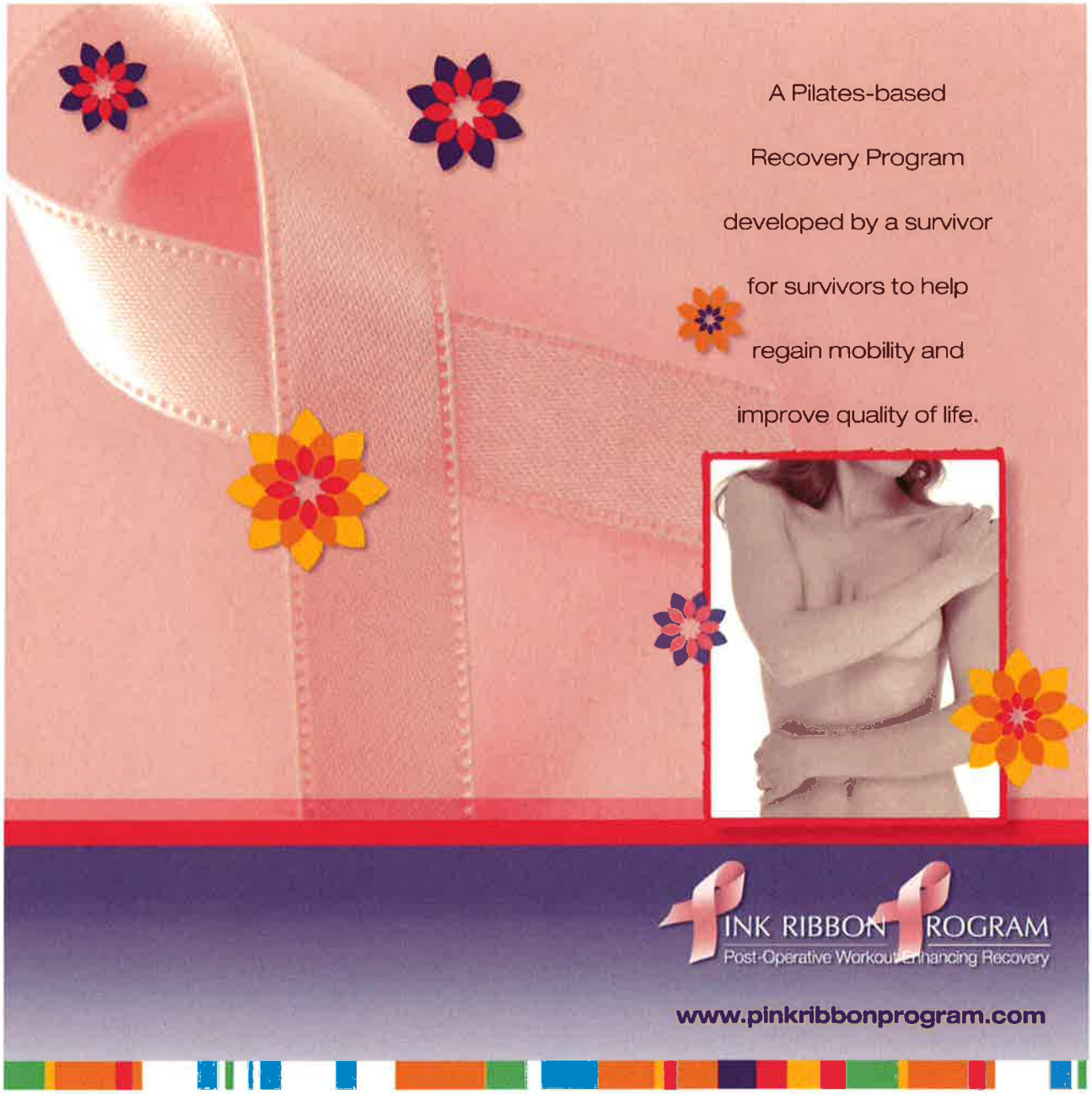


WORKSHOP STUDY GUIDE

Sample Course Materials

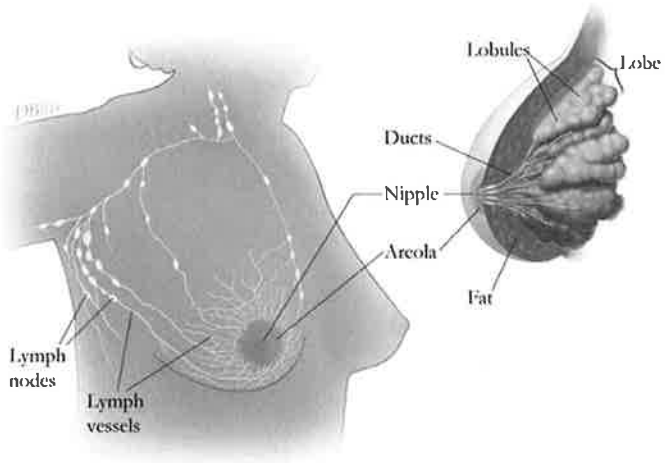
This is a Sample manual which is provided as a part of the course.

