



# Reconstructive Options in Breast Cancer

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# Objectives

Benefits

Pre-Operative Planning & Timing

Techniques

Post-Op Care

Outcomes

# Why Reconstruct?

“I have a long life to live and I want to live it whole.”

“I want to put on a nightgown again & fill it out & feel beautiful.”

“I was gardening one day when I bent over and my prosthesis fell out. Crying I picked it out of the muddy water. The next day I called a Plastic Surgeon.

# The Reconstructive Option- Introduction

Pt. Interest & Satisfaction Remains **HIGH**

Overall Referral Rate Remains **LOW**

Only **40 percent** of all patients undergoing a mastectomy undergo breast reconstruction.

Remains an **Underutilized Option**



# Benefits of Reconstruction

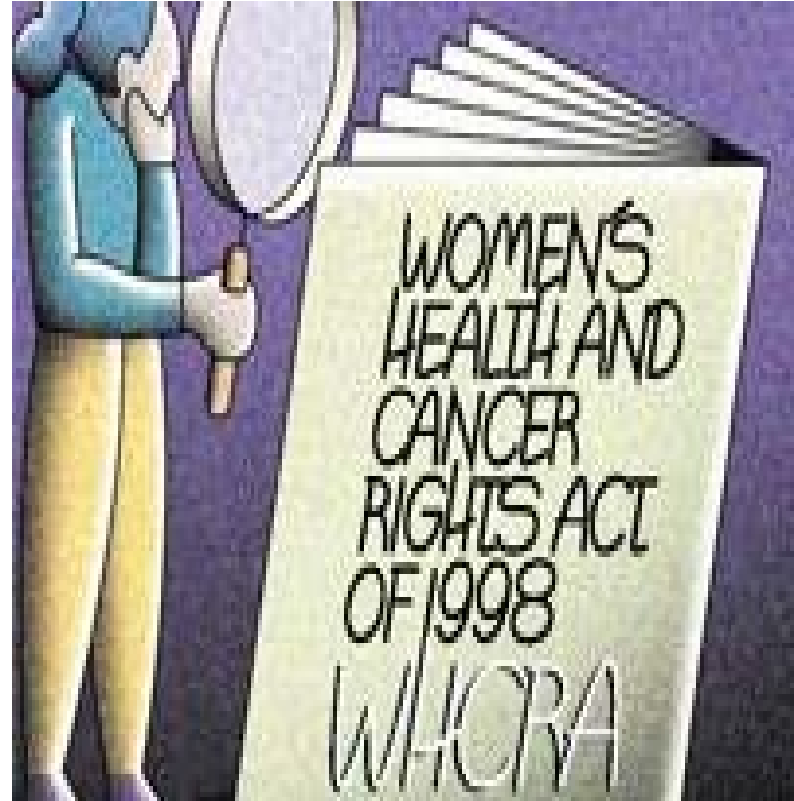
Improves:

Psychological State

Social Functioning

Emotional Health

Self-esteem: Sexuality &  
Body Image



# Breast Reconstruction Timing

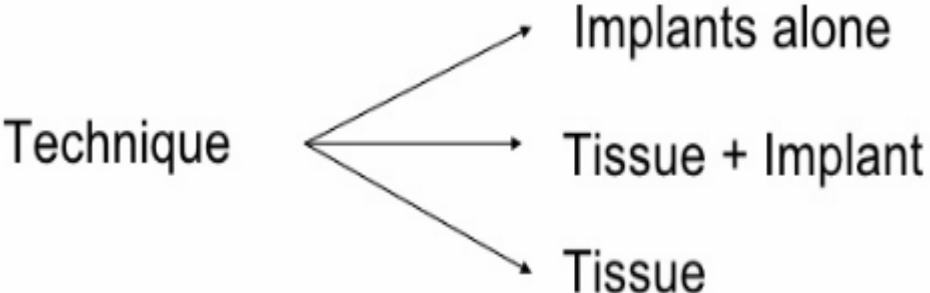
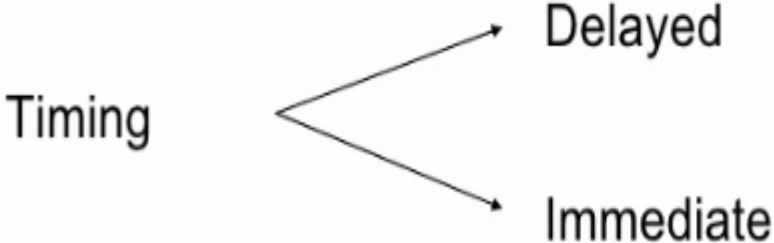
## Immediate

Expanders Placed at the time of the Mastectomy

Direct to implant

## Delayed:

Following mastectomy  
Expanders placed then stage 2 or 3.



