

Housekeeping

- Restrooms, Breaks, Lunch
- Various levels of knowledge
- Various areas of practice
- Massive amount of information-cannot cover everything in one day
- Questions?



My background

Indiana University-1999-BS in OT

University of Florida-2010-MHS

Nova Southeastern University-2018-
DrOT

Working in Oncology since 2002

Certifications in: Lymphedema,
Kinesiotaping, Cancer Exercise

Currently teaching full-time in a
bachelor level OTA program, home
care prn, teaching with Summit for
over two years, and I volunteer in AAT

**Course
Highlights/
Objectives**

Learn everyday, practical strategies to develop, guide, and support a comprehensive cancer care rehabilitation program



Incorporate over ten outcome measures to confidently assess oncology patients and immediately begin using in your daily practice



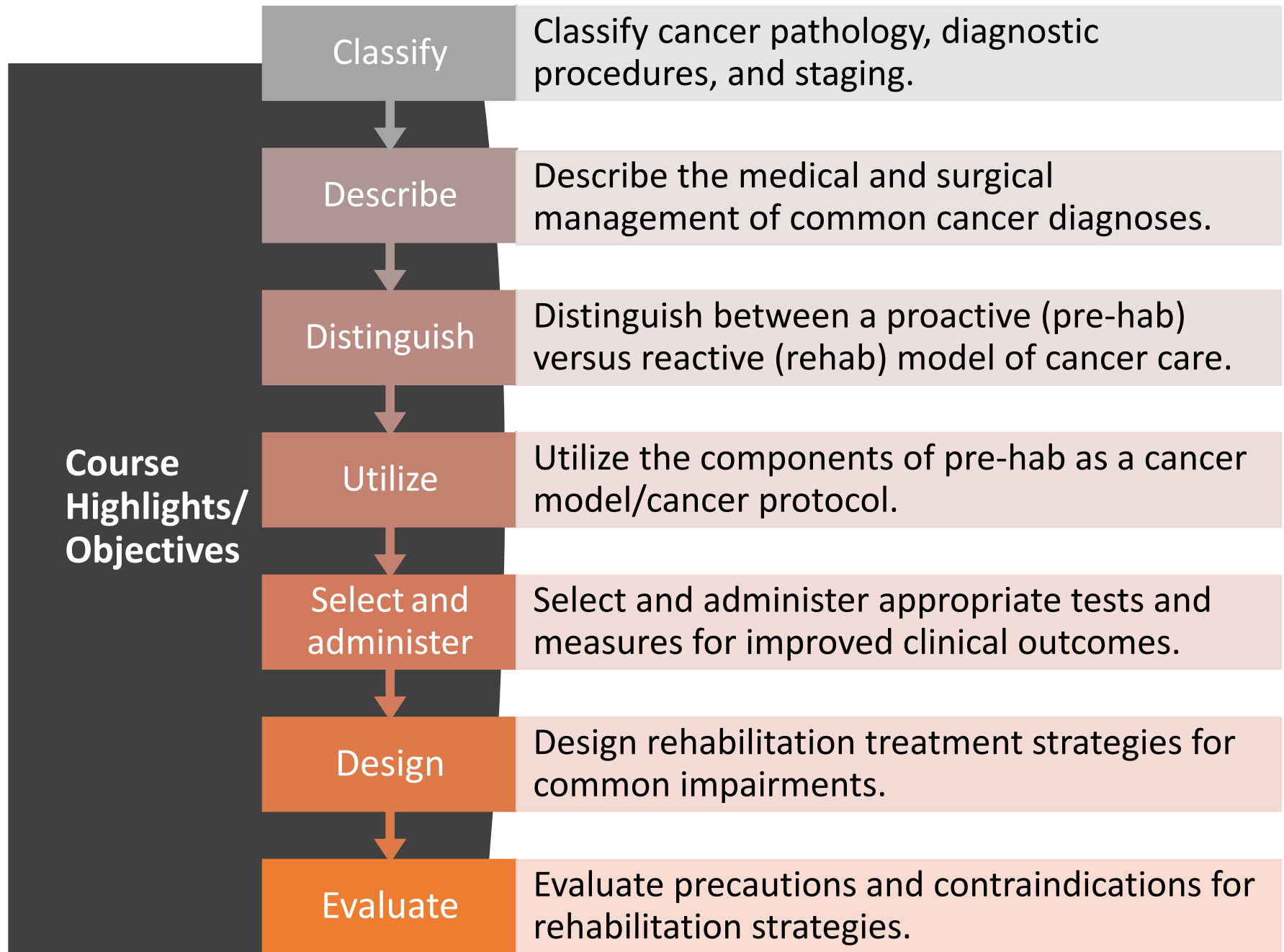
Therapeutic exercise and activity prescription for cancer rehab and lymphedema prevention



Learn the best practice of rehabilitation in conjunction with the American Cancer Society and the American Society of Clinical Oncology's cancer survivorship recommendations and guidelines



