

Integrating Cancer Survivorship and Rehabilitation Across the Continuum of Care

Chris Wilson PT, DPT, GCS

PTP 646 – Metabolic, Endocrine, and Integumentary
Condition Interventions in Practice
July 2013



July 1st Lecture on Intro and Breast Cancer Rehab

Chris Wilson PT, DPT, GCS

PTP 646 – Metabolic, Endocrine, and Integumentary
Condition Interventions in Practice
July 2013



Objectives

1. Describe the importance of cancer rehabilitation and cancer survivorship in a variety of settings
2. Describe the screening process and application of clinical decision making for referrals
3. Identify the barriers related to cancer or its treatment as it relates to rehabilitation



Objectives

4. Describe red flags and identification of further resources or referral needs
5. Identify opportunities for growth and implementation of programs for the patient with cancer as it relates to rehabilitation



Cancer Statistics



Cancer Incidence

In 2012

1,638,910 people

In the US were
diagnosed with cancer



Lifetime Probability of Developing Cancer

Men

1 in 2

Women

1 in 3

Beaumont® HEALTH SYSTEM

The 5 year survival rate - all cancers

1977: 49%

2007: 67%

Beaumont® HEALTH SYSTEM

The Facts

- 1.6 million people were diagnosed with cancer in 2012
- 12.5 million individuals are currently living with cancer diagnosis
- 41% of people in the United States will be diagnosed with cancer at some point in their lifetime
- Overall survivals from 2012 to 2018 was greater than 65%
- Cancer is the second most common cause of death in the U.S.
- By 2020, cancer will be the major cause of death in the U.S.

Beaumont® HEALTH SYSTEM

Cancer Mortality

In 2012

577,190 people

died of cancer

= 1,526 cancer deaths/day

Beaumont® HEALTH SYSTEM

Cancer Mortality

Most Cancer Deaths/Year



1. Lung
2. Prostate
3. Colorectal

Most Cancer Deaths/Year



1. Lung
2. Breast
3. Colorectal

Beaumont® HEALTH SYSTEM

Causes of Death in the United States

| Rank | Cause of Death | No. of deaths | % of all deaths |
|------|------------------------------------|----------------|-----------------|
| 1. | Heart Diseases | 631,636 | 26.0 |
| 2. | Cancer | 559,888 | 23.1 |
| 3. | Cerebrovascular diseases | 137,119 | 5.7 |
| 4. | Chronic lower respiratory diseases | 124,583 | 5.1 |
| 5. | Accidents (unintentional injuries) | 121,599 | 5.0 |
| 6. | Diabetes mellitus | 72,449 | 3.0 |
| 7. | Alzheimer disease | 72,432 | 3.0 |
| 8. | Influenza & pneumonia | 56,326 | 2.3 |
| 9. | Nephritis | 45,344 | 1.9 |
| 10. | Septicemia | 34,234 | 1.4 |

Beaumont® HEALTH SYSTEM

Breast Cancer Statistics

Second leading cause of CA deaths in US women

39,920 deaths in women

410 deaths in men

- American Cancer Society

Beaumont[®] | HEALTH
SYSTEM

Cancer as a Chronic Disease?

- Cancer has become perceived as a chronic disease with long term effects and late effects
- Growing need for:
 - Screenings
 - Awareness
 - Diagnosis and treatment of:
 - Musculoskeletal
 - Cardiovascular
 - Functional Problems
 - Prevention of late effects

Beaumont[®] | HEALTH
SYSTEM

Why Cancer Rehab?

increasing cancer diagnosis

+

decreasing mortality rates =

More People Living with Cancer

Beaumont[®] | HEALTH
SYSTEM

Definition of Cancer Survivorship

- The National Coalition for Cancer Survivorship (NCCS)¹ pioneered the definition of survivor as:
 - from the time of diagnosis and for the balance of life, a person diagnosed with cancer is a survivor
 - This expansive definition of "survivor" includes people who are dying from untreatable cancer
 - NCCS later expanded the definition of survivor even further to include family, friends and voluntary caregivers who are affected by the diagnosis in any way

Beaumont[®] | HEALTH
SYSTEM

Association of Community Cancer Centers Guidelines²

→ ACCC recommends health promotion and wellness:

SECTION 9

Rehabilitation Services

Guideline 1

Comprehensive rehabilitation services are available to cancer patients and their families through the entire cancer care continuum from diagnosis through survivorship.

Rationale

Cancer is a chronic disease that may require adjustment in the physical, social, financial, and emotional aspects of life in order to maximize independence and quality of life within medical status. Professionals experienced in rehabilitation are best suited to meet these needs of cancer patients.