# Types of Reconstruction

## Prosthetic:

Expander based Implant

Direct to Implant

## Autologous:

Perforator Flaps

TRAM

Latissimus Dorsi

Combination w/ Adjunct  
Procedures :

- Both Implant and Flap
- Nipple Reconstruction

Fat Grafting

BRAVA Device

Contralateral Mastopexy

# Important Considerations

Locally Advanced Dz Contraindications to immediate reconstruction.

Autogenous tissue reconstructions tolerate radiation better

Wait 2 to 3 months until chemotherapy has been completed for Delayed Recon.

Patients on Herceptin should have cardiac clearance prior to reconstruction.

Hold tamoxifen 2 weeks preop to avoid venous thromboembolism

Relative Contraindications to reconstruction include chronic medical conditions, such as COPD, CAD, severe asthma, fragile diabetes, extreme obesity, hypercoagulable and rheumatological disorders and the use of nicotine.



## Decisions, Decisions...

### Condition

### Best reconstruction option

- |                            |   |                                        |
|----------------------------|---|----------------------------------------|
| • Radiation                | ➡ | • Delayed autologous tissue            |
| • Bilateral reconstruction | ➡ | • Abdominal based recon – DIEP or SIEA |
| • Smoker                   | ➡ | • No abdominal based recon             |
| • Obesity (BMI>35)         | ➡ | • No abdominal based recon             |
| • Multiple medical issues  | ➡ | • Implant based recon                  |

# CANCER SURVEILLANCE

Current Evidence : Breast reconstruction does not impair cancer surveillance.

Recurrences occur:

1. A distant site
2. At the mastectomy skin.

Retrospective studies: NO increase in the risk of local failure. Annual oncologist visits.

Pts. w/ TRAM or perforator flap reconstruction can undergo annual mammography.

