Breast Cancer Diagnosis and Effects on Movement

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Who can explain terminology?

Surgical Oncology Followup
• Diagnosis: Right breast cancer s/p bilateral simple mastectomy, right axillary sentinel lymph node biopsy, immediate reconstruction with TRAM flap free tissue transfer.
• History of left breast cancer, s/p lumpectomy and SLN biopsy 2006 (Stage I)

Objectives
• Understand basic anatomy of the breast and lymphatic system
• Understand what musculoskeletal structures are involved in surgical treatment for breast cancer and reconstruction
• Be able to integrate critical information from your patient’s history into your evaluation and treatment, and know when to refer to a lymphedema therapist
### Objectives

- Identify remedial post op breast cancer and lymphatic exercises
- Understand progression to exercising for fitness for the breast cancer patient and appropriate guidelines and precautions

### Overview

- **Scope**
- **Anatomy/Physiology**
- **Medical Overview**
  - Breast cancer, reconstruction, lymphedema
- **Physical Medicine Overview**
  - Treatment models, post-operative effects, risk factors
  - Assessments/interventions breast cancer and lymphedema

- **1 in ___ women will be diagnosed with breast cancer.**
- **There are ____ million breast cancer survivors in the US**
• 1 in 8 women will be diagnosed with breast cancer
• Over 2.9 million breast cancer survivors are alive in the United States today
• (National Breast Cancer.org 2015)

Estimated New Cancer Cases*

<table>
<thead>
<tr>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast</td>
<td>Prostate</td>
</tr>
<tr>
<td>228,870 (29%)</td>
<td>241,740 (29%)</td>
</tr>
<tr>
<td>Lung &amp; bronchus</td>
<td>Lung &amp; bronchus</td>
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<tr>
<td>105,690 (14%)</td>
<td>116,470 (14%)</td>
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<tr>
<td>Colon &amp; rectum</td>
<td>Colon &amp; rectum</td>
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<tr>
<td>70,040 (9%)</td>
<td>73,420 (9%)</td>
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<tr>
<td>Uterine corpus</td>
<td>Urinary bladder</td>
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<tr>
<td>47,130 (6%)</td>
<td>55,600 (7%)</td>
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<tr>
<td>Thyroid</td>
<td>Melanoma of skin</td>
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<tr>
<td>43,210 (5%)</td>
<td>44,250 (5%)</td>
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<tr>
<td>Melanoma of skin</td>
<td>Kidney &amp; renal pelvis</td>
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<tr>
<td>32,000 (4%)</td>
<td>40,250 (5%)</td>
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<tr>
<td>Non-Hodgkin lymphoma</td>
<td>Non-Hodgkin lymphoma</td>
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<tr>
<td>31,970 (4%)</td>
<td>38,160 (4%)</td>
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<tr>
<td>Kidney &amp; renal pelvis</td>
<td>Oral cavity &amp; pharynx</td>
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<tr>
<td>24,520 (3%)</td>
<td>28,540 (3%)</td>
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<tr>
<td>Ovary</td>
<td>Leukemia</td>
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<tr>
<td>22,380 (3%)</td>
<td>26,830 (3%)</td>
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<td>Pancreas</td>
<td>Pancreas</td>
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<tr>
<td>21,850 (3%)</td>
<td>22,000 (3%)</td>
</tr>
<tr>
<td>All sites</td>
<td>All sites</td>
</tr>
<tr>
<td>790,740 (100%)</td>
<td>848,170 (100%)</td>
</tr>
</tbody>
</table>

*American Cancer Society, 2012

Note: Breast cancer rare in men

Rare in men  BUT
an estimated 2,350 men will be diagnosed with breast cancer and
approximately 440 will die each year
(National Breast Cancer.org 2015)
• Where does breast cancer fall on the list of deaths from cancer for women?