Case studies, hands-on labs and therapy based documentation

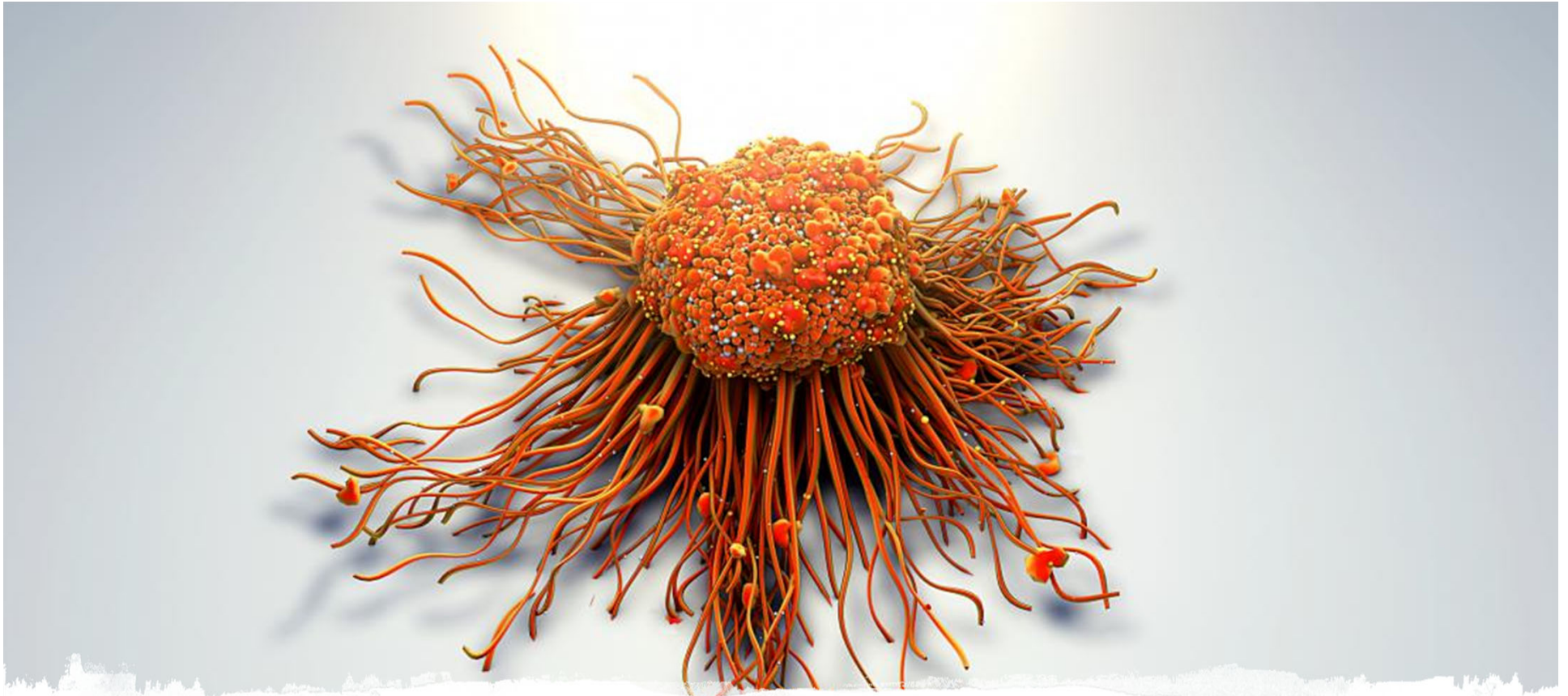


BLOG

<http://blog.summit-education.com/scheiman/>



Presentation is an
ever-changing document.



CANCER

- King of Terrors
- The Hidden Assassin
- The Emperor of all Maladies

Epidemiology of Cancer

- Fastest growing disease on earth. 2nd most common cause of death in the US.
- Cancer cells are always mutating, therefore treatment works for a while and then may cease to continue to be effective. Essentially, cancer becomes resistant to the drugs we use. 9/10 experimental compounds fail.
- Afflicts 1.7 million Americans each year.
- World War I-government gave all soldiers as many cigarettes as they wanted.
- Decrease consumption of smoked meat and fish due to refrigeration has resulted in decreased stomach cancer.
- More people will die from cancer in the next 2 years than those who died in combat in all of the wars the US has ever fought...combined.

Epidemiology of Cancer

1 in 2 men and 1 in 3 women will face a cancer diagnosis in their lifetime.

Most common cancers are breast, prostate, lung, and colon.

Overall, 61% of breast cancer cases are diagnosed at a localized stage and the five-year survival rate is 99% (ACS).

Men at any age may develop breast cancer, but typically it is dx between 60-70 yrs. old. Male breast cancer accounts for less than 1% of all cases.

Epidemiology

Est. that the number of cancer survivors in the US will increase by 37% by the year 2022, and total over 18 million by 2025.

5-year survival rate for all cancers is 69%. 5 yrs +, survival returns to near their non-cancer peers.

10.1 million Americans have a history of cancer, meaning they have no evidence of cancer now and have the same or nearly the same life expectancy as non-cancer peers.

Interesting Statistics:

- Affects 1 in 3; 1 in 4 will die of cancer (Dr. David Sadava)
- Cancer can be a disease of the “aged.”
- So, might we all be fortunate to get cancer?
- February 4th – World Cancer Day



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Epidemiology

Most survivors have more than 1 co-morbidity

- Chemotherapeutic toxicities
- Late effects of radiation therapies
- Adverse sequela of surgical interventions
- Morbidity costs—financial despair as a co-morbidity!

It is cheaper to treat the cancer than the co-morbidity!

- Medical management
- Lost work productivity

See supplemental materials graphs 1-5

Cheville, Troxel, Basford, and Kornblith (as cited in Silver et al., 2013) found that in **163 women with metastatic breast cancer**, **92% had at least one physical impairment**, with a total of 530 impairments identified overall.

Despite more than 90% of the participants needing cancer rehabilitation services (484 of these impairments (91%) required a physical rehabilitation intervention and 469 (88%) required physical and/or occupational therapy), **fewer than 30% received this care.**

Treatment-related impairments continue to be present at checkpoints over a 6-year follow up period (Schmitz, Speck, Rye, DiSipio, and Hayes, 2012).

- **Kenyon, Mayer, & Owens (2014) completed a review of 137 articles studying the long-term or late effects (co-morbidities) of having breast cancer. The researchers determined that survivors of breast cancer faced challenges in the following areas (these co-morbidities pertain to other cancers as well:**
- **psychosocial, emotional, and cognitive well-being, satisfaction**
- **sexuality, body image**
- **anxiety, fear of recurrence, post-traumatic stress disorder**
- **depression, cognitive dysfunction, challenges to physical well-being**
- **fatigue, lymphedema, musculoskeletal symptoms**
- **accelerated bone loss and fractures**
- **pain and skin changes due to radiation**
- **adverse cardiovascular events**

Summary of relevant research evaluating the needs for occupational therapy

Authors	Patient population	Needs identified	Results
Cheville et al. [63]	Adults with metastatic breast cancer	Of 163 patients, 92% had at least 1 impairment, 88 required OT/PT, only 21% received treatment	Impairments are poorly addressed, even in centers with access to therapy
Cheville et al. [22]	Adults with cancer	Of 202 patients, 67% with functional problems, 1 in 5 reported a cognitive issue	No functional problems were addressed by therapy and only 1 patient received OT/PT
Cheville et al. [52]	Adults with stage IV breast cancer	The majority of 163 patients had 3 or more physical impairments	Disability occurs with a number of physical impairments and adverse symptoms accumulate slowly, making them more difficult to find and treat
Holm et al. [20]	Adults with cancer	Of 3,439 patients, one half reported sexual problems and one third reported a need for physical rehabilitation at 14 months after cancer diagnosis	Compared with women with breast cancer, those with colorectal, gynecological, and head and neck cancers reported more needs
Hansen et al. [64]	Adults with cancer	Of 3,439 patients, 60% had an unmet rehabilitation need, 40% had an unmet physical need	Perceived unmet need is related to decreased quality of life
Lehman et al. [65]	Adults with cancer	Of 805 patients, 35% had weakness, 30% had an ADL impairment, 25% had difficulty walking	Mental health issues were common and related to those with physical health issues
Movsas et al. [66]	Adults with cancer in acute care setting	Of 55 patients evaluated, 87% had rehabilitation needs, 76% had deconditioning, 58% had mobility impairment, 22% had ADL deficits	Of the 87% who had rehabilitation needs on admission, 9% received therapy
Pergolotti et al. [8]	Older adults with cancer in outpatient setting	Of 529 patients, 65% had an identified functional deficit (physical health, IADL, falls, cognition)	Only 9% received OT/PT in 1 year of identified deficit

Ross et al. [67]	Adults with cancer	Of 1,490 patients, 39% reported they were not offered needed physical rehabilitation	Younger patients and those who are divorced or single were more likely to have difficulty returning to everyday life
Söderback et al. [68]	Adults with cancer	Of 102 patients, 56% reported a perceived need for OT; only 7 were referred	Once oncologists were aware of OT, they stated that 59% of the patients would need a referral
Veloso et al. [69]	Adults with cancer	Of 4,346 patients, 19% needed physical rehabilitation, 17% needed practical help, 14% needed information on how to return to work	Young age, male sex, low educational level, and living alone increased risk for unmet needs

Abbreviations: ADL, activity of daily living; IADL, instrumental activity of daily living; OT, occupational therapy; PT, physical therapy.