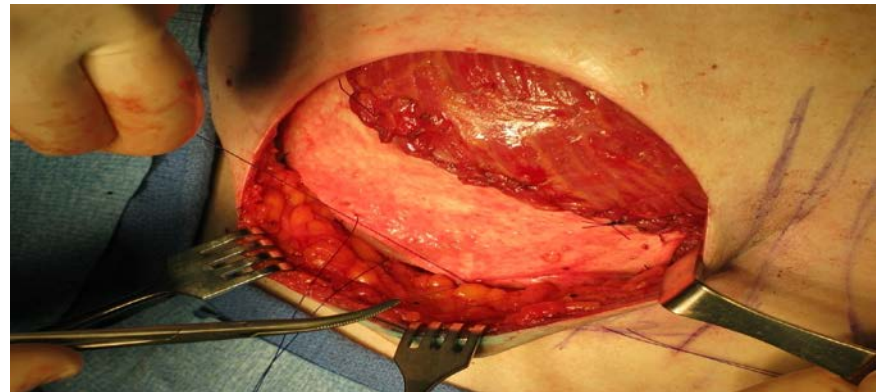


# Prosthetic Reconstruction

2009 ASPS study 86,424 women underwent breast Reconstruction.

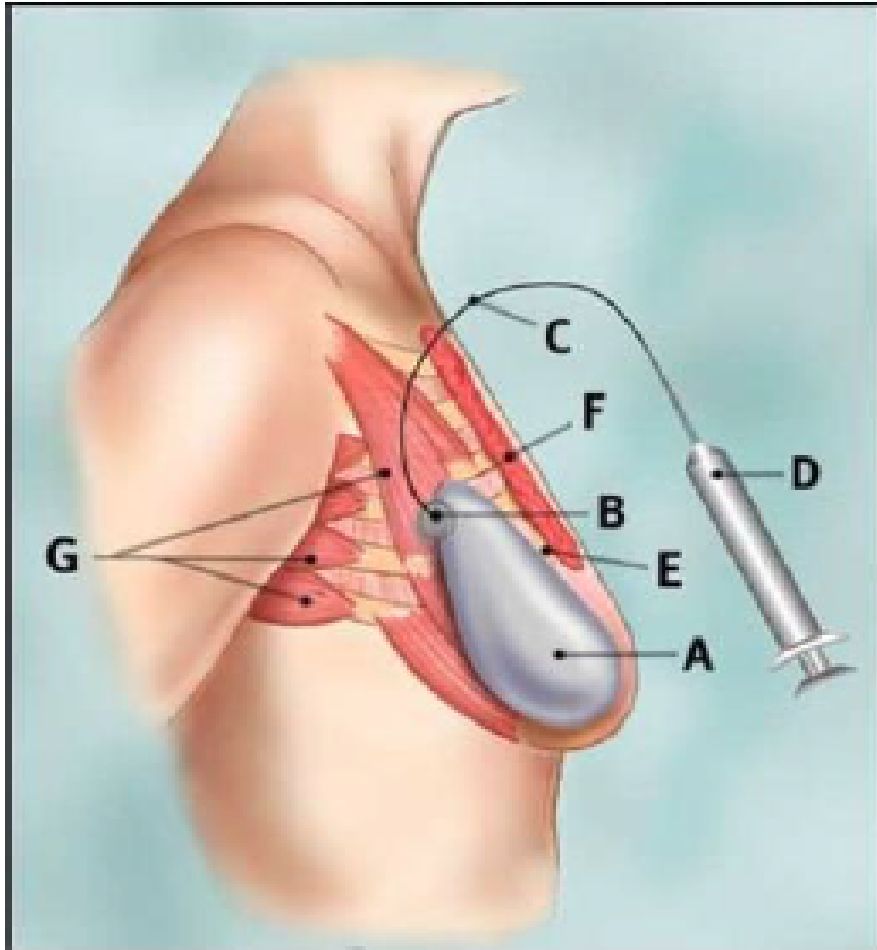
2/3 a total of 56,978 tissue expansion & implant based.

66% Female PRS reported that they would choose implant-based reconstruction for themselves if they had mastectomies.



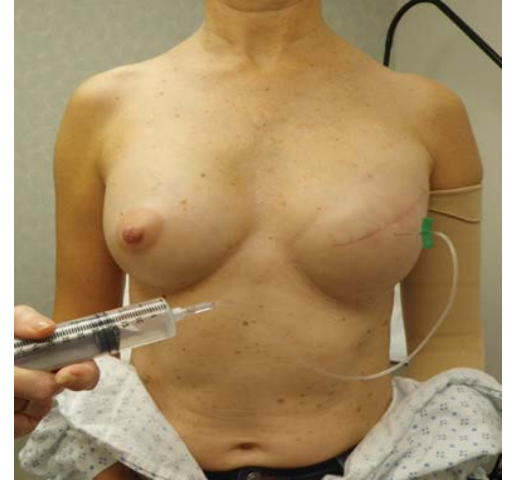
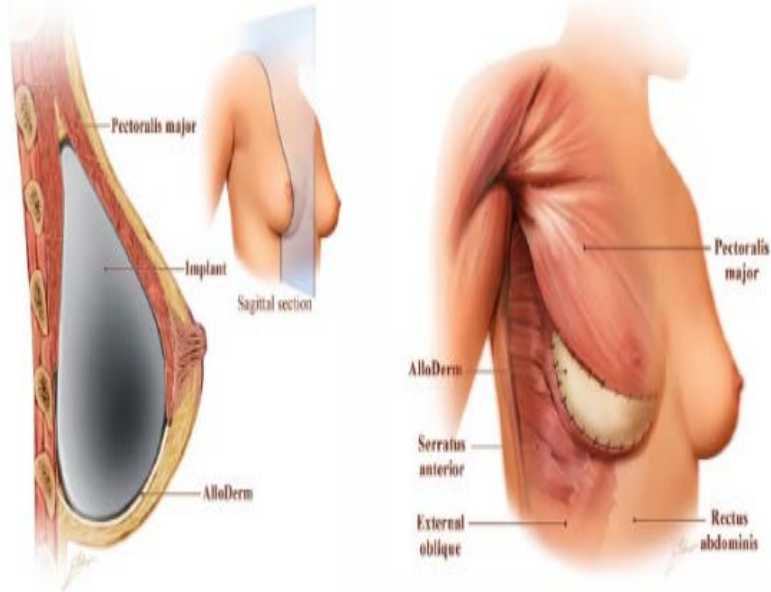
## Side view of breast area with filled tissue expander in place

