Breast Cancer Treatment and Lymphedema

Over the last decade, major advances have been made in the prevention and treatment of breast cancer in the United States, but minimal attention has been given to the treatment side effect of lymphedema (LE).

More than 2 million breast cancer survivors are at lifetime risk of lymphedema, a chronic condition which can cause debilitating side effects.

(www.lymphnet.org; www.cancer.org)

Treatment Decisions:

The Balance of
Mortality & Survivorship
Versus
Morbidity & Treatment Effects

Lymphedema Defined

Lymphedema is an accumulation of protein-rich lymph fluid in the interstitial spaces of an affected body part, most frequently in the extremities.

Lymph is a collection of waste materials, including white blood cells, cell particles, large protein particles, water, bacteria, and debris.

Why is Lymphedema a Problem?

- Concern about appearance
- Increased risk of infection, sometimes life-threatening
- Functional limitations
- Discomfort & pain

Types of Lymphedema

- Primary - Secondary
- Acute - Chronic
- Mild (Minimal), Moderate, Severe
- Stage (Phase) 0 - III (Latent - Elephantiasis)
- May affect arm, breast, and chest in the person treated for breast cancer
- LE affecting women following breast cancer treatment most commonly affects the arm on the side of the body treated for cancer.

Who Is at Risk for Lymphedema?

- People who have had cancer treatment may be at risk for lymphedema.
- Anyone who has undergone the surgical removal of lymph nodes or other surgery or radiation that affects the lymph nodes or lymph vessels is at lifetime risk and may develop this lifelong condition.
- Some consider these at-risk cases to be “latent lymphedema” – lymphedema which has not yet emerged. (Foeldi, Foeldi, & Kubik, 2003)

What Causes Lymphedema?

- Abnormal collection of protein-rich fluid in interstitial spaces of soft tissues caused by an obstruction or malfunction in the lymph system.
- Contributing factors:
  - Surgical removal of lymph nodes
  - Traumatic injury
  - Radiation
  - Infection
  - Impaired lymphatic structure and function
  - Individual predisposition(s) still to be fully understood

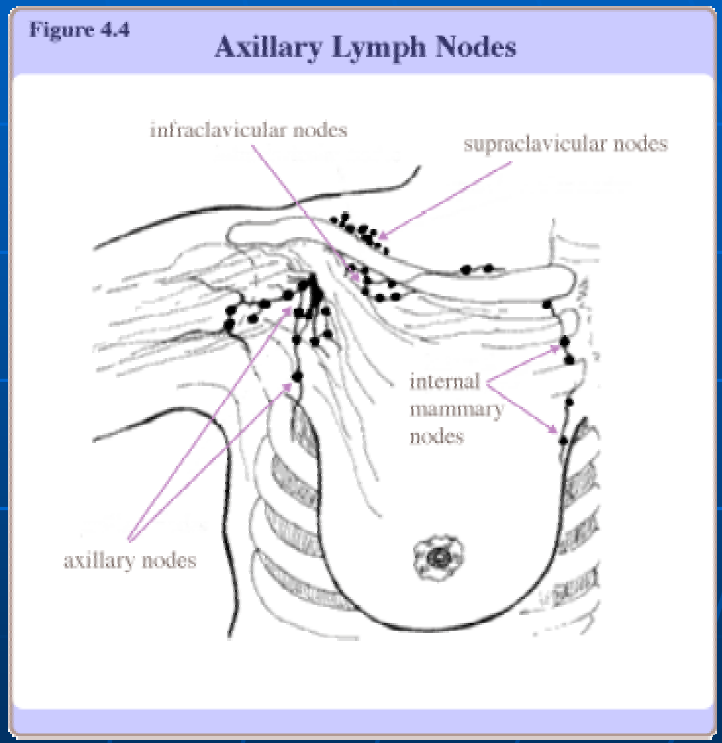
Lymphedema Occurrence

- Estimates vary greatly in the literature and in practice ranging from 6%* to 49%** LE occurrence after breast cancer.
- Discrepancies due to:
  - Inconsistent definitions of lymphedema
  - Subjective and Objective Measurement
  - Procedures (Node, Radiation & Surgery) not always accounted for
  - Varying periods of follow-up