Qualifying conditions and potential interventions for occupational therapy

Qualifying conditions	Types of interventions provided by an occupational therapist
ADL/IADL limitation	ADL/IADL self-care, functional activity participation, therapeutic exercise, durable medical equipment recommendations
Debility, fatigue, poor endurance	Therapeutic exercise, ADL/IADL self-care, functional activity participation, durable medical equipment recommendations, energy conservation
Neuropathy	Neuromuscular re-education, ADL/IADL self-care, therapeutic activity, therapeutic exercise, manual therapy, durable medical equipment recommendations
Lymphedema	Manual therapy, ADL/IADL self-care, functional activity participation
Cognitive decline	Cognitive therapy, ADL/IADL self-care, functional activity participation
Upper extremity impairment	ADL/IADL self-care management, neuromuscular re-education, functional activity participation, therapeutic exercise, manual therapy
Balance	ADL/IADL self-care management, neuromuscular re-education, functional activity participation, therapeutic exercise, durable medical equipment recommendations
Pain	Functional activity participation, ADL/IADL self-care management, therapeutic exercise, durable medical equipment recommendations
Abbreviations: ADL, activity of daily living; IADL, instrumental activity of daily living.	

Never Forget the Care-givers

2015 – 43 ½ million caregivers in the US

2.8 of those were caregivers to individuals with cancer

Roslyn Carter, “there are four types of individuals:

- Those who have been a caregiver
- Those who are a caregiver
- Those who will be a caregiver
- Those who will need a caregiver

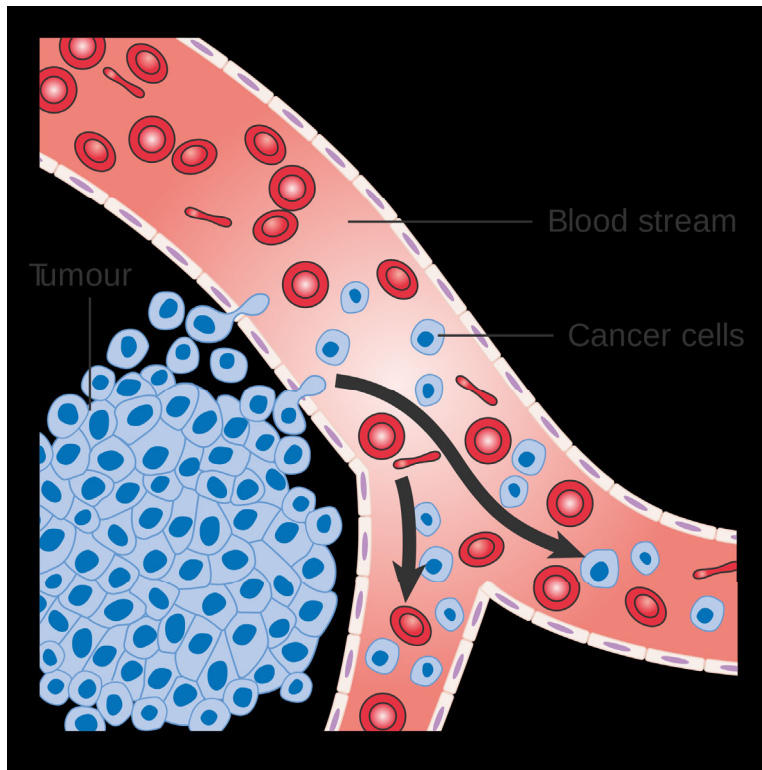
Recording healthcare visits

Resources: Caring Bridge and Lotsa of Helping Hands

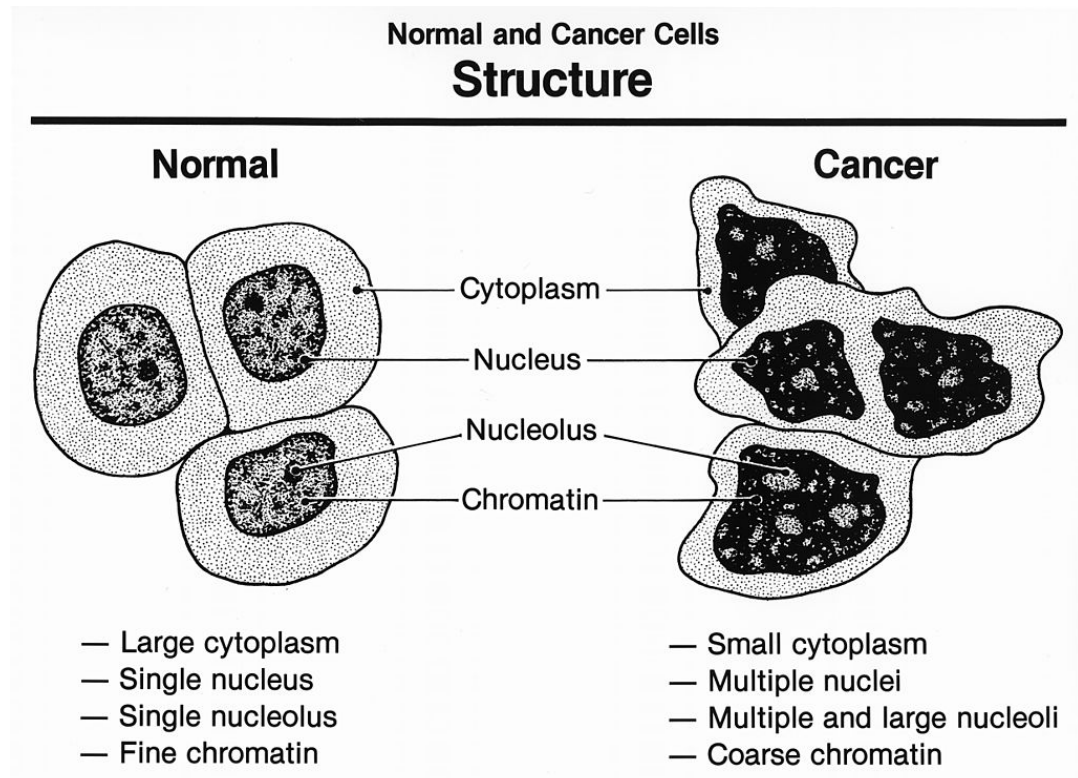
Relaxation Apps: Simply Being and Escapes