Estimated New Deaths*

<table>
<thead>
<tr>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung &amp; bronchus</td>
<td>Lung &amp; bronchus</td>
</tr>
<tr>
<td>Breast</td>
<td>72,590 (26%)</td>
</tr>
<tr>
<td>Colon &amp; rectum</td>
<td>Prostate</td>
</tr>
<tr>
<td>Pancreas</td>
<td>25,220 (9%)</td>
</tr>
<tr>
<td>Ovary</td>
<td>18,540 (7%)</td>
</tr>
<tr>
<td>Leukemia</td>
<td>15,050 (6%)</td>
</tr>
<tr>
<td>Non-Hodgkin lymph</td>
<td>Leukemia</td>
</tr>
<tr>
<td>Uterine corpus</td>
<td>10,040 (4%)</td>
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<tr>
<td>Liver &amp; intrahepatic</td>
<td>8,620 (3%)</td>
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<tr>
<td>bile duct</td>
<td>Liver &amp; intrahepatic</td>
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<tr>
<td>Brain &amp; other</td>
<td>6,570 (2%)</td>
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<td>nervous system</td>
<td>Kidney &amp; renal</td>
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<tr>
<td>All sites</td>
<td>Kidney &amp; renal</td>
</tr>
<tr>
<td>275,370 (100%)</td>
<td>pelvis</td>
</tr>
</tbody>
</table>

*American Cancer Society, 2012

• What age groups by decade are most affected by cancer?
Estimated new cases/deaths, women only in US 2012*

- New cases: 226,870
- Deaths: 39,510

*National Cancer Institute

- What is the main cause of lymphedema?
- What is the incidence of UE lymphedema in women who have breast cancer?

Lymphedema

- Main cause UE lymphedema
  - United States
    - Breast cancer
- Worldwide
  - Filariasis
    - parasite infection
Lymphedema

- Incidence of lymphedema
  - After breast surgery
    - 8% to 56% at 2 yrs post-op (Pasket E, et al, 2012)
    - Approx 80% of women who have lymphedema
      - Onset within 3 years of surgery
      - Remaining approx rate of 1% per year
        - (National Cancer Institute, Cancer.gov)

- Can occur 10-15 years later
- Greater with ALND (axillary lymph node dissection) vs SLNB (sentinel lymph node biopsy)

Lymphedema

- Primary Lymphedema - rare
  - Genetic
  - May be born with it or develop in adolescence

- Secondary Lymphedema
  - Result of cancer, cancer treatments, tumors diseases or any damage to the lymph system

- Lipedema
  - Mostly women, tender, LE's, corkscrew vessels, hereditary
BREAST & LYMPH ANATOMY/PHYSIOLOGY

- Lymph nodes — ventral side of body
- Lymphatic capillaries — vessels — trunks/ducts empty into venous system around the clavicles
- Right lymphatic duct drains right upper quadrant
- Thoracic duct drains remaining
- Both ducts drain into subclavian veins to internal jugular veins

Physiology

Open loop system
Lymph system absorbs excess fluid from extracellular tissue spaces

 Fluid moved to the circulatory system
 Renal system → Excreted

http://www.unm.edu/~jimmy/lymphatic_system.jpg
Physiology

• Results
  – immunity
  – fluid balance
  – digestion of fats

MEDICAL OVERVIEW
TREATMENT

BREAST CANCER
BREAST RECONSTRUCTION
LYMPHEDEMA

Breast Biopsy

• Terminology
• Sentinel node biopsy (SNLB)
  – first node in line with tumor, usually remove more than one
  – Axillary reverse mapping looks at which lymph nodes drain the arm prior to surgery, to preserve if possible
Treatment

- Surgical
  - Breast-conserving surgery
  - Mastectomy
    - Axillary dissection
      - Levels of axillary dissection
- Adjuvant therapy
  - Chemotherapy
  - Radiation

Treatment

- Breast-conserving surgery (partial or segmental mastectomy)
  - Lumpectomy
  - Quadrantectomy
  - May be followed by chemotherapy, then radiation therapy
  (American Cancer Society, 2012)

Treatment

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  - Lumpectomy
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  (American Cancer Society, 2012)
Treatment

• Mastectomy
  – Simple (or total)
    • Breast tissue only
  – Modified radical
    • Breast
    • Axillary lymph nodes
  – Radical
    • Breast
    • Axillary lymph nodes
    • Pectoral muscles

(American Cancer Society, 2012)

Axillary Dissection

• Lymph nodes removed by levels
  – Level I—lateral border pect minor to axilla
  – Level II—medial border pect minor to axilla
  – Level III—all lymph nodes to axilla
• Increasing risk for lymphedema with increasing level
• Still see lymphedema with even sentinel node biopsy

Treatment

Nerve damaged or cut
  – Intercostal brachial n.
  – Long thoracic n.
  – Thoracodorsal n.
  – Pect minor cut, sewn back
  – Pect major may be taken