(Ball et al, 1992;* ** Armer & Whitman, 2002; Petrek et al, 2001;** Armer & Stewart, 2005)

Recent Large-Study Findings on LE Occurrence After SLNB

- Lymphedema defined by a 2 cm increase in limb girth
- 2904 patients with SLNB
- 6.9% met criteria for lymphedema at 6 months post-surgery



(Wilke et al, 2005, ACOSOG Abstract; Figure: breastcancer.org; Artist: Mary Kelso Bryson)

Lymphedema Occurrence: Lumpectomy versus Mastectomy

- 251 cases (mixed procedures)
- Circumferential measurements at 4 cm intervals with calculated volume
  - Clinical diagnosis
  - 5% volume change
- Pre-op, 6 months, and 36 months post op
- 20.7% LE at 6 months overall
  - 11.5% (lumpectomy & level II LN)
  - 32.3% (mastectomy & level II LN)

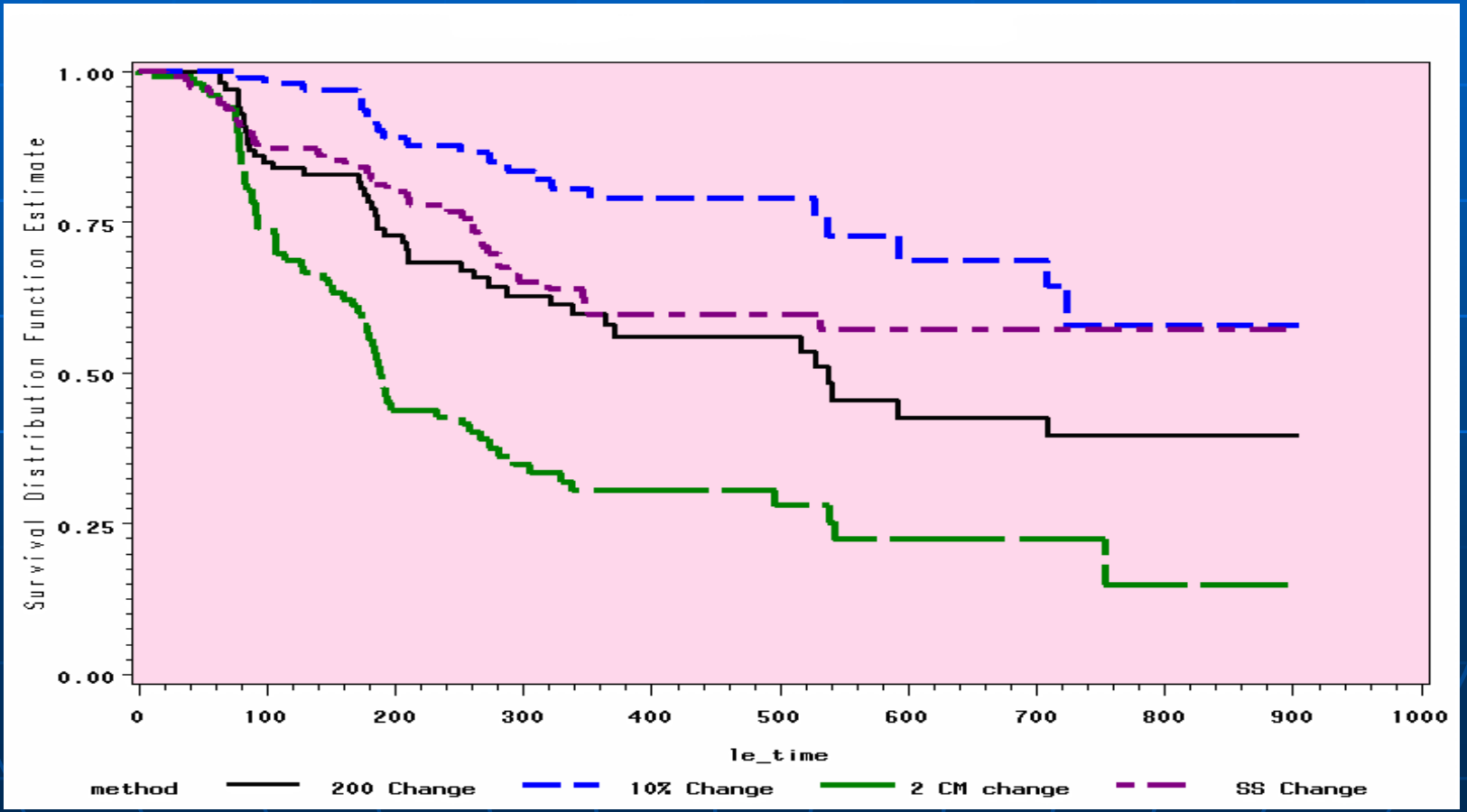
(Clark et al, 2005, UK)