Beaumont[®] | HEALTH
SYSTEM

Reference: http://acc-cancer.org/publications/pdf/publications_cpguidelines.pdf

Commission on Cancer³

(www.facs.org/cancer)



1. Diagnostic
2. Treatment
3. Other clinical services
 - Clinical research patients
 - Guidelines
 - Pain management
 - Oncology nursing
4. Rehabilitation
5. Support (end of life)

Beaumont[®] | HEALTH
SYSTEM

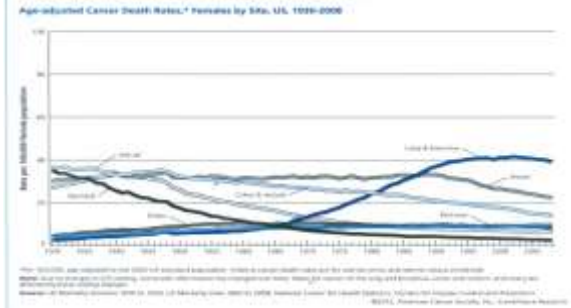
National Survivorship Demographics⁴

- National data from the Advisory Board Company (Healthcare Advisory Board) shows consistent growth in the number of cancer survivors
 - From 1970 to 1990 – Number of U.S. cancer survivors grew from 3 million to 6 million individuals
 - From 1990 to 2005 – Number of U.S. cancer survivors grew from 6 million to 11 million
 - In 2010 – Expected to be 1.5 million new cancer survivors in the U.S.
 - In 2030 – Expected to be 2.3 million new cancer survivors in the U.S.

Beaumont | HEALTH SYSTEM

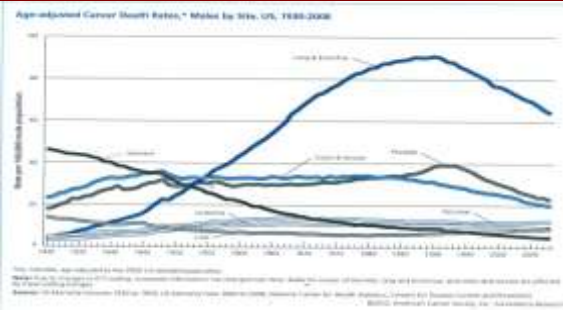
Reference: www.advisoryboardcompany.com

Age Adjusted Cancer Death Rates Females 1930-2008⁵



Beaumont | HEALTH SYSTEM

Age Adjusted Cancer Death Rates Males 1930-2008⁵



Beaumont | HEALTH SYSTEM

Overview of Common Types of Cancer⁵



Beaumont | HEALTH SYSTEM

Cancer Grades

- Grade 1 (Low Grade or Well Differentiated):**
 - Grade 1 cancer cells still look a lot like normal cells.
 - They are usually slow growing.
- Grade 2 (Intermediate/Moderate Grade or Moderately Differentiated):**
 - Grade 2 cancer cells do not look like normal cells.
 - They are growing somewhat faster than normal cells.
- Grade 3 (High Grade or Poorly Differentiated):**
 - Grade 3 cancer cells do not look at all like normal cells.
 - They are fast-growing.

Beaumont | HEALTH SYSTEM

Cancer Pathology

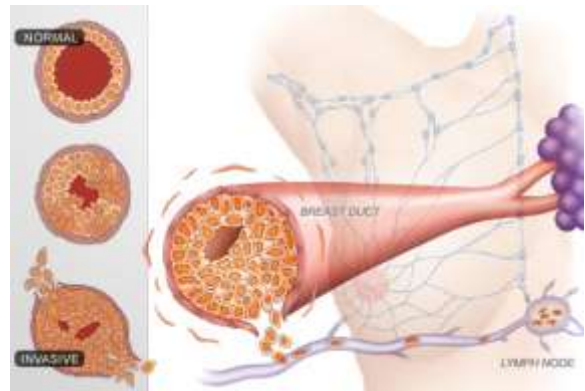
- Tumor type
- Tumor size
- Lymph node status
- Hormone receptor status (estrogen, progesterone, androgens)
- Cellular grade
- Her 2/neu status
- Skin, lymphatic, vascular invasion

Beaumont | HEALTH SYSTEM

Brief Review of Cancer Staging⁵

- “The TNM staging system assesses tumors in three ways:
 - Extent of the primary tumor (T)
 - Absence or presence of regional lymph node involvement (N)
 - Absence or presence of distant metastases (M)
- Example – Breast CA⁶
 - Stage I – Localized disease
 - Stage II – Axillary node involvement
 - Stage III – Advanced regional disease without metastasis
 - Stage IV - Distant Metastases
- T3N2M0
- Once T, N, and M are determined, a stage of I, II, III, or IV is assigned, with stage I being early and stage IV being advanced disease.”

Beaumont[®] | HEALTH SYSTEM



Cancer Treatments Local vs. Systemic Treatments



Beaumont[®] | HEALTH SYSTEM

Brief Review of Cancer Treatments and Side Effects⁶

- **Chemotherapy**
 - “**Adjuvant** - Chemo to destroy left-over (microscopic) cells that may be present after the known tumor is removed by surgery”
 - “**Neoadjuvant** - may be given to attempt to shrink the cancer so that the surgical procedure may not need to be as extensive
 - “**Induction** - given to induce a remission”
 - “**Consolidation** - Chemotherapy given once a remission is achieved. The goal of this therapy is to sustain a remission”
 - “**Palliative** - is given specifically to address symptom management without expecting to significantly reduce the cancer”
- “Over 50 different chemotherapy medications, most are given by IV but some can be given orally”
 - Ex: carboplatin, cisplatin, Gemzar, Cytosan, Taxol.