Presentation
  – Numbness in axilla & posterior upper arm (I,II)
  – Serratus function
  – Latissimus function
  – Scapular elevation/tilt forward (III)
  – Shoulder flexion, adduction, deep inhalation
Treatment

• Adjuvant therapy
  – An adjuvant (from Latin, adjuvare: to aid) (Wikipedia)
  – Systemic therapy before (neoadjuvant) or after surgery
  – Chemo, hormonal therapy and radiation

(Cancer.org)

Treatment

• Adjuvant therapy
  – Chemo given first
    • Allows surgical incisions to heal prior to radiation
    • Variety of drugs
    • Many side effects (Cancer.org)

- Hair loss
- Mouth sores
- Loss of appetite
- Nausea/vomiting
- Low blood cell counts
- Menstrual changes
- Premature menopause
- Feeling unwell
- Fatigue
- Neuropathy
- Cardiomyopathy
- Hand-foot syndrome (numbness, tingling, redness blisters, peeling, sores)
- Chemo brain
- Increased risk of leukemia

Treatment

• Adjuvant therapy
  Radiation
  – Can reduce risk of breast cancer recurrence by approx 70% (Breastcancer.org, 2012)
  – Side effects gradual onset
  – Tissue and vascular changes, lymph nodes
  – Skin can turn pink, red, or tan and be sensitive/irritated
  – Discomfort/swelling (CancerresearchUK.org, 2012)
Treatment

• Adjuvant therapy
  Radiation
    • Fatigue
    • Decreases blood supply to area
      – May prevent certain breast reconstruction
    • Increases risk of lymphedema if over lymph nodes
    • Radiation fibrosis, neuropathy, rib fractures, pericarditis, myelopathy, epidermal degeneration, contractures (CancerresearchUK.org, 2012)

Medical Overview

TREATMENT

BREAST CANCER
BREAST RECONSTRUCTION
LYMPHEDEMA

Reconstruction

• Immediate or 6 months
• Prosthesis/expanders
  – One stage vs two stage delayed reconstruction
  – expanders
Reconstruction

• Implants
  – Most common saline-filled implant (silicone shell filled with sterile saline)
    • 2006 FDA again approved silicone implants
    • Up to half require another surgery within 10 years (break, pain, scar tissue, etc)

Reconstruction

• Autologous Tissue (flaps)
  – Pedicle flap
  – Free flap

TRAM
Transverse Rectus Abdominis Muscle
Pedicle flap
TRAM
Free flap

Lat Flap
Latissimus Dorsi

DIEP
Deep inferior epigastic artery perforator flap
- Similar to TRAM but does not take the muscle
- Micro surgery/tummy tuck
- Less muscle weakness and hernias
Gluteal free flap
Gluteal artery perforator flap

- Gluteal free (gluteal artery perforator) flap
  - Skin, fat, blood vessels and muscle
  - Microsurgery

TUG (transverse upper gracilis flap)

- Skin, muscle and blood vessels cut
- Microscopic surgery

Reconstruction
Complications

<table>
<thead>
<tr>
<th>Implants</th>
<th>Autologous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>Pain</td>
</tr>
<tr>
<td>Infection</td>
<td>Infection</td>
</tr>
<tr>
<td>Decreased flexibility</td>
<td>Decreased flexibility</td>
</tr>
<tr>
<td>Rupture</td>
<td>Numbness</td>
</tr>
<tr>
<td>Capsular contracture</td>
<td>Impaired functioning</td>
</tr>
<tr>
<td></td>
<td>Muscle weakness</td>
</tr>
<tr>
<td></td>
<td>Trunkal lymphedema</td>
</tr>
</tbody>
</table>
Reconstruction
Synthetics

- New, studies in progress
- Use of synthetic mesh, animal grafts to support implants
- AlloDerm and DermaMatrix
  - Products made from donated human skin that are acellular
  - May be used with expanders, implants, nipple reconstruction

Consumer info
Breast Cancer

- Focuses on medical follow up
  - After affects of pharmaceutical interventions
  - Uterine cancer, bone loss, blood tumor markers in blood work, regular mammograms, fear of recurrence
  - Very little recommendations found to follow up with your physiatrist or occupational/physical therapist for rehabilitation, even for RECONSTRUCTION!