- A. Tissue expander-filled
- B. Port
- C. Catheter
- D. Syringe
- E. Ribs
- F. Pectoralis major muscle
- G. Muscles of the chest wall



# Prosthetic Reconstruction

## Acellular Dermal Matrix (AlloDerm®)



# Autologous

- TRAM: Transverse Abdominis  
Myocutaneous Flap

Perforator Flaps

DIEP

SIEA

Free Tram

Latissimus Dorsi



# TRAM Flap

**TRAM Types:** Pedicled or Free Tram

**Tissue:** A skin, fascia and muscle flap.

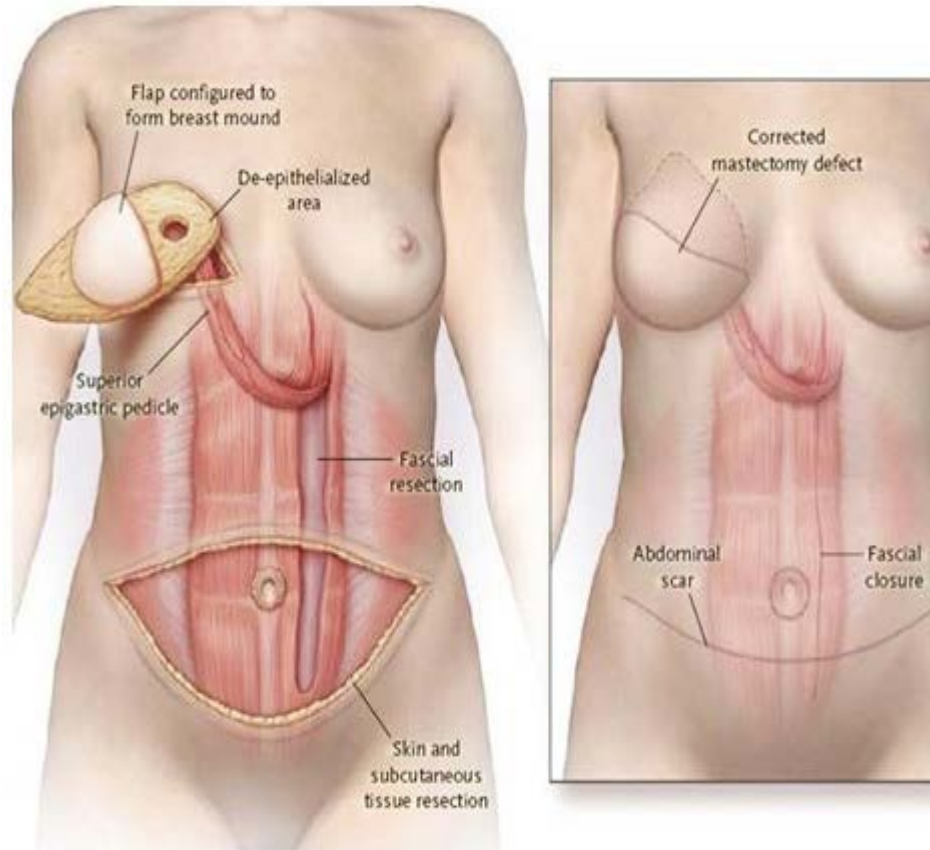
**Innervation:** Intercostal nerves, not typically harvested as a sensory flap.