Beaumont[®] | HEALTH SYSTEM

www.chemocare.com

Brief Review of Cancer Treatments and Side Effects⁶

- **Surgery**
 - may experience slower healing and infection, what structures affected
- **Radiation**
 - xrays, gamma rays, protons, electrons, etc
 - Side Effects: immunosuppression, fragile skin, adhesions, vomiting, diarrhea, fatigue, avascular necrosis, radiation myelitis
 - Radiosensitizers and Radioprotector medications
- **Brachytherapy**
 - placement of radioactive seeds in or near tumor to shrink it
- **Hormonal therapy**
 - systemic therapy commonly used in breast and prostate cancer to slow growth or prevent recurrence of cancer
- **Monitoring**
 - “Watchful waiting” - controversial

Beaumont[®] | HEALTH SYSTEM

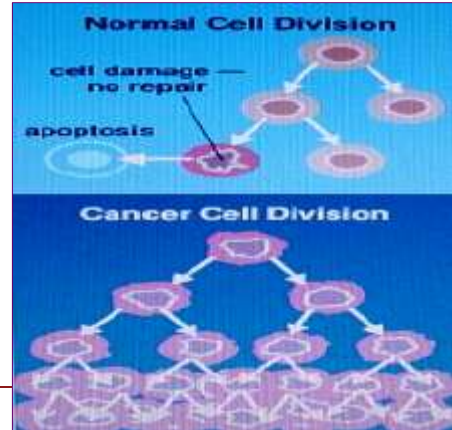
Cancer Pathophysiology

Beaumont[®] | HEALTH SYSTEM

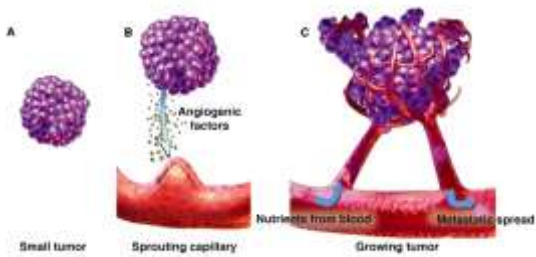
American Cancer Society - Cancer Definition

“Abnormal tissue that grows by cellular proliferation more rapidly than normal and continues to grow after the stimuli that initiated the new growth ceases.”

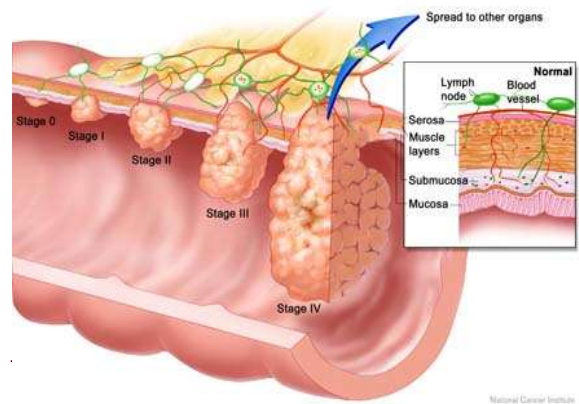
Beaumont HEALTH SYSTEM



Angiogenesis and Metastasis



Beaumont HEALTH SYSTEM



National Cancer Institute

Metastasis

- Stage IV disease or distant metastasis
- Movement of cancer cells from their original location to another part of the body
- Growth of cells in a new location derived from and still named by primary tumor
- Cancer metastasis is treatable
- Cancer metastasis is not curable

Beaumont HEALTH SYSTEM

Common Physical Problems after Cancer Treatment

- | | |
|-----------------------------------|---------------------------|
| • Pain | • Fatigue |
| • Swelling | • Bone loss |
| • Decreased ROM | • Muscle loss |
| • Cording | • Neuropathy |
| • Strength loss | • Weight gain |
| • Soft tissue tightness | • Postural changes |
| • Soft tissue restrictions | • Loss of normal function |
| • Risk for infection & lymphedema | |

Beaumont HEALTH SYSTEM

Who Needs Cancer Rehabilitation?

- People who have had or will have:
 - Surgery
 - Chemotherapy
 - Radiation
 - Remission
 - Terminal illness
- In short, everyone...

Beaumont[®] HEALTH SYSTEM

Cancer Rehabilitation

From diagnosis into survivorship

- Postoperative rehabilitation and education
- Safe return to ADL, work, recreation
- Exercise prescription during and after chemo
- Exercise prescription during and after radiation
- Musculoskeletal treatment throughout cancer care
- Expert musculoskeletal consultant long term
- Lymphedema treatment if indicated
- Follow up on long term and late effects

Beaumont[®] HEALTH SYSTEM

Breast Cancer Rehab



Beaumont[®] HEALTH SYSTEM

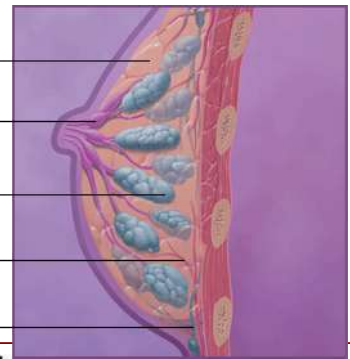
Fatty Tissue

Duct

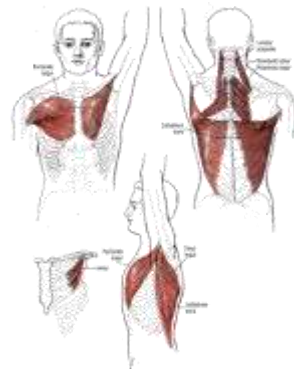
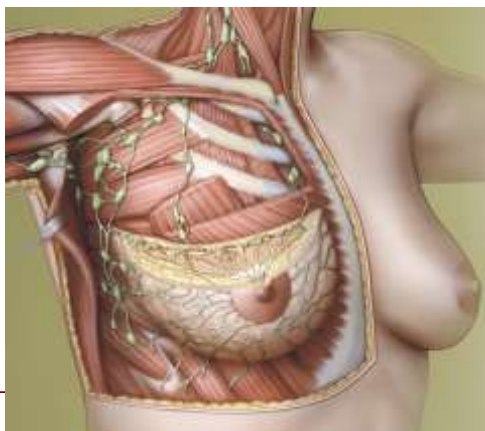
Lobule