Radiation Effects on Lymphedema

- Lymph nodes are damaged:
  - lymphocytes are depleted and replaced by fatty deposits.
  - fibrosis develops.
  - fluid filtration is blocked or slowed.
- Fibrosis of surrounding tissues may constrict vessels and delay growth of new lymphatic vessels.
- Lymph reabsorption and flow are slowed; LE occurs.
- RCT with 110 patients randomly assigned radiation (no axillary RX): 22% versus 12% developed LE.

(Fajardo, 1994;
Tengrup et al, 2004)

Lymphedema Emergence Over Time Using 4 Definitions of LE: 12 Month Data with Trends to 24 Months



Armer & Stewart, 2005

Comparison of 4 Methods of Defining Lymphedema for Observations at 6, 12, 18, 24 months (CI =95)

- 200 ml difference:
  25% (19-34); 41% (32-50); 50% (40-60); 57% (46-68)
- 10% volume change:
  7% (4-13); 21% (15-31); 26% (19-36); 38% (28-51)
- 2 cm difference:
  46% (37-56); 71% (62-80); 78% (69-86); 82% (74-89)
- Symptom report of heaviness and swelling:
  18% (13-26); 35% (27-45); 39% (31-49)

Lymphedema Risk Reduction

- Avoid infection – meticulous care of skin and nails; avoid blood draws/skin breaks;
- Avoid burns – use sunscreen; use oven mitts;
- Avoid constriction – avoid BP checks on affected limb; consider compression sleeve for airline flights;
- Avoid overuse from strenuous exercise – try not to overtire arm, lift heavy items, or do excessive repetitive movement.

(National Lymphedema Network, www.lymphnet.org; Ridner, 2002)

Treatment Options for the Management of Lymphedema

- Manual lymphatic drainage (MLD) *
- Compression garment *
- Sequential pneumatic pump**

*Both key components of Comprehensive Decongestive (Physio)therapy (CDP/CDT), the favored treatment for lymphedema

**Less favored today by lymphedema experts, but still commonly prescribed by physicians and reimbursed by third-party payers

(National Lymphedema Network, www.lymphnet.org)

General Practice Implications

- Early Identification leads to better outcomes
  - Pre-op arm measurements for comparison
  - Assess arms during office visit (measure)
  - Assess for heaviness and swelling
  - Assess for signs and history of infection
    - Redness, flu-like symptoms, swelling, pain
    - May occur overnight
    - Antibiotics required
    - May recur
  - Refer to certified therapist for treatment
    - “Are you seeing anyone about your arm?”

New Frontiers: Prevention, Early Detection, and Treatment

- Prospective longitudinal intervention study for women preparing for breast cancer treatment: pre-operative baseline and risk-reduction behavioral educational intervention designed to stimulate the lymphatic system*
- Early LE detection leading to earlier and more effective LE treatment
- Evaluation of efficacy of preventive behaviors and treatment interventions

*Armer Research Funded by Lance Armstrong Foundation