**Blood supply:** The deep inferior epigastric artery and vein

**Artery:** Large caliber artery from 2 to 4 millimeters.

**Vein(s):** Paired

**Pedicle length:** This depends on muscle entry and the amount of intramuscular dissection



# Skin-sparing mastectomy w/ Immediate TRAM





# DIEP Flap

**Tissue:** Skin and fat from the lower abdominal wall.

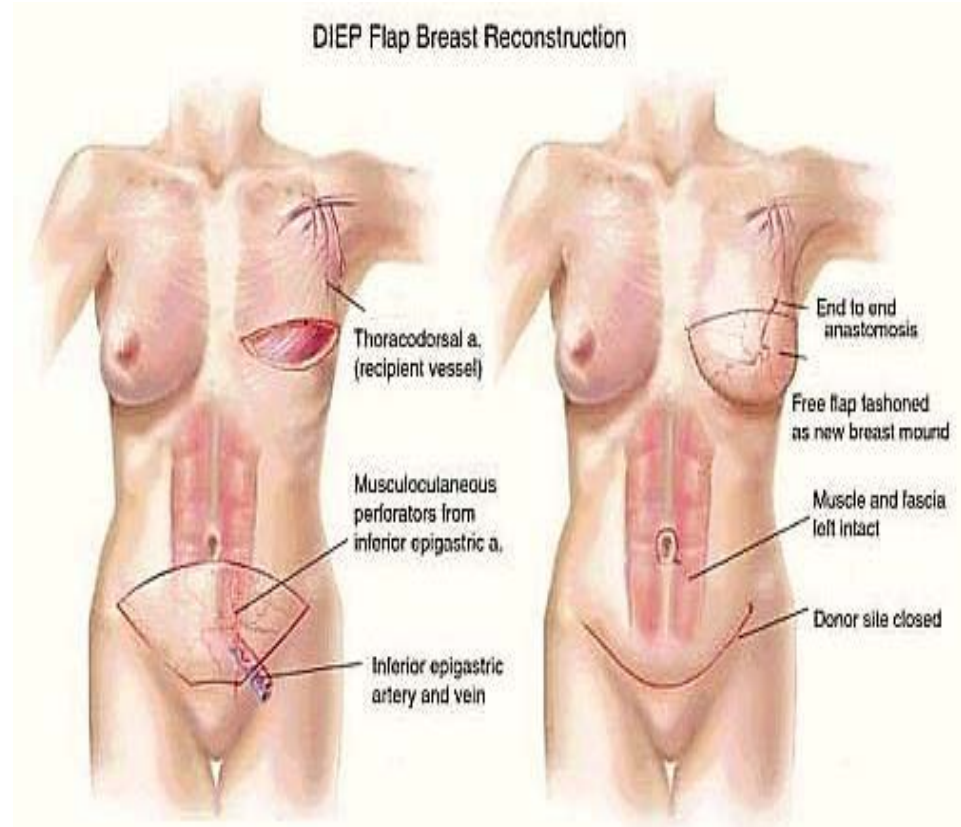
Zones 1, 2 and 3 are generally well perfused.