The pages shown are a random selection from this manual to give you a feel for the subject

matter on this course.

breast tissue. While it usually affects women, men can also get breast cancer (approx 1%).

II. Anatomy of the Breast



The breasts are bordered by the clavicle superiorly, the sternum medially, the lateral border of the latissimus muscle laterally, and the inframammary fold inferiorly. The breasts lie between the second and sixth ribs and are composed of tissue, skin, and subcutaneous fat.

A woman's breast is made up of **lobules** (glands that make breast milk), **ducts** (small tubes that connect lobules to the nipple), fatty and connective tissue, blood vessels, and lymph vessels. Most breast cancers begin in the ducts (ductal), some in the lobules (lobular), and the rest in other tissue.

Lymph vessels are like veins, except that they carry lymph fluid instead of blood. Lymph is clear fluid that contains immune system cells and waste products. Lymph vessels lead to small, bean-shaped collections of tissue called lymph nodes. Most lymph vessels of the breast lead to lymph nodes under the arm. These are called **axillary nodes**. If breast cancer cells reach the underarm lymph nodes and continue to grow, they cause the nodes to swell. Once cancer cells have reached these nodes they are more likely to spread to other organs of the body.

Fibrous bands, known as Cooper suspensory ligaments (*These are dense strands of fascia found throughout the entire breast which end on the skin itself)* divide the breast into 12-20 separate lobules of glandular tissue. Separate branching ducts drain each lobule. These ducts converge just beneath the nipple into sinuses that empty into a single terminal duct.

Breast tissue is enveloped by superficial pectoral fascia and deep pectoral fascia.

Several structures, including vessels and muscles with their nerve supply, are related to the breast and should be preserved during mastectomy or axillary node dissection.

The lateral pectoral nerve passes medially around the medial pectoralis minor, and the medial pectoral nerve passes laterally around the pectoralis minor. These nerves can be severed during surgery.
This results in numbness, motor atrophy, decreased sweat production in armpit and arm.

The medial pectoral nerve innervates pectoralis minor and the lateral portion of the pectoralis major muscles. Preservation of this nerve is particularly important to prevent atrophy of the pectoral muscles if submuscular implant reconstruction is planned.

The thoracodorsal nerve is identifiable medial to the thoracodorsal vein. Injury may result in a weakening of the latissimus.

The long thoracic nerve of Bell is located more medially in the axilla. It runs just beneath the fascia of the serratus anterior, medial to the thoracodorsal complex. Injury to this nerve will result in winging of the scapula.

Notes:

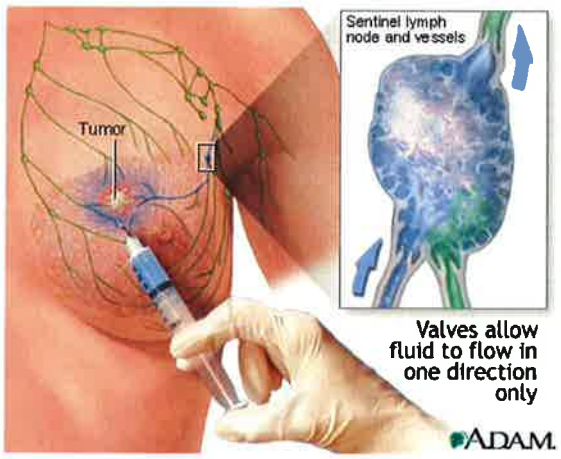
MUSCULATURE

Pectoralis Minor: tilts scapulae anteriorly, when scapula is stabilized, lifts chest and assists with forced inspiration.Origin – 3rd to 5th rib. Insertion – coracoid process of scapula.

Pectoralis Major: flexion, adduction, internal (medial) rotation. Origin – clavicle, sternum and first six costal cartilages. Insertion – greater tubercle of humerus.

IV. Surgery

A. Sentinel Node Biopsy – diagnostic procedure used to determine whether breast cancer has metastasized to axillary lymph nodes. The sentinel nodes are the first nodes that receive drainage from the tumors.