PHYSICAL MEDICINE OVERVIEW

- CHRONIC DISEASE VS. PROSPECTIVE MODEL
- POST-OPERATIVE EFFECTS/RISK FACTORS/ASSESSMENT/INTERVENTIONS
- BREAST CANCER
- LYMPHEDEMA
Standard of Care

• Chronic Disease Model vs. Prospective Surveillance Model
  • WHAT DOES THIS MEAN?

Standard of Care

• Prospective surveillance as a rehabilitation strategy to prevent and mitigate post-op complications
  – Pre-operative objective and self-reported measures, structured surveillance
  • Early identification and timely rehabilitation to minimize post-operative effects

Breast Cancer
Post-operative effects/risks

• ROM and motor deficits
• Infection
• Nerve function/neuropathy/neurotoxic/chemotoxic
  – cervical radiculopathy, brachial plexopathy
  – peripheral neuropathy, peripheral polyneuropathy
  – rotator cuff tendinitis, adhesive capsulitis, lateral epicondylitis
  – DeQuervain’s tenosynovitis
Post-operative effects/risks

• Aromatase-inhibitor associated musculoskeletal syndrome
  – Toremifene
    • Post-menopausal women
    • Higher incidence arthralgia and myalgia
• Pain, discomfort, muscle spasms
• Bone metastasis
• DVT risk

Post-operative effects/risks

• Disuse, impaired function
  weight gain, fatigue

Post-operative effects/risks

• Psycho-social issues
  – anxiety, disturbed body image, grieving,
  – fear of cancer and/or recurrence
Specific Post-op Complications/terms

- Cellulitis
  - Acute and spreading infection, warm, red and tender tissues
  - Can cause fever, chills, swollen lymph nodes, blisters

- Abscess
  - Surgical site, tissues swollen and inflamed

- Dehiscence
  - Surgical wound breaks open or splits along the sutured incision line

  (McNeely, M. et al, 2012)

- Hematoma
  - Clotted or partially clotted blood in the surgical wound

- Seroma
  - Serous fluid collection within surgical site in the axillary region, near incision

- Pneumothorax
  - Air in chest (pleural cavity) causing lung collapse

  (McNeely, M. et al, 2012)
Axillary web syndrome/cording

- Most likely due to lymphatic thrombosis after lymph node resection
- Tightens with abduction
- Can develop outside of axilla
- Vessels fibrose and adhere to tissues, causing tissue constriction and pain

Research (Swisher, et al 2011)

- Are Physical Therapists in West Virginia Prepared to Manage the Rehabilitation Needs of Women Following Modified Radical Mastectomy for Breast Cancer?
  - 192 responses of 520 PT’s surveyed in W. Va.
    - Multiple-choice format quiz
      - Topics: impact of medical/surgical cancer treatment on mobility; precautions for PT treatments; therapeutic exercise; and patient education needs

Research (Swisher, et al 2011)

- Conclusions:
  - PT’s in W. Va. have the prerequisite knowledge to provide therapeutic exercise and patient education for women who have had modified radical mastectomy
  - Knowledge is lacking
    - Medical and surgical treatment effects
    - How these impact the physical therapy POC
  - Targeted education in this area needed

• Impairments, disabilities and health related quality of life after treatment for breast cancer: a follow-up study 2.7 years after surgery
  – 55 patients who underwent a modified radical mastectomy or a segmental mastectomy with axillary lymph node dissection, studied retrospectively


• Most frequent impairments
  – Pain (60%)
  – Reduction of grip-strength (40%)
  – Impaired range of motion 9-16%
  – Edema 15%


• Shoulder Disability Questionnaire was 33.7 (sd: 32.1), RAND-36 Health Survey
  – Measure of physical functioning, vitality and health perception
  – Decreased significantly from norm
• Impaired range of motion
  – Significant factors
    • Radiotherapy and chemotherapy
Research (Nesvold, et al, 2010)

- Arm/shoulder problems in breast cancer survivors (BCS) are associated with reduced health and poorer physical quality of life.
  - 256 BCSs all with lymph node metastases examined at a mean of 4.1 years post-surgery
    - mastectomy, lumpectomy and axillary lymph node dissection at level I-II
  - 81 BCSs (32%) with definite ASP (arm/shoulder problems) (ASP+ group)
  - 175 (68%) with minimal or no ASP (ASP- group).