**Innervation:** Intercostal T11 and T12 dermatome via intercostal nerves.

**Blood supply:** The deep inferior epigastric artery and venae via perforators through the rectus muscle.

**Vein(s):** Paired

**Pedicle length:** From the perforator point to the origin on the external iliacs. Very Long



# Left Mastectomy w/ Free DIEP



# Latissimus Dorsi Flap

**Tissue:** Muscle flap. May be harvested with a skin paddle.

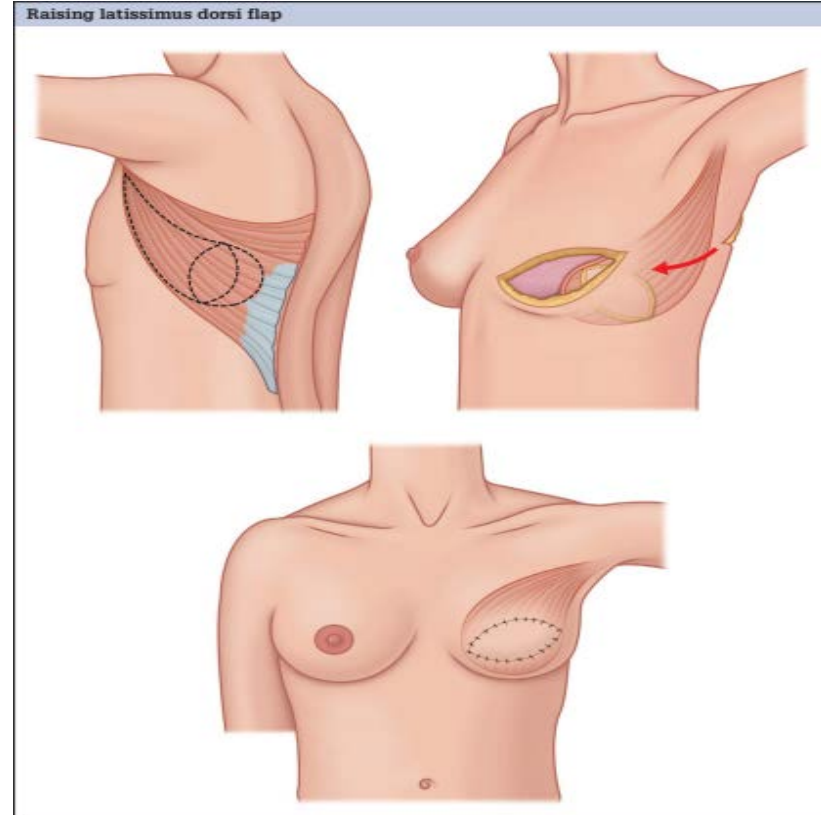
**Innervation:** The thoracodorsal nerve.

**Blood supply:** Thoracodorsal artery via the subscapular artery.

**Artery:** Can be up to 2 or 5 mm if harvested up to the subscapular artery.

**Vein(s):** Comparable to the artery. A single venae comitans.

**Pedicle length:** Approx. 15 cm



# Bilateral Latissimus



**A**



**B**



**C**



**D**

Why is alloderm used to create the inferior lateral implant pocket?

# Why is alloderm used to create the inferior lateral implant pocket?

Eliminates the need to elevate the serratus anterior fascia/musculature – it is hypothesized that this can decrease the pain and sensory morbidity experienced due to both the surgical disruption and postoperative expansion of the lateral intercostal nerves.

# Other Prosthetic Options

Direct to Implant:

Single Staged Procedure.

Avoids second operation.

Avoids Expander Use.

Good For Patients with previous  
implants or excellent tissue  
coverage.

# Autologous Time



**“Flappy  
Breast”**



## Flappy Breast - Name the Flap

This Flap Receives its blood supply from  
the Thoracodorsal Artery:

Flappy Breast - Name the Flap

Latissimus Dorsi Flap

# Flappy Breast - Name the Flap

The **pedicled** transverse rectus abdominis myocutaneous (TRAM) flap is based on the \_\_\_\_\_ vessels, and may be harvested as either a unipedicle or bipedicle flap.

Flappy Breast - Name the Flap

The Superior Epigastric Vessels

## Flappy Breast - Name the Flap

The free TRAM flap is based on  
the \_\_\_\_\_ vessels.

# Flappy Breast - Name the Flap

**inferior epigastric vessels**

This allows for a more direct and robust blood supply to the skin paddle.

# Flappy Breast - Name the Flap

The Most Common Cause of Flap Failure:

# Flappy Breast - Name the Flap

Early 24 hours Technical Error

Late >24 hours Thrombosis



# Combined & Adjunct Procedures

Necessary to improve:

Improves Symmetry

Reconstructs the nipple

Repairs contour abnormalities.

Techniques:

Nipple Reconstruction

Fat Grafting



(a)



(b)



(c)



(d)



(e)