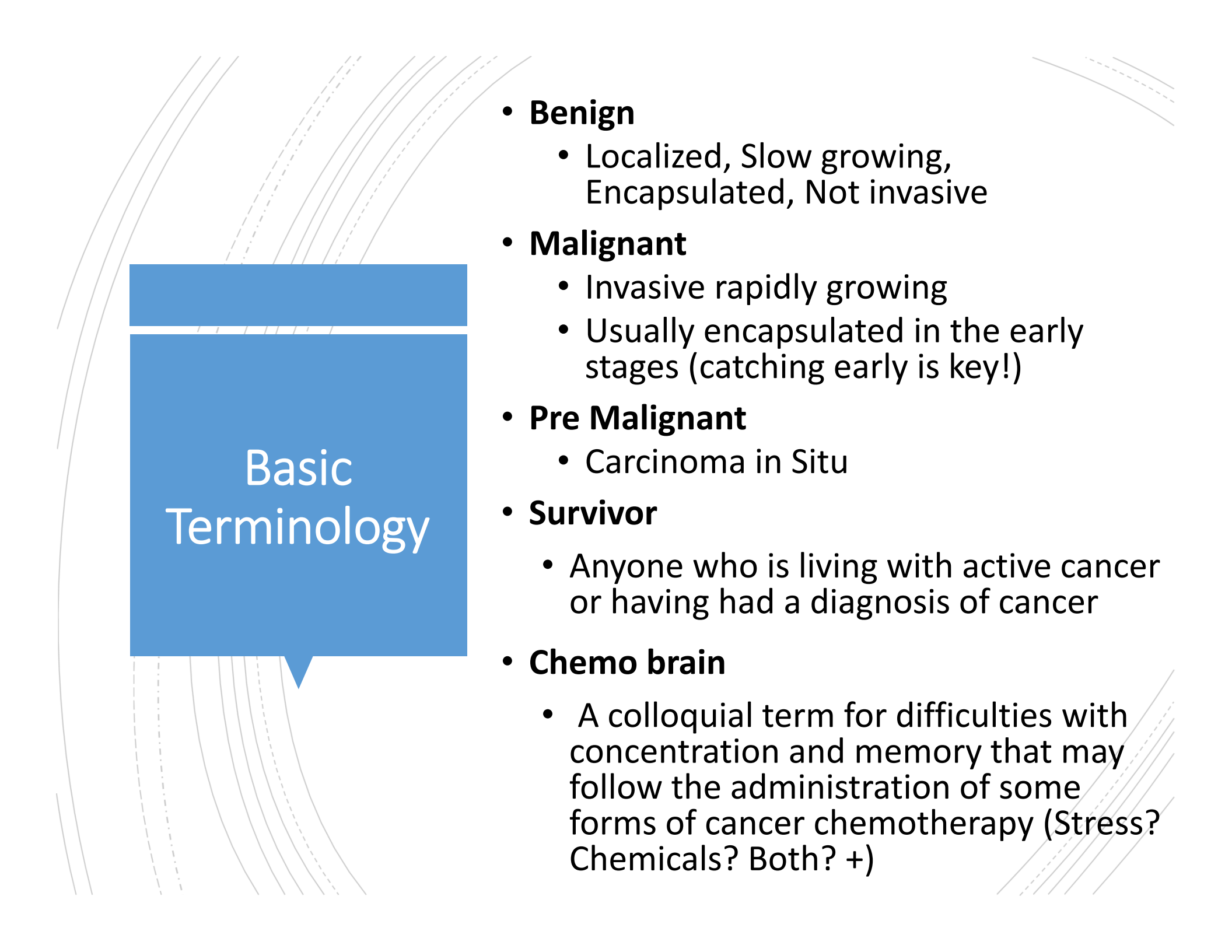
So What *IS* Cancer?

- Group of diseases characterized the **uncontrolled growth and spread of abnormal cells**; if the spread of abnormal cells is not controlled, can result in death. Random...bad multiplication, spontaneous changes-cellular disease.
- This neoplasm or **tumor is non-functional and competes for blood supply and nutrients**. Tumors create their own lymphatics however our normal cells cannot.
- Many causes remain unknown, particularly in pediatric cancers
 - Pediatric cancers are typically more aggressive and result in increased morbidities.



**Contained versus
metastasizing**



The background of the slide features several thin, curved lines in shades of gray, some solid and some dashed, creating a sense of movement and depth. On the left side, there is a blue rectangular box with a white border and a small white triangle at the bottom, resembling a speech bubble. Inside this box, the text "Basic Terminology" is written in white, sans-serif font.

Basic Terminology

- **Benign**
 - Localized, Slow growing, Encapsulated, Not invasive
- **Malignant**
 - Invasive rapidly growing
 - Usually encapsulated in the early stages (catching early is key!)
- **Pre Malignant**
 - Carcinoma in Situ
- **Survivor**
 - Anyone who is living with active cancer or having had a diagnosis of cancer
- **Chemo brain**
 - A colloquial term for difficulties with concentration and memory that may follow the administration of some forms of cancer chemotherapy (Stress? Chemicals? Both? +)

Types of Cancer

Type of Cancer	Site of Origin	Examples
Carcinoma	Within an organ	Skin, mouth, lungs, breast, prostate, colon and rectum, pancreas, ovaries, liver, kidneys
Sarcoma	Within connective tissues, rare for of cancer	Bones, muscles, tendons, cartilage, nerves, fat, blood vessels
Lymphoma	Within lymphatic tissue	Lymph nodes, spleen, thymus gland, bone marrow
Leukemia	Within blood-forming tissue, does not form a tumor	Granulocytes, monocytes, lymphocytes

3 Ways Cancer Can Spread

- **Tissue**

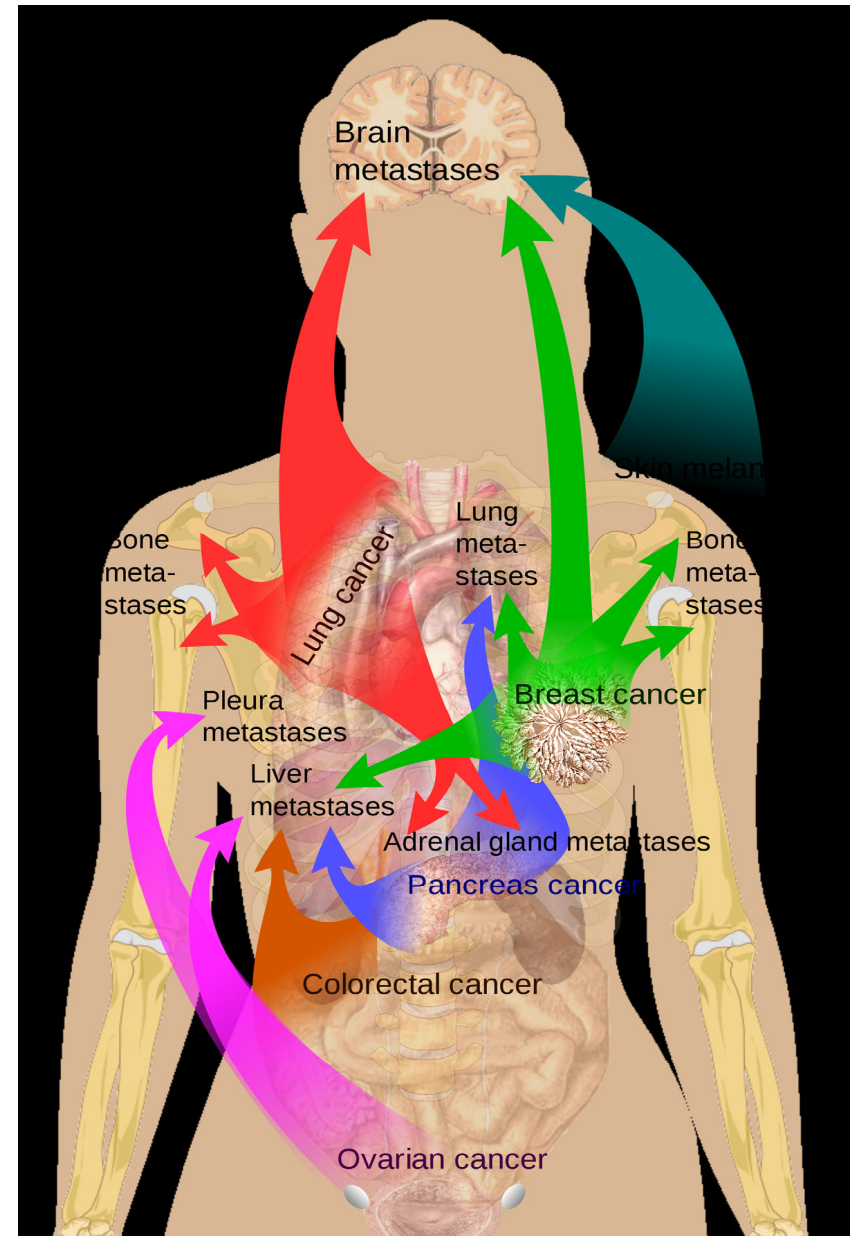
- Cancer spreads from where it began by growing into nearby areas