Notes:

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1. Requires the removal of only one to three axillary lymph nodes for close review by a pathologist.
2. If sentinel node does not contain cancer cells, then no additional nodes will need to be removed.
3. How it's done: before going into the operating room, surgeon injects a small dose of low-level radioactive tracer into the breast in the region of the patient's tumor. A blue dye is also injected to help visually track the location of the sentinel node. This node is the very first node to receive drainage from the cancer-containing area of the breast. Surgeon will wait 45 minutes to 8 hours after injection before operating. Surgeon then scans the area with a hand-held gamma ray counter to detect the radioactive tracer. Once this area has been pinpointed, surgeon will make a small incision and remove the sentinel nodes for a pathologist to examine under microscope.

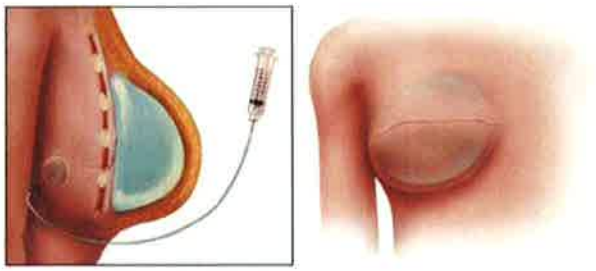
A. Autologous Techniques: derived from organisms of the same individual.
    1. Transverse Rectus Abdominis Myocutaneous Flap (TRAM Flap) Breast reconstruction using skin and fat from the abdomen carried on the rectus abdominis muscle.

In a pedicled TRAM flap procedure, the surgeon cuts a section of skin, muscle, fat and blood vessels from the abdomen, tunnels the tissue underneath the skin to its new location and uses it to form a new breast mound.

a. horizontal incision, shaped like an eye, from hip bone
   to hip bone.
b. once the rectus muscle is exposed, the fascia surrounding it, on either side, is cut open, the muscle is detached from the pubic bone.
c. The rectus abdominus muscle is supplied by the intercostal nerves, which are made up of the ventral rami of thoracic nerves T7-T11. The lateral neurovascular bundles are transected up to the 8th intercostal nerve, at the lateral border of the 8th rib. This will prevent the muscle from retaining contractile qualities after surgery which would cause pain and bulging in the epigastrium.
d. blood supply is cutoff from the lower portion of the muscle. Blood supply to the upper potion of the muscle is maintained.
e. the rectus abdominis is incised superiorly, on both the lateral and medial edges, up to the level of the costal margin.
f. the flap is flipped from its position (in the abdomen) to
   the breast area. This is achieved by the surgeon creating a tunnel from the abdomen to the chest.
g. where the muscle flap attaches to the ribs, it is