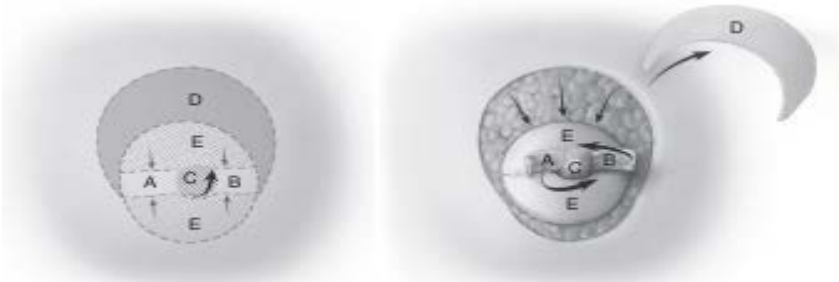
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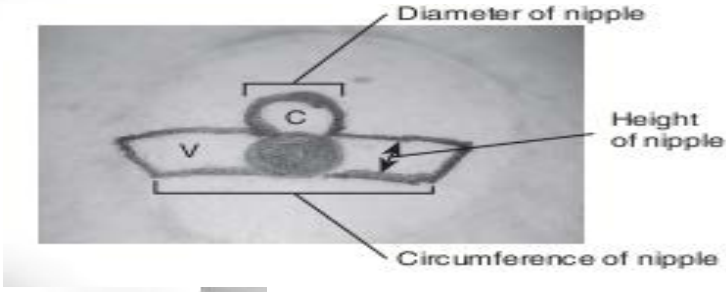
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# Nipple Reconstruction

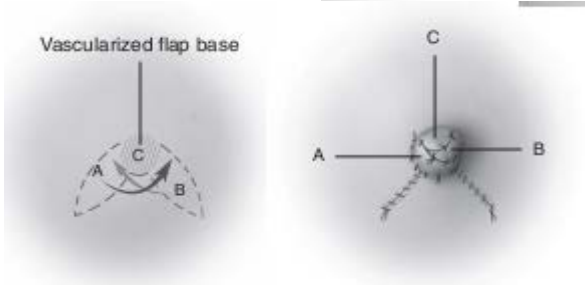
Skate Flap



C-V Flap



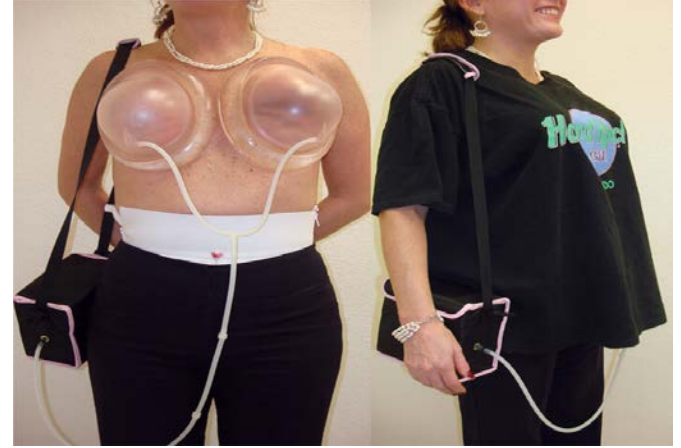
Fishtail-Modified C-V



# Fat Grafting



# BRAVA Device



# The Michigan Breast Reconstruction Outcome Study (MBROS)

## Distribution of Procedure Types and Timing\*

Procedure Timing	Implants		Pedicle TRAM Flaps		Free TRAM Flaps		Total
	No.	%	No.	%	No.	%	
Immediate	65	82.3	96	53.6	48	71.6	209
Delayed	14	17.7	83	46.4	19	28.4	116
Total	79	100.0	179	100.0	67	100.0	325

\* Does not include one patient who received both a free and a pedicle TRAM flap.