- **Lymph System**

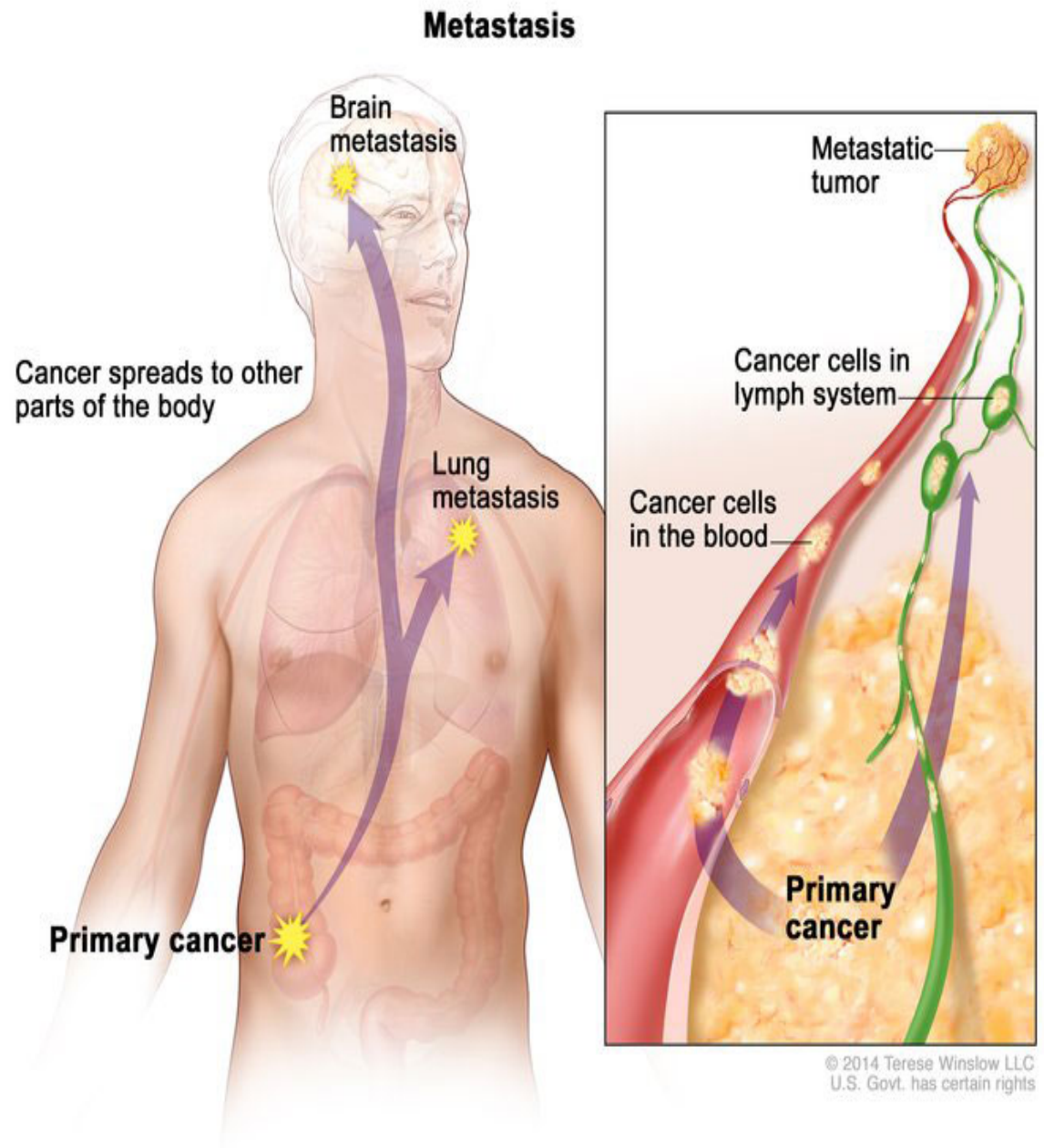
- Cancer spreads from where it began by getting into the lymph system. Travels through the lymph vessels to other parts of the body