Blood Vessel

Lymph Vessel

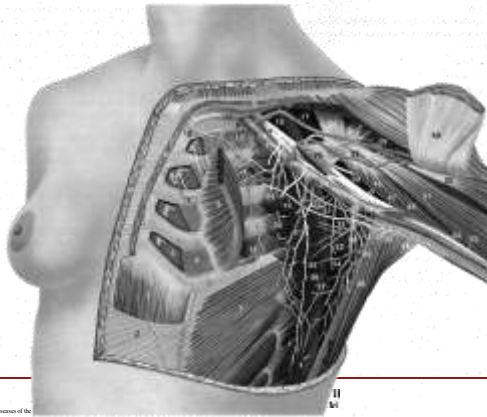


Beaumont[®] HEALTH SYSTEM



Beaumont[®] HEALTH SYSTEM

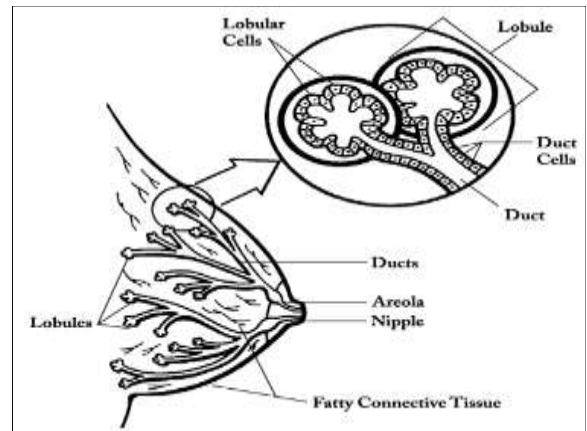
Source: Muscles: Testing and Function • Published by Williams & Wilkins Baltimore-London



Breast cancer

- Most commonly diagnosed cancer in women
- Second leading cause of cancer deaths
- There are more breast cancer survivors than any other kind of cancer

Beaumont[®] | HEALTH SYSTEM



Types of Breast Cancer

- **Invasive breast cancers**
 - **Invasive Ductal** (Infiltrating ductal – IDC)
 - 70%
 - Medullary
 - Mucinous
 - Tubular
 - **Invasive Lobular** (Infiltrating lobular – ILC)
 - 15%
 - **Inflammatory** (IBC)
- **Non-Invasive Breast Cancers**
 - Ductal carcinoma in situ
 - Lobular carcinoma in situ

Beaumont[®] | HEALTH SYSTEM

Chemotherapy and Physical Therapy

Beaumont[®] | HEALTH SYSTEM

Chemotherapy

- A systemic treatment
- The use of drugs IV or oral to kill rapidly dividing cells – “cytotoxic”
- Kills both cancer cells and normal cells
- Some chemos are cardiotoxic

Beaumont® HEALTH SYSTEM

Chemotherapy

- Multiple drugs given together or in sequence
- Given every two to three weeks
- Drug combination determined by:
 - Age
 - Pathology
 - Tumor size
 - Lymph node status
 - Co-morbidities

Beaumont® HEALTH SYSTEM

Cells Damaged by Chemotherapy

- Rapidly dividing cells
- Cancer cells
- Hair follicle cells
- Cells of the esophagus and stomach
- Blood cells
 - Mainly white and red cells

Beaumont® HEALTH SYSTEM

Chemotherapy Side Effects

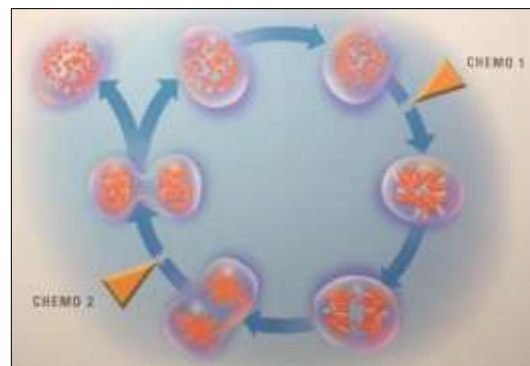
- Fatigue
- Decreased WBC and Immunosuppression
- Hair loss
- Nausea, vomiting and malnutrition
- Neuropathies
- Pulmonary fibrosis
- Renal dysfunction
- Arrhythmias
- Ataxia and Weakness
- Mental foginess

Beaumont® HEALTH SYSTEM

Common Chemotherapy Drugs

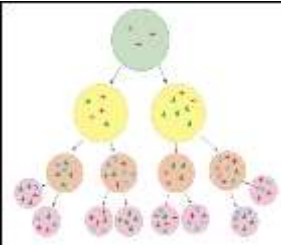
- Adriamycin (doxorubicin)
- Cytosin (cyclophosphamide)
- Taxol (paclitaxel)
- Taxotere (docetaxel)
- Carboplatin
- Gemzar
- Xeloda
- Navelbine
- Epirubicin