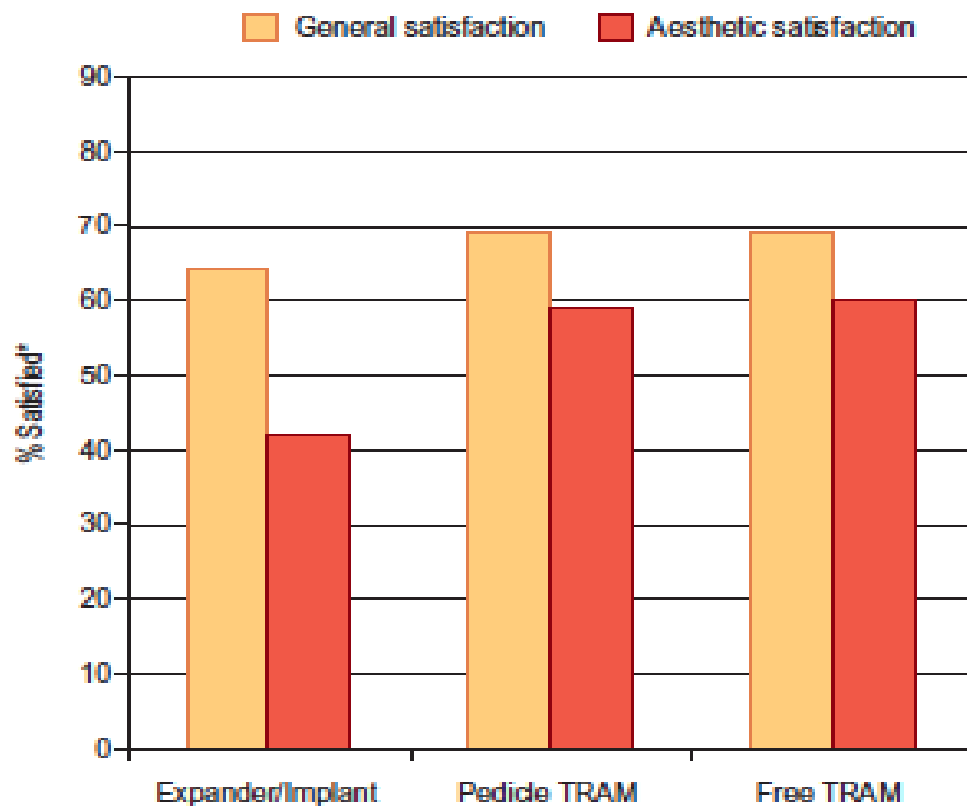
# The Michigan Breast Reconstruction Outcome Study (MBROS)

**Table 22.1** Frequency of complications at postoperative year 2, by type of reconstruction ( $n = 326$ )<sup>1</sup>

	Implants <i>n</i> (%)	Pedicle TRAMs <i>n</i> (%)	Free TRAMs <i>N</i> (%)
Back pain	1 (1.3)	4 (2.2)	4 (6.0)
Hernia/abdominal wall laxity	–	14 (7.8)	8 (11.9)
Lymphedema	3 (3.8)	10 (5.6)	3 (4.5)
Capsular contracture	12 (15.2)	–	–
Implant shift	1 (1.3)	–	–
Wound dehiscence	3 (3.8)	10 (5.6)	1 (1.5)
Partial flap loss (fat necrosis)	5 (6.3)	29 (16.2)	10 (14.9)
Total flap loss	0	2 (1.1)	1 (1.5)
Anastomotic thrombosis	–	–	4 (6.0)
Implant failure	3 (3.8)	–	–
Infection	28 (35.4)	21 (11.7)	12 (17.9)
<i>C. difficile</i> colitis	0	1 (0.5)	0
Hematoma/seroma breast	4 (5.1)	7 (3.9)	6 (9.0)
Hematoma/seroma abdomen	–	7 (3.9)	3 (4.5)
Abdominal wall necrosis	–	3 (1.7)	0
Cardiac/pulmonary complications	1 (1.3)	6 (3.4)	6 (9.0)

Alderman AK, Wilkins E, Kim M and Lowery J. Complications in post-mastectomy breast reconstruction: two year results of the Michigan breast reconstruction outcome study. *Plast Reconstr Surg* 2002;109:2265-2274.

## Patient satisfaction by procedure type at year two



\* Responded "very satisfied" or "satisfied" for all questions within the two subscales

## SURGICAL OUTCOMES

**Table 22.3** A comparison of patient satisfaction by procedure type and body-mass index at postoperative year 2<sup>3</sup>

	Normal	Overweight	Obese
<b>General satisfaction</b>			
Expander/implant	63%	53%	64%
Free and pedicle TRAM	76%	83%	70%
<b>Aesthetic satisfaction</b>			
Expander implant	55%	27%	13%
Free and pedicle TRAM	77%	69%	74%

*Atisha D, Alderman A, Wilkins E, et al. The Impact of Obesity on Patient Satisfaction with Breast Reconstruction. Plast Reconstr Surg 121(6):1893-1899, 2008.*