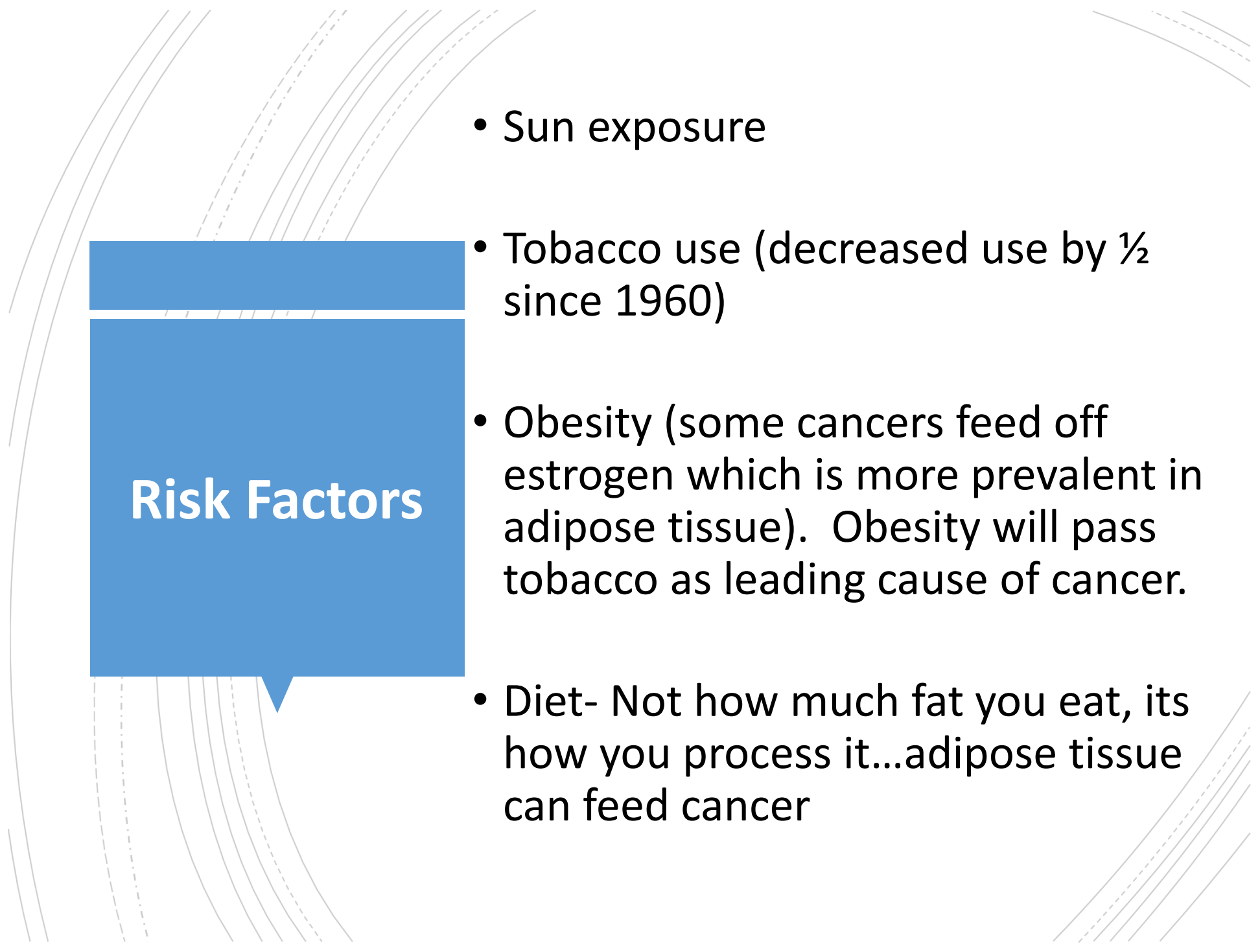
- **Blood**

- Cancer spreads from where it began by the bloodstream.



Still colon cancer, not brain or lung cancer in addition to colon cancer.



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Risk Factors

- Sun exposure
- Tobacco use (decreased use by $\frac{1}{2}$ since 1960)
- Obesity (some cancers feed off estrogen which is more prevalent in adipose tissue). Obesity will pass tobacco as leading cause of cancer.
- Diet- Not how much fat you eat, its how you process it...adipose tissue can feed cancer

ADDITIONAL RISK FACTORS

- HPV-oral, rectal, cervical cancers-Community immunity/herd immunity (vaccinations-girls 9 yo, boys 11 yo, adults up to 45 yo)-see next slide.
- Environmental carcinogens (radiation, asbestos, radon)—increases risk.
- Genetics-Interesting fact: health insurance companies in the US are prohibited from discriminating against patients that test positive for BRCA gene mutation. Life insurance companies however are not.
- Increased alcohol consumption-increases levels of estrogen, may damage DNA cells as well.

ADDITIONAL RISK FACTORS

Age of menarche-earlier=a greater number of years exposed to estrogen-can increase risk of cancer

More pregnancies=less periods=less estrogen-can result in decreased risk.

Later onset of menopause=increased exposure to estrogen can result in greater risk of cancer.

Surprising Number of Cancer Survivors Use Alcohol

- by Kristin Jenkins, Contributing Writer, MedPage Today January 22, 2020

Data from the 2000-2017 National Health Interview Survey on alcohol use and drinking patterns in 34,080 adults with a diagnosis of cancer showed that 56.5% reported using alcohol.

This included 34.9% of cancer patients who said their alcohol consumption exceeded moderate drinking guidelines and 21.0% who admitted to binge drinking.

Cancers most often associated with binge drinking -- melanoma, cervical, head and neck, and testicular cancers -- are the types diagnosed most often in younger cancer patients, the researchers added.

Epidemiology & Risk Factors

- Human Papilloma Virus (HPV)
 - HPV+ cancers tend to have a better prognosis and survival rate compared to similar tumors with HPV- status
 - Additionally, development of FDA-approved HPV vaccines for use in girls **AND** boys may allow for HPV+ tumors to be preventable!
 - Cervarix approved for females ages 9-26
 - Gardasil-4 approved for males ages 9-21 and females ages 9-26

HPV Vaccinations: Updated Recommendations from CDC Aug 2019

- **Children and adults aged 9 through 26 years.**
 - routinely recommended at age 11 or 12 years
 - vaccination can be given starting at age 9 years.
 - catch-up HPV vaccination is recommended through age 26 years who are not adequately vaccinated
- **Adults aged >26 years.**
 - catch-up HPV vaccination is not recommended for all adults aged >26 years. Instead, shared clinical decision-making regarding HPV vaccination is recommended for some adults aged 27 through 45 years who are not adequately vaccinated.
- **Adults aged > 45 years.**
 - not licensed for use

Gardasil protects against HPV 16 and 18 (cancer risk) and HPV 6 and 11 (genital warts) and HPV 31, 33, 45, 52, 58 (lesser risk of malignancy)

The Changing Face of Oropharyngeal Cancer

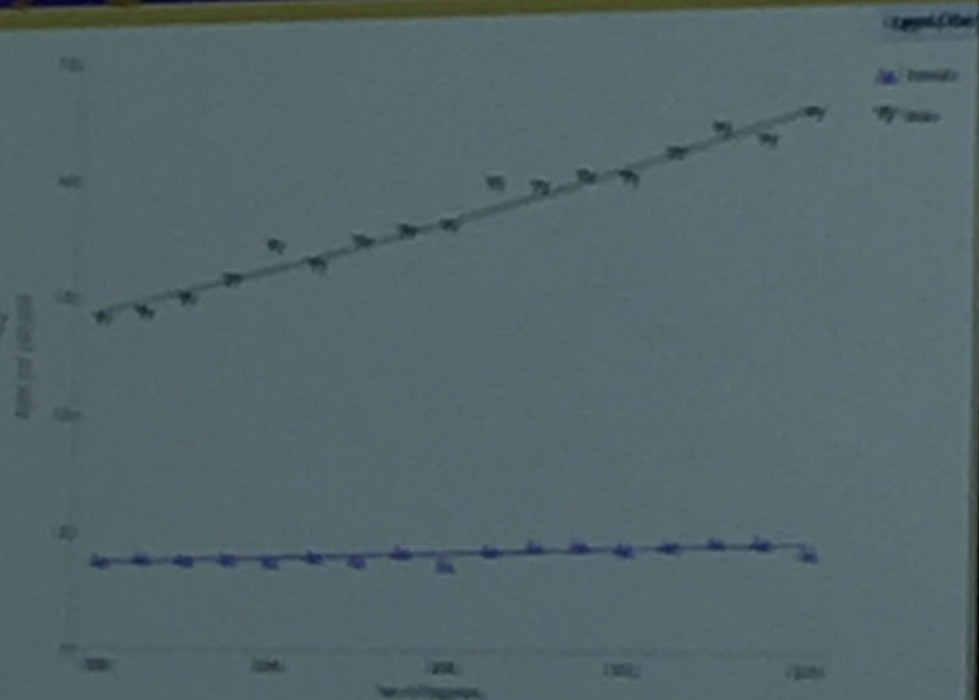
Cancer Site	Oral Cavity	Oropharynx	
		HPV(-)	HPV(+)
Demographics ¹	• Smoker/drinker • Older • More African-Americans • Lower SES • Lower education	• Smoker/drinker • Older • More African-Americans • Lower SES • Lower education	• Nonsmoker • Male • Younger • Caucasian • Multiple partners • Higher SES • Higher education
Common Locations ¹	• Oral Tongue	• Pharyngeal wall • Soft Palate	• Tonsil • Base of tongue
Common Presentations ¹	• Soreness with red or white spots	• Sore throat • Dysphagia • Otalgia	• Painless neck mass