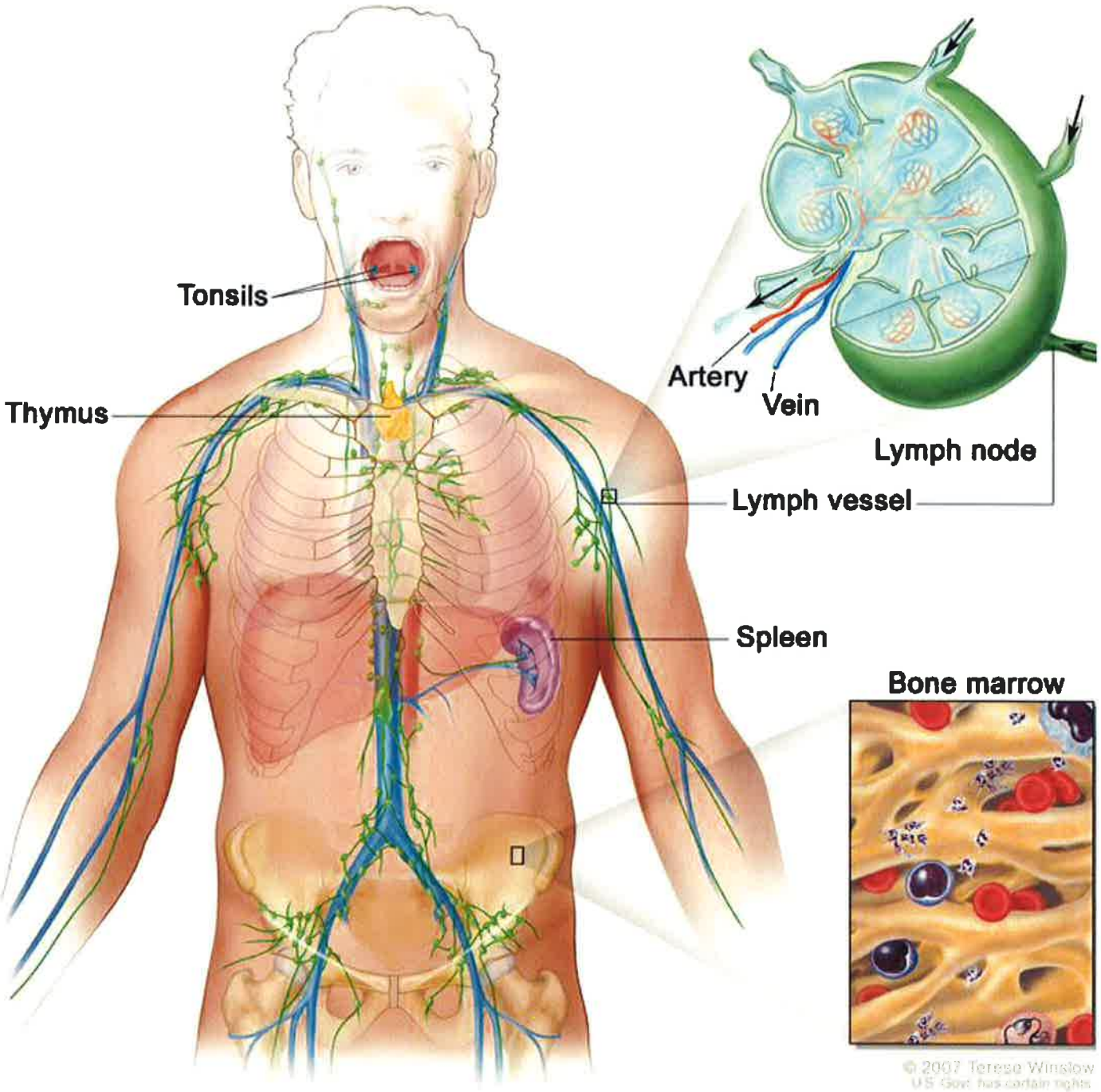
B. Implant Technique

1. Tissue Expander – Implant Technique



During tissue expansion, a balloon inserted under the chest muscle is gradually filled with saline over a period of several weeks or months. The gradual inflation of the balloon stretches the skin and tissue over the chest to make room for an implant.

a. begins with placement of tissue expander beneath the pectoralis muscle and laterally beneath the anterior aspect of serratus anterior muscle (usually done at mastectomy)
b. surgical technique:
   pectoralis major is actively pushed away from the ribs to form a pocket into which the expander is placed.
c. tissue expander is saline-filled envelope to which saline is added in stages post-operatively.
d. some fluid is placed in the expander at the time of expander placement.
e. 3-4 weeks post-op – additional volumes of saline are added at a rate of 60ML/visit.
f. approximately 3-4 weeks after the final saline injection, the tissue expander is removed and the permanent implant is put into place in the same pocket the tissue expander was in.
   i.sometimes the medial pectoral nerve is severed. This nerve innervates the pectorals major to contract and maintain outer contour of the chest.
   ii. Cutting this nerve may enhance the appearance of the reconstructed breast.
   iii.The affected side will be significantly weaker than the unaffected side.
   iv. weak chest muscles cause the shoulder to hunch forward. Plus there is protective posturing.
g. the permanent implant is filled with either saline or silicone (patient decides)
h. nipple reconstruction begins 3 months after placement of permanent implant/ 6-8 weeks later the areola is created using a tattoo technique



D. Preventing Lymphedema

By following certain recommendations made by the American Cancer Society, National Cancer Institute, and American Lymphedema Institute, breast cancer

1. Karen – 38 year old. Very active prior to her surgery.
Unilateral mastectomy with axillary dissection
No reconstruction. Three months post-op

- She has intrascapular pain & Limited range of motion on the affected side (right side)
- Unable to fully extend right elbow

2. Kay – 56 year old
Double mastectomy with axillary dissection
TRAM flap reconstruction Six months post-op, with complaints of:

- body feels "out of whack" & serious back pain.
- Pulling sensation across the chest

Address
_____

Age_____ Height _____ Weight
_____

Please list names and phone numbers for the following:

Physician:
_____Phone#_____

Surgeon_____Phone#_____
___

Physical
Therapist_____Phone#_____
___

Chiropractor_____
Phone#_____

Emergency
Contact_____
Phone#_____

Date of Surgery _____

TYPE of Surgery:

____lumpectomy _____partial mastectomy ____total mastectomy

____Modified radical _____radical

_____R _____L _____ Bilateral _____Lymph Node Removal

_____ Sentinel Node Biopsy Lymphedema: ____yes ____no

Adjuvant Treatment:

Chemotherapy ____Yes ___No Radiation Therapy ____Yes ___No

Date of last treatment:_____

Breast Reconstruction: ____Yes ____ No