR) P-2 Trial. *Journal of the American Medical Association* 2006; 295(23):2727–2741.
12. Monteiro M. Physical therapy implications following the TRAM procedure. *Physical Therapy* 1997; 77(7):765–770.

# # #

### **Related Resources**

#### **Publications (available at <http://www.cancer.gov/publications>)**

- National Cancer Institute Fact Sheet 3.62, *Genetic Testing for BRCA1 and BRCA2: It's Your Choice*
- National Cancer Institute Fact Sheet 5.6, *Probability of Breast Cancer in American Women*
- National Cancer Institute Fact Sheet 5.14, *Improving Methods for Breast Cancer Detection and Diagnosis*
- National Cancer Institute Fact Sheet 5.28, *Screening Mammograms: Questions and Answers*
- National Cancer Institute Fact Sheet 7.16, *Tamoxifen: Questions and Answers*
- National Cancer Institute Fact Sheet 7.47, *How To Find a Doctor or Treatment Facility If You Have Cancer*
- *What You Need To Know About™ Breast Cancer*

### **National Cancer Institute (NCI) Resources**

#### **Cancer Information Service (toll-free)**

Telephone: 1–800–4–CANCER (1–800–422–6237)

TTY: 1–800–332–8615

**Online**

NCI's Web site: <http://www.cancer.gov>

*LiveHelp*, NCI's live online assistance:

<https://cissecure.nci.nih.gov/livehelp/welcome.asp>

**This fact sheet was reviewed on 7/27/06**