*headandneck.org



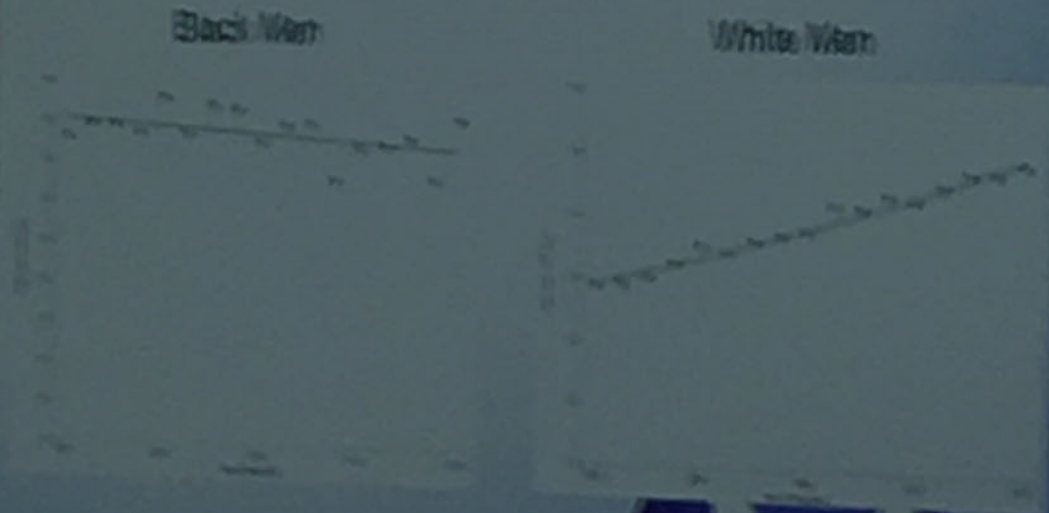
Oropharyngeal Cancer

- Incidence is rising
- Etiology is changing
 - Now ~70% are HPV mediated
- SEER data



HPV related cancer

- 12,500 oropharyngeal
- 10,800 cervical
- 6,000 anal
- vaginal, vulvar, and penile cancers are less common



Risk Factors

- Chronic Inflammation
 - Inflammatory process may begin even without injury, and doesn't end
 - Why the inflammation continues is not always known.
 - Infections that don't go away
 - Abnormal immune reactions to normal tissues
 - Conditions such as obesity.
 - Can cause DNA damage and lead to cancer.
 - For example, people with chronic inflammatory bowel diseases, such as ulcerative colitis and Crohn disease, have an increased risk of colon cancer.
 - More research needed to determine if anti-inflammatory medications, such as aspirin or non-steroidal anti-inflammatory drugs, can reduce the risk of cancer.

Cancer Screening

MRI's pick up everything (not specific) additional testing such as biopsy is recommended.

Screening in older adults for cervical cancer must continue-new sex partners as a result of divorce, widowed, etc.

BLOG: ACS Screening Recommendations

This website provides lots of information on more detailed screening measurements:

<https://www.cancer.gov/about-cancer/screening/screening-tests>

How are Therapists a Part of Prevention Through Screening?

Ask the questions/have the conversation/initiate the lifestyle changes-modifiable risks.



A woman with cancer in one breast has a 3 to 4-fold increased risk of developing a new cancer in the other breast or in another part of the same breast.

Another example: physical activity/exercise reduces breast cancer risk, one study demonstrated that as little as 1.25 to 2.5 hours per week of brisk walking reduced a woman's risk by 18%.



- Imaging
- Endoscopy Procedures
- Biopsy and Cytology Tests
- Laboratory Tests

Diagnostic Methods



- CT
- MRI
- X-Ray and Radiologic Tests
- Nuclear Medicine Scans
- Ultrasound
- Mammogram
- PET scans

Imaging

Cancer Staging-Breast CA Example:

Stage 0

Used to describe non-invasive breast cancers



Stage I

Describes invasive breast



Stage II

Divided into subcategories known as IIA and IIB



Stage III

Divided into subcategories known as IIIA, IIIB, and IIIC



Stage IV

Describes invasive breast cancer that has spread to other organs of the body, such as the lungs, distant lymph nodes, skin, bones, liver, or brain

Website Provides Printable Graphs of Various Types of Cancer Staging

- <https://cancerstaging.org/references-tools/quickreferences/Pages/default.aspx>

Stages of Cancer



Marshfield Clinic

Stage

1

Early Stage

- A small, invasive mass or tumor has been found.
- No spread to lymph nodes or other tissues.
- Sometimes called early-stage or “localized” cancer.

Stage

2

Localized

- Cancer has started to affect nearby tissue.
- Mass may have grown in size.
- Spread to lymph nodes near the mass.

Stage

3

Regional Spread

- Cancer affects more surrounding tissue.
- Mass may have grown in size.
- Spread to distant lymph nodes away from the mass.

Stage

4

Distant Spread

- Cancer has spread to other tissues or organs beyond the region where it originated.
- Sometimes called advanced or metastatic cancer.

Examples of survivor
education materials
available on the internet

For more cancer topics and advice visit:

www.shine365.marshfieldclinic.org/category/cancer-care

To learn about oncology specialty services at Marshfield Clinic:

www.marshfieldclinic.org/specialties/cancer-care

Shine365

Marshfield Clinic

Just one
example of the
complexity of
cancer staging

American Joint Committee on Cancer Melanoma of the Skin Staging 7th EDITION

Definitions

Primary Tumor (T)

- TX** Primary tumor cannot be assessed (for example, curettaged or severely regressed melanoma)
- T0** No evidence of primary tumor
- Tis** Melanoma in situ
- T1** Melanomas 1.0 mm or less in thickness
- T2** Melanomas 1.01–2.0 mm
- T3** Melanomas 2.01–4.0 mm
- T4** Melanomas more than 4.0 mm

NOTE: a and b subcategories of T are assigned based on ulceration and number of mitoses per mm², as shown below:

T CLASSIFICATION	THICKNESS (mm)	ULCERATION STATUS/MITOSSES
T1	≤1.0	a: w/o ulceration and mitoses <1/mm ² b: with ulceration or mitoses ≥1/mm ²
T2	1.01–2.0	a: w/o ulceration b: with ulceration
T3	2.01–4.0	a: w/o ulceration b: with ulceration
T4	>4.0	a: w/o ulceration b: with ulceration