Beaumont® HEALTH SYSTEM



Beaumont® HEALTH SYSTEM

Tumor heterogeneity



- Every cell of any particular cancer originated from the same "mother" cell.
- By the time a one-centimeter cancer is detected, the millions of cells that make up the lump have become distant relatives
- Responsive to treatments at different times

Beaumont® HEALTH SYSTEM

Cardiotoxicity

- Certain chemotherapeutic drugs can weaken and damage the heart muscle.
- -Most common drug is Adriamycin
- -Symptoms: Dyspnea on exertion, persistent cough, edema in feet, difficulty with breathing even at rest
- -MUGA scan- monitors the efficiency with which the heart pumps

Beaumont® HEALTH SYSTEM

Physical Therapy for Cardiotoxicity

- Aerobic Exercises
 - Treadmill
 - Bike
 - Gentle strengthening
- Expect impaired cardiac output
 - Normal cardiac output?
- Very similar rehabilitation approach as for a myocardial infarction
 - Close monitoring of HR, BP, SpO₂
 - Use of Borg RPE
 - 6-20 rating
 - Incremental progression of exercise

Beaumont® HEALTH SYSTEM

Osteopenia and Sarcopenia

- Some chemotherapy can cause bone and muscle wasting
- **BONE LOSS – osteopenia/osteoporosis**
 - Weight bearing exercises
 - Walking
 - Weight lifting
- **MUSCLE LOSS - sarcopenia**
 - Weight training

Beaumont® HEALTH SYSTEM

Hearing loss and Chemotherapy

- Signs of ototoxicity from chemotherapy
 - Dizziness
 - Tinnitus
 - Ringing, buzzing, or pulsing in the ears
 - Hearing loss
 - Hearing may continue to decrease even after chemotherapy treatments end
- The most common chemotherapy drugs that cause ototoxicity
 - Cisplatin
 - Carboplatin

Beaumont® HEALTH SYSTEM

Hormonal / biological therapies

- Are IV and oral drugs designed to change the hormonal or biological environment of the cancer cell and therefore restricting growth.
- These drugs are "cytostatic."

Beaumont® HEALTH SYSTEM

Hormonal/Biological Therapies

- Estrogen / Testosterone blockers
- Herceptin
- Avastin
- Bisphosphonates

Beaumont® HEALTH SYSTEM

Normal Blood Counts

- WBC:
 - 5,000 - 10,000
- RBC:
 - 4.5 – 5 million
- Hemoglobin:
 - 12-16 in women
 - 14-18 in men
- Platelets:
 - 150,000-350,000

Beaumont® HEALTH SYSTEM

Radiation and Physical Therapy

Beaumont® HEALTH SYSTEM

Radiation

- Local treatment
- Use high energy rays to kill cancer cells
- External beam radiation
- Brachytherapy
- Curative radiation
- Palliative radiation

Beaumont® HEALTH SYSTEM

Radiation Therapy

- Controls tumor growth and promotes tumor shrinkage by damaging DNA in the nucleus of the cancer cell
- Relatively small doses given over a long period of time to allow the normal tissues to recover.
- Can cause fatigue, reduced RBC and WBC and Platelet counts, nausea and vomiting, skin changes and fibrosis
- Tissue tolerance to radiation
 - Acute – while undergoing treatment (1-4 months)
 - Intermediate – up to 4-12 months
 - Chronic – 1 year up to 8 years

Beaumont® HEALTH SYSTEM

Radiation for Breast Cancer

- Done for nearly all lumpectomies
- Done for some mastectomies
- Entire chest wall radiated
- Axillary & supraclavicular nodes spared unless ~ 4 or more positive lymph nodes.
- Administered daily for ~ 33 treatments

Beaumont® HEALTH SYSTEM



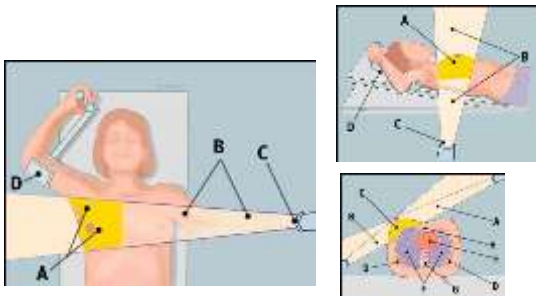
Implications of Radiation

- Skin will burn
 - Desquamation
- Mild to severe fatigue
- Tissue fibrosis
 - 6–36 months post radiation
- May aggravate lymphedema and cording
- Increase in lymphedema risk
- Potential weakness at site