Research (Nesvold, et al, 2010)

- ASP+ was associated with
  - Unemployed
  - Mastectomy
  - Longer follow-up time
  - Radiotherapy to axilla
  - Poorer self-rated health and physical condition
  - Minimal physical activity
  - Increased body mass index

Research (Nesvold, et al, 2010)

- ASP+ was associated with (con’t)
  - Regular intake of analgesics
  - Poorer physical QoL (SF-36)
    - All domains of the SF-36 were significantly associated with
      - Impaired shoulder abduction (> or = 25 degrees difference from opposite side)
    - None of the associations with lymphedema were significant
Research (Nesvold, et al, 2010)

• “We believe it is relevant to inform the women of potential long-term effects and continuation of stretching of the soft tissue in shoulder/arm for a longer period of time than usually recommended. We see the need for more clinical trials, studying different interventions aimed at preventing
• long-term ASPs or achieving improvement of ASPs.”

Research (Johansson & Branje, 2010)

• Arm lymphoedema in a cohort of breast cancer survivors 10 years after diagnosis
  – Small volume at time of diagnosis
  • More important than length of time after operation
  – Edema volume can be kept at a low level for at least 10 years

Now. . .who can explain terminology?

Surgical Oncology Followup

• Diagnosis: Right breast cancer s/p bilateral simple mastectomy, right axillary sentinel lymph node biopsy, immediate reconstruction with TRAM flap free tissue transfer.
• History of left breast cancer, s/p lumpectomy and SLN biopsy 2006 (Stage I)
Tests and Measures

- Pain
- Fatigue scale (0-10)
- ROM, Strength
- Sensation
- Limb Girth
- Integumentary
- Palpation
- Function

Tests and Measures

Pain/Metastatic Bone

- Pain (0-10)
  - Weight-bearing (compress the cancer in a weight-bearing bone)
  - Supine or at rest (night pain)
  - Constant, lasting more than a week or two, unlike any other pain experienced
- Common sites: back, pelvis, upper leg, ribs, upper arm, and skull (90% all metastases)
- Evaluated usually XR or bone scan
TESTS AND MEASURES

• Palpation
  – Pain, tenderness
  – Tissue quality
    • Fibrosis, fullness, spasms/trigger points
  – Scar tissues
  – Axillary cording

Tests and Measures

• Integumentary
  – Temperature (hot or cool)
  – Color
  – Firmness/fullness
  – Wounds, skin changes
  – Consider a picture for the chart
    • Helpful for insurance, obtaining garments, supplies, showing progress

TESTS AND MEASURES

• Function
  – DASH, Disabilities of ARM, Shoulder and Hand
  – Upper Extremity Index 15
Lymphedema Assessment

Stage I: Swollen and feels heavy, pitting.  
Stage II: Swollen and feels spongy. Non-pitting.  
May have fibrosis, limb may feel hard.  
Stage III: Swollen limb very large. Rarely occurs in breast cancer patients. Also called lymphostatic elephantiasis.  
(Cancer.gov)

Lymphedema Assessment

• Perometry and bioimpedence  
  • Replacing the use of water displacement in clinical practice (gold standard)  
• Measuring arm circumference  
• Self-report

Lymphedema Assessment

• Position Statement of the National Lymphedema Network (NLN, 2013)  
  – 6 points circumferential, standardized by institution/all caregivers  
    • Becomes part of patient’s permanent record  
  – Pre surgery measurements if possible  
  – Early detection  
  – Weight loss for overweight  
  – Patient education
Lymphedema Assessment

- 6 points circumferential, both arms
  - Mid-hand
  - Wrist
  - Elbow
  - Upper arm below axilla
  - 10 cm distal to lateral epicondyle
  - 10 cm proximal to lateral epicondyle
- Full document
  - @ http://lymphnet.org/resources/position-paper-screening-and-measurement-for-early-detection-of-breast-cancer-related

Lymphedema Referral

- Refer to certified lymphedema therapist for treatment of lymphedema early on
  - Prevents progression of lymphedema
- Stage 0, stage 1 lymphedema
  - Manage with compression (sleeve/glove/gauntlet)
  - Exercise/precautions
  - Close monitoring/patient education
  - Baseline measurements

CDP (or CDT or CLT)

- Complete (or complex) Decongestive Program or therapy or Complex Lymphedema Therapy
  - Meticulous skin care
  - MLD (manual lymphatic drainage)
  - Compression therapy
  - Exercises
  - Patient education for home management
Lymphedema Therapist Training

• Certified lymphedema therapist
  – 135 hours minimum of CDT coursework
    • 90 hrs practical, hands-on, face to face instruction
  – PT, PTA, OT, COTA, MT, SLP, RN, MD, DO, DC, PA, ATC
• Various programs offered

INTERVENTIONS

• Professional Societies/Organizations
  – The National Lymphedema Network (NLN)
  – International Society of Lymphology (ISL)
  – Lymphology Association of North America (LANA)

Lymphedema Therapist Training

• 2.9 MILLION BREAST CANCER SURVIVORS IN US, LARGEST GROUP OF CANCER SURVIVORS

• Problem of insufficient therapists trained
  – Uneven geographical distribution (Rockson, 2011)
Interventions

- Patient education
- Posture/body mechanics
- Manual therapy
  - Tissue work, lymphatic massage, compression bandaging, kinesiotape
- Intermittent pneumatic compression
- Exercise

Patient Education

- Pain management
- Stress management
- Posture/body mechanics
- Tissue changes
- Lymphedema risk
- Fatigue management/pacing/sleep
- Referral to appropriate websites

Patient Education Sites

- Susan G. Komen (Komen.org)
- American Cancer Society (Cancer.org)
- National Cancer Institute (Cancer.gov)
- MedlinePlus
  - A service of the U.S. National Library of Medicine National Institutes of Health
Patient Education

- Lymphedema: What Every Woman with Breast Cancer Should Know (booklet)
- Exercises after Breast surgery
  - Both available in bulk from the American Cancer Society (free)
- “What Is Lymphedema?” (Cancer.org)

Manual Therapy

- Tissue work
  - Manual stretching
  - Soft tissue mobilization
  - Scar mobilization
  - Myofascial release
  - MLD (manual lymphatic drainage)
- Compression Bandaging (treatment/reduction phase)

Interventions

- Patient education
- Posture/body mechanics
- Manual therapy
- Intermittent pneumatic compression
- Exercise
Manual Therapy

• Tissue work after sub-acute stage of healing
• (10 days to 2 weeks, however each case needs to be evaluated individually)

Scar tissue
Desensitization/massage

• Incision fully healed, no seepage, scabs off
• Percussion (tapping) approx 3 minutes over sensitive areas, lightly and quickly
• Friction massage
  – Fingertip on scar stretching skin different directions, hold approx 5 sec multiple directions
• Massage with Vitamin E oil
• Rubbing different textures along scar (soft to rough)

Manual Therapy

• Radiation considerations
  – Avoid deep tissue work until 6 months post radiation therapy
  – No heat to radiated field–hot tubs, saunas, prolonged hot showers, hot pack, sunburn (opinions vary by case)
• Stretching need long after radiation
Manual lymphatic drainage (MLD)

- Light, skin technique – certified lymphedema therapists
  - Improve fluid removal from congested areas where the lymphatics are not working properly
  - Moves fluid into lymph vessels and lymph nodes that are functioning

Reduction Phase vs Maintainence Phase

- Use of compression bandaging or reduction garment
- Progression to compression stocking or garment for day and night to maintain

Multi-layer compression bandaging

- 3 layers
  - Tricofix or stockinette
  - Artiflex, foam, or fleece
  - Short stretch bandage (Comprilan, Rosidal etc.)
- Hand consideration
  - Finger wrap, gauntlet, glove
Compression Bandaging

• Wear 23 hours out of 24 initially (bathing time)
• Progress to compression stocking day/bandaging night
• If needed, intermittent pneumatic compression in am/pm

Compression Sleeves

• Sleeves
• Various fabrics/construction
• Various compressions
  – 15 mmHg (like ted hose)
  – 20-30 mmHg (light)
  – 40-60 mmHg (strong)- difficult to get on
Intermittent Pneumatic Compression

- Low pressure - between 30 and 60 mmHg, even better (30-40 mm Hg)
- With interstitial fibrosis greater tissue resistance, lower pressure so not cause ischemic damage
- 1 hr 2x day for first month, then 1 hr/day—wide variance

Exercise—Cochrane Review

- Exercise interventions for upper-limb dysfunction due to breast cancer treatment (McNeely ML et al, 2010)
  - Early (1-3 days) exercise
    - More effective in the short term recovery of shoulder flexion
    - Increase in wound drainage volume (drains stayed in longer)