Beaumont[®] | HEALTH SYSTEM

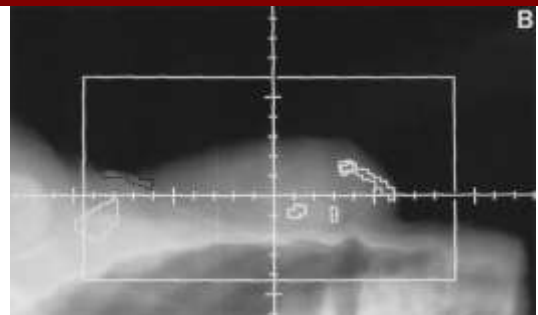


Radiation

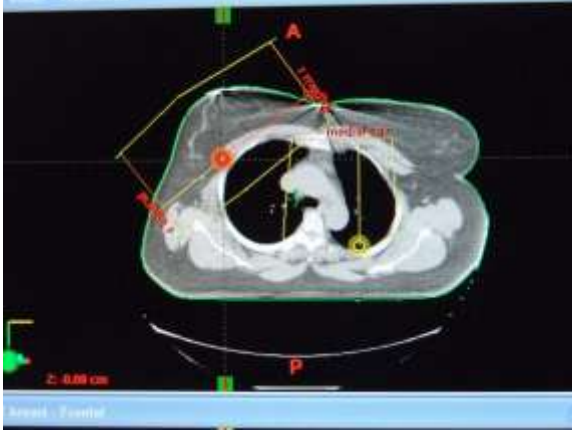


Beaumont[®] | HEALTH SYSTEM

Radiation Simulation



Beaumont[®] | HEALTH SYSTEM



Radiation Therapy Side Effects

- Anemia
- Severe fatigue
- Fever
- Skin color change
- Bone metastasis

Beaumont® HEALTH SYSTEM

Palliative Radiation

- Palliative treatments are not intended to cure.
- Instead, they relieve symptoms and reduce the suffering caused by cancer.
- Examples of palliative radiation therapy are:
 - brain radiation to shrink mets or neoplasms to minimize dysfunction
 - spine or bony tumor or mets which can cause pain or paralysis
 - Esophageal tumor, which can interfere with a patient's ability to eat and drink

Beaumont® HEALTH SYSTEM

Movement Disorders after Radiation

- Decreased ROM
- Delayed Pain
- Delayed breast swelling
- Delayed soft tissue dysfunction
- Decreased strength
- Fatigue

Beaumont® HEALTH SYSTEM

Physical Therapy after Radiation

- Flexibility/ROM program
 - Rx for anterior chest, lateral chest and axilla
 - Stretching
 - Manual therapy
- Strength program
- Aerobic exercise
- Address upcoming treatment(s)

Beaumont® HEALTH SYSTEM

Rehabilitation Goals

- Maximize/maintain ROM
- Maximize tissue mobility
- Minimize fatigue
- Maximize functional level
- Teach HEP for delayed radiation effects

Beaumont® | HEALTH SYSTEM

Breast Cancer Surgery and Physical Therapy Implications

Beaumont® | HEALTH SYSTEM

Breast Cancer Surgery

- Breast-Conserving Surgery (Lumpectomy)
 - Removal of tumor and a clean margin
- Mastectomy
 - Removal of all breast tissue and possibly the fascia over the chest muscle
- Axillary node dissection
 - Removal of sentinel node
 - Level I axillary node
- Reconstruction

Beaumont® | HEALTH SYSTEM

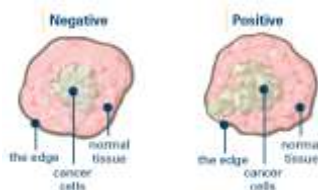
Cancer surgery

- A local treatment
- Surgical removal of the tumor
- Removal of a clean margin
- Lymph node removal for diagnosis

Beaumont® | HEALTH SYSTEM

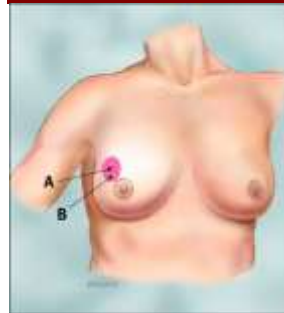
Surgical Margins

- Clean Margins
- Close Margins
- Dirty Margins



Beaumont® | HEALTH SYSTEM

Lumpectomy

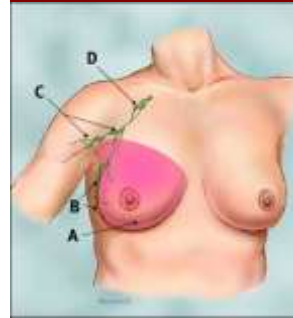


- Lumpectomy:
 - removal of the tumor and a clean margin
- Also known as:
- Partial Mastectomy
 - Breast Conserving Surgery
 - Segmental Mastectomy
 - Quadrantectomy

Beaumont® | HEALTH SYSTEM



Mastectomy

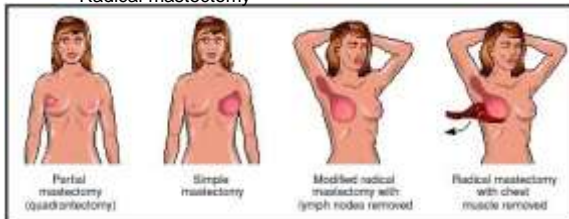


- **UNILATERAL**
 - only affected side
- **BILATERAL**
- **SKIN SPARING**
 - take nipple and breast tissue.
 - Elliptical shape.
- **NIPPLE SPARING**
 - Tumor < 2cm
 - Tumor > 2 cm away from nipple
 - prophylactic

Beaumont® HEALTH SYSTEM

Mastectomy

- Removal of all breast tissue
 - Total (simple) Mastectomy
 - Total Mastectomy with sentinel node biopsy
 - Modified Radical Mastectomy
 - Radical mastectomy

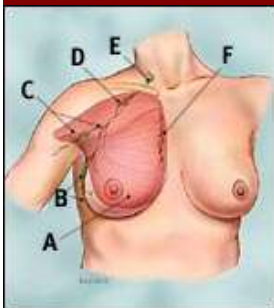


Lymph Node Biopsy

- Sentinel lymph node biopsy
- Axillary dissection

Beaumont® HEALTH SYSTEM

Lymph Node Levels



- **B Level I:** lateral to pec minor
- **C Level II:** under pec minor
- **D level III:** medial to pec minor
- **E level IV:** Supraclavicular
- **F Internal mammary nodes**