Exercise—Cochrane Review

- Structured exercise programs (including physical therapy)
  - Improved shoulder flexion ROM in the short-term
  - No evidence of increased risk of lymphedema from exercise at any time point
Exercise

- Lymphedema Remedial Exercises (NAJ position paper Exercise 2013)
  - Repetitive, non-resistive motion performed with compression bandaging shown to reduce swelling
    - Assists natural muscle pump
    - Not proven to prevent lymphedema in at-risk individuals, or maintain limb without compression

Exercise

Lymphedema remedial exercise example
Bandages on if needed, all done slowly, 10 reps, up to 3x day
- Diaphragmatic breathing
- AROM Head
- AROM shoulders (option climb rope)
- Diaphragmatic breathing
- Lying down, knee to chest
- Standing trunk lateral flexion
- Massage armpit
- AROM Shoulder IR/ER
- AROM Elbow/forearm/wrist
- Squeeze ball/towel roll
- Head lift with abdominal tightening and exhale
- Diaphragmatic breathing

When it becomes easy to do 10 reps of the arm motions, add 1 to 2 lb weight (or soup can)

Exercise

- Exercises After Breast Cancer Surgery
  - American Cancer Society Booklet, free in bulk
    - Cancer.org
    - 1-800-227-2345
Exercise
Flexibility
• Flexibility exercises
  – Minimize skin scarring/fibrosis/joint contractures/impaired lymph flow
  • From surgery, radiation, or existing lymphedema
  • Good lymphatic flow dependent on full mobility of muscles and joints
  • Treatment in area at risk for lymphedema, or axillary cording may benefit from referral to certified lymphedema therapist
  – Perform slowly and WITH BREATHING
  – Educate patient, lifestyle management

Exercise
• Resistance or Weight-Lifting
  – Lifting body weight, free weights, resistive machines not linked to increase in lymphedema (McNeely et al 2010)
  – Start with low weights, reps and use gradual progression
  – Effective with compression wraps if being treated for lymphedema

Exercise
• Exercise for fitness
• Good body weight reduces lymphedema risk
  – Aerobic, strength and flexibility
Exercise

- Pilates, yoga, Tai Chi, Qigong, aquatic exercise, trampoline rebounding, breathing exercises, and relaxation exercise
  - Not adequately studied but can benefit
  - Co-morbidities and severity of lymphedema considered
  - Seek medical guidance when starting new exercise program

Exercise Recommendations

- American Cancer Society (ACS)
    - Every week healthy adults be moderately active, 150 minutes (2 ½ hrs) or vigorously active 75 minutes (1 ½ hr)

  - Strength training 2-3 times/week, 8-10 exercises of 10-15 reps/set, with at least one set/session
Exercise guidelines (ACSM)

Patient education

– AVOID INACTIVITY
– Exercise at least every other day
– Build up to 30 minutes
– Start slowly and progress slowly
– Moderate intensity
– Choose enjoyable activity
– Aerobic and resistance exercises

Exercise guidelines (NLN)

• Have adequate rest intervals between sets
• Avoid weights that wrap tightly or clothing that cause constriction
• Wear compression sleeves or bandages during exercise (no strong evidence, but recommended)
  – Wearing gauntlet with a sleeve to prevent hand swelling
• Maintain good hydration

Exercise guidelines (NLN)

• Avoid extreme heat or overheating
• Circuit exercising allows muscles to rest in between
• Avoid overuse or sudden increase in exercise duration or intensity of affected body part
• Start gradually, slowly increase, stop for pain, increased swelling or discomfort

SUMMARY
Role of PT in Breast Cancer Tx

Pre-op
- Limb circumference measurements
- Post op exercises
- Things to expect after surgery
- Posture
- Fatigue/endurance
- Importance of early activity

Appropriate referral to Lymphedema Trained therapist

Post-op
- Limb circumference measurements
- Post op exercises
- Early AAROM (to tolerance after drains removed)
- Pain management
- Scar management
- Patient education
- Lymphedema management/education

SUMMARY
Role of PT in Breast Cancer Tx

Whether you are seeing your patient for a neck/shoulder/elbow/back, etc. . . problem immediately post op or years later . . .

This patient will always be a breast cancer survivor

When developing your Plan of Care . . . consider concept of muscle slings/adhesions/fascial restrictions/shoulder ROM/prospective monitoring/psychological effects . . . And PATIENT EDUCATION

Thank YOU!
Breast Cancer Bibliography