Beaumont® HEALTH SYSTEM

Lymph Node Biopsy

Axillary dissection

- Removal of some of the level I and level II lymph nodes
- Average sampling ranges from 10-20 nodes

Beaumont® HEALTH SYSTEM



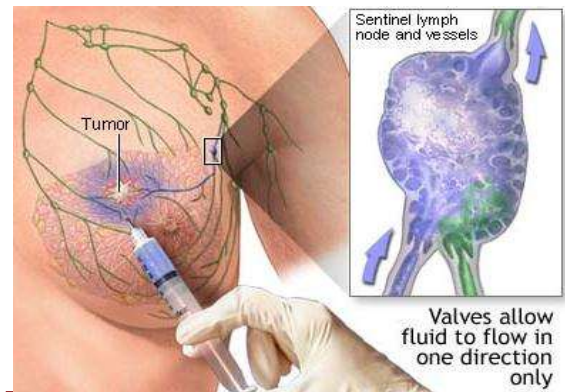
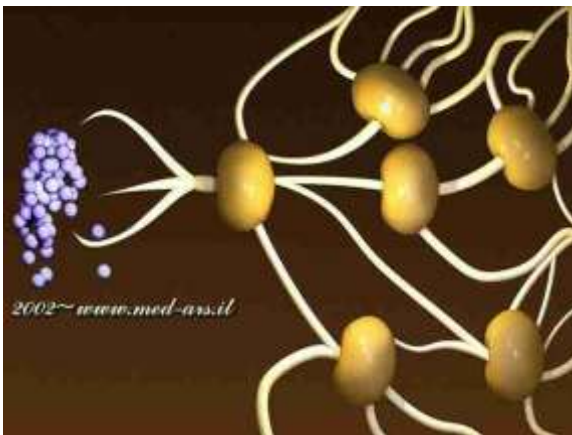
Beaumont HEALTH SYSTEM

Lymph Node Biopsy

Sentinel node biopsy

- Injection of blue dye and/or a radioactive isotope
- Location and removal of first node(s) that drain the tumor bed

Beaumont HEALTH SYSTEM



Beaumont HEALTH SYSTEM



Beaumont HEALTH SYSTEM

Lymph node biopsy

Sentinel node biopsy

- Decreased lymphedema
- Decreased morbidity?

Beaumont HEALTH SYSTEM



Normal Connective Tissue



Scar Tissue (at 2 weeks)



Source: Injury and Repair of the Musculoskeletal Soft Tissues

Beaumont HEALTH SYSTEM

Beaumont HEALTH SYSTEM

Post-surgical Dysfunctions

- Pain
- Swelling
- Decreased ROM
- Decreased Strength
- Soft tissue restrictions and shortening
- Postural changes
- Loss of function
- Cording
- Presents risk for infection & lymphedema

Beaumont HEALTH SYSTEM

Rehabilitation goals

- Eliminate pain
- Restore joint mobility
- Restore/maximize tissue flexibility
- Restore strength
- Restore ADL, vocational, recreational activity
- Safe reintroduction to arm to activity
- Educated in infection & lymphedema risk reduction

Beaumont HEALTH SYSTEM

Lymphatic Cording and Physical Therapy Implications

Beaumont® | HEALTH
SYSTEM



Beaumont® | HEALTH
SYSTEM





Cording related dysfunction

- Pain
- Visual/palpable “cords”
- Loss of shoulder ROM
- Loss of elbow ROM
- Decreased arm strength
- Decrease arm function
- Decrease in ADL, Vocational, & social function

Beaumont[®] | HEALTH SYSTEM

Treatment of Cording

- Treat with cording stretches and skin traction
- Treat soft tissue restrictions/ROM
- Treat weaknesses
- Treat cardiopulmonary system as indicated

Beaumont[®] | HEALTH SYSTEM

Treatment of cording

- Skin traction
- ROM / Stretch
- Superficial heat

AVOID:

- Activities that increase symptoms
- Flexion / extension
- PREs (?)

Beaumont[®] | HEALTH SYSTEM

Rehabilitation goals

- **Decrease reactivity / inflammation**
- **Minimize / Eliminate pain**
- **Minimize / Eliminate swelling**
- Restore/maximize tissue flexibility
- Restore strength
- Restore ADL, vocational, recreational activity
- Safe reintroduction to arm/activity
- Educated in infection / lymphedema risk reduction

Beaumont[®] | HEALTH SYSTEM

Breast Reconstruction and Physical Therapy

Beaumont[®] | HEALTH SYSTEM

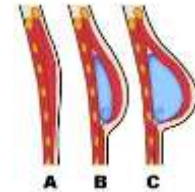
Breast Reconstruction

- Abdominal flaps
 - TRAM Flap (Transverse Rectus Abdominus Myocutaneous)
 - DIEP Flap (Deep Inferior Epigastric Perforator)
- Submuscular Tissue Expander / Implant
- Latissimus (Lat) Flap

Beaumont® | HEALTH SYSTEM

Reconstruction

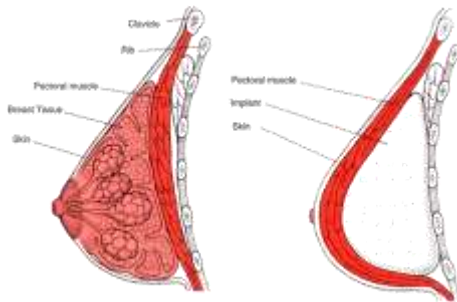
- Implants
 - Tissue expander



Beaumont® | HEALTH SYSTEM

Intact Breast

Reconstructed Breast



Beaumont® | HEALTH SYSTEM

Source: The Merck Manual of Medical Information • Published by Merck Research Laboratories

Expander Reconstruction



- Silastic bladder is placed under pectoralis muscle and is gradually filled with saline to stretch tissue.

Beaumont® | HEALTH SYSTEM

Submuscular Implant

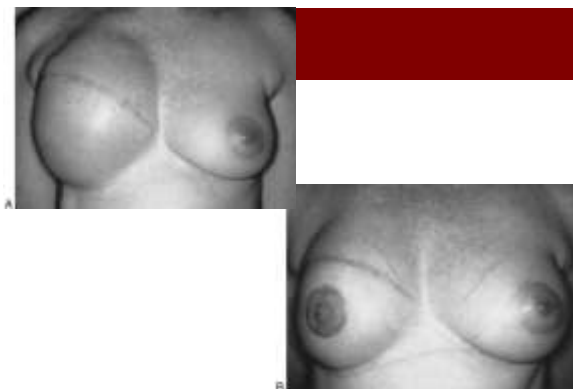


Beaumont® | HEALTH SYSTEM

Submuscular Implant



Beaumont® | HEALTH SYSTEM



Beaumont® | HEALTH SYSTEM

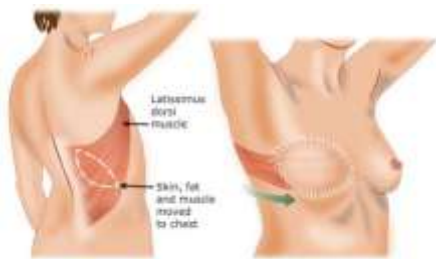
Reconstruction - Latissimus Flap with implant

- The plastic surgeon will make an incision on the skin markings, raising the skin and muscle flap.
- A tunnel will be created under the skin so that the flap can be relocated.
- This tissue flap will go through the tunnel to the front of the chest, keeping its blood supply intact.
- The skin will be positioned so that it fills in the skin that was lost during a mastectomy.



Beaumont® | HEALTH SYSTEM

Latissimus Flap Reconstruction



Latissimus Dorsi Flap Reconstruction

Beaumont® | HEALTH SYSTEM



Beaumont® | HEALTH SYSTEM

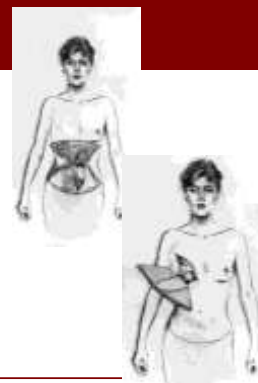
Side effects of lat flap

- - Shoulder Weakness
- - Thoracic and low back weakness
- - Postural Deficits
- - Low Back Pain
- - Loss of Shoulder range of motion
- - Long standing seroma

Beaumont® | HEALTH SYSTEM

Reconstruction

- Abdominal flaps
 - TRAM (Transverse Rectus abdominus Myocutaneous)
 - The surgeon will make an incision, and raise the skin and muscle flap.
 - A tunnel will be created under the skin so that the flap can be relocated.
 - This tissue flap will go through the tunnel to the mastectomy incision.



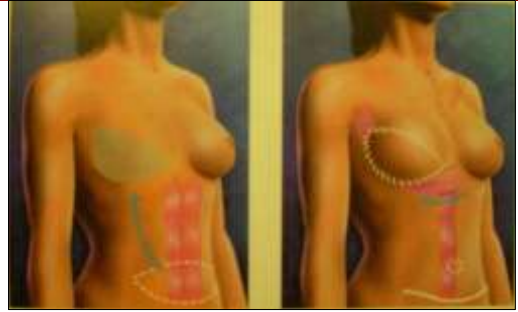
Beaumont® | HEALTH SYSTEM

TRAM / DIEP Flap

- **DIEP** stands for: Deep Inferior Epigastric Perforator
- - It is the Gold standard in reconstruction
- - Refined version of the TRAM
- - Utilizes blood vessels, fat and skin of the abdomen.
- - Not all are candidates for a DIEP

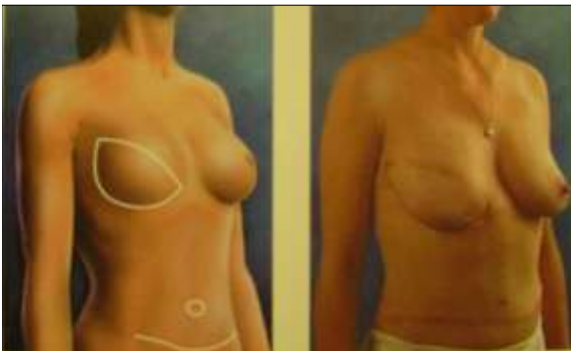
Beaumont® | HEALTH SYSTEM

TRAM / DIEP Flap



Beaumont® | HEALTH SYSTEM

TRAM/DIEP Flap



Nipple Reconstruction



Beaumont® | HEALTH SYSTEM