Regional Lymph Nodes (N)

- NX** Patients in whom the regional nodes cannot be assessed (for example, previously removed for another reason)
- N0** No regional metastases detected
- N1–3** Regional metastases based upon the number of metastatic nodes and presence or absence of intralymphatic metastases (in transit or satellite metastases)

NOTE: N1–3 and a–c subcategories assigned as shown below:

N CLASSIFICATION	NO. OF METASTATIC NODES	NODAL METASTATIC MASS
N1	1 node	a: micrometastasis ¹ b: macrometastasis ²
N2	2–3 nodes	a: micrometastasis ¹ b: macrometastasis ² c: in transit met(s)/satellite(s) without metastatic nodes
N3	4 or more metastatic nodes, or matted nodes, or in transit met(s)/satellite(s) with metastatic node(s)	



Financial support for AJCC
7th Edition Staging System
provided by the American Cancer Society



Distant Metastasis (M)

- M0** No detectable evidence of distant metastases
- M1a** Metastases to skin, subcutaneous, or distant lymph nodes
- M1b** Metastases to lung
- M1c** Metastases to all other visceral sites or distant metastases to any site combined with an elevated serum LDH

NOTE: Serum LDH is incorporated into the M category as shown below:

M CLASSIFICATION	SITE	SERUM LDH
M1a	Distant skin, subcutaneous, or nodal mets	Normal
M1b	Lung metastases	Normal
M1c	All other visceral metastases Any distant metastasis	Normal Elevated

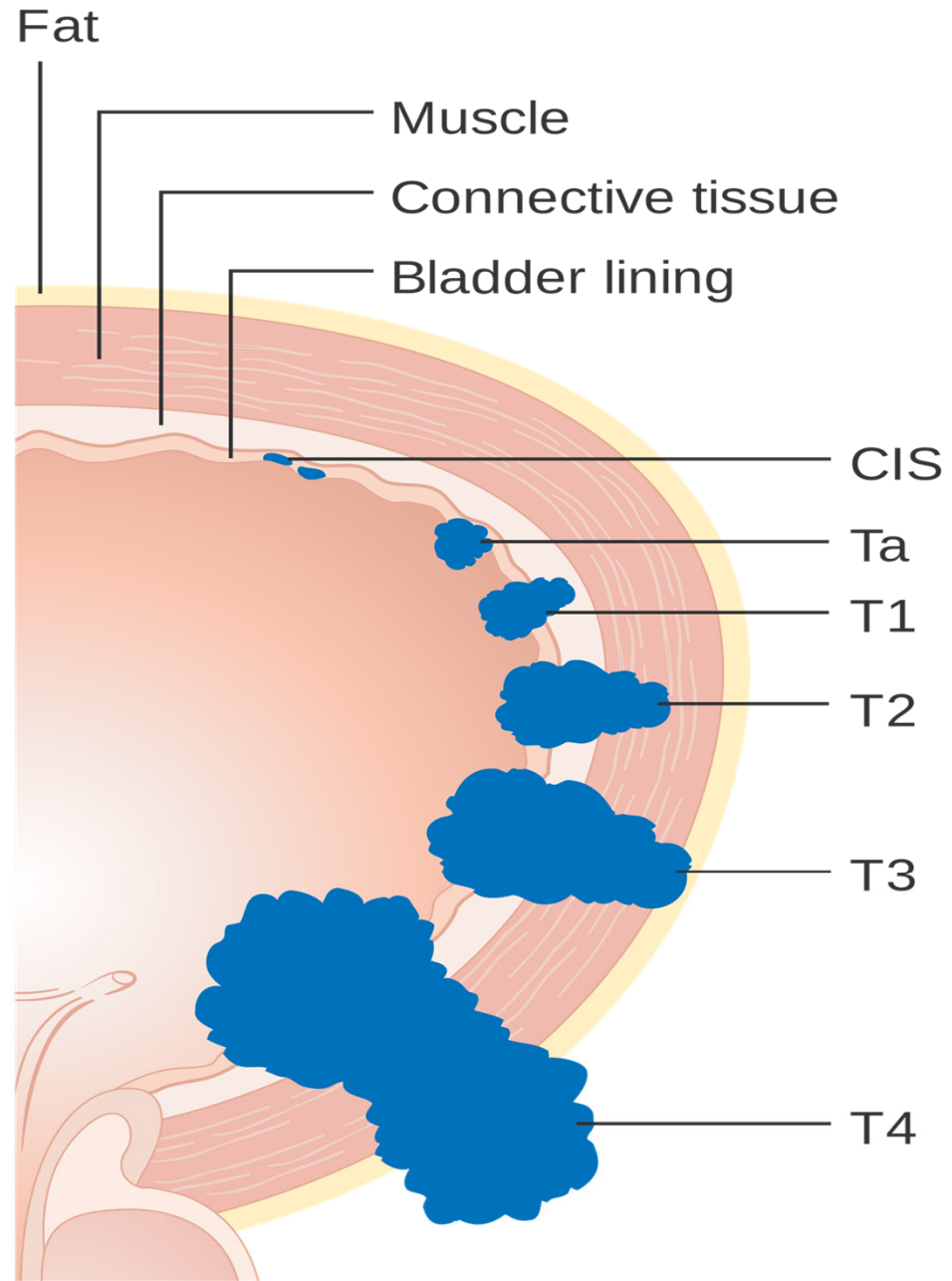
ANATOMIC STAGE/PROGNOSTIC GROUPS											
Clinical Staging ³						Pathologic Staging ⁴					
Stage 0	Tis	N0	M0	0		Tis	N0	M0			
Stage IA	T1a	N0	M0	IA		T1a	N0	M0			
Stage IB	T1b	N0	M0	IB		T1b	N0	M0			
	T2a	N0	M0			T2a	N0	M0			
Stage IIA	T2b	N0	M0	IIA		T2b	N0	M0			
	T3a	N0	M0			T3a	N0	M0			
Stage IIB	T3b	N0	M0	IIB		T3b	N0	M0			
	T4a	N0	M0			T4a	N0	M0			
Stage IIC	T4b	N0	M0	IIC		T4b	N0	M0			
Stage III	Any T	≥ N1	M0	IIIA		T1-4a	N1a	M0			
						T1-4a	N2a	M0			
						T1-4b	N1a	M0			
						T1-4b	N2a	M0			
						T1-4a	N1b	M0			
						T1-4a	N2b	M0			
						T1-4a	N2c	M0			
						T1-4b	N1b	M0			
						T1-4b	N2b	M0			
						T1-4b	N2c	M0			
Stage IV	Any T	Any N	M1	IV		Any T	N3	M0			
						Any T	Any N	M1			

Notes

- Micrometastases are diagnosed after sentinel lymph node biopsy and completion lymphadenectomy (if performed).
- Macrometastases are defined as clinically detectable nodal metastases confirmed by therapeutic lymphadenectomy or when nodal metastasis exhibits gross extracapsular extension.
- Clinical staging includes microstaging of the primary melanoma and clinical/radiologic evaluation for metastases. By convention, it should be used after complete excision of the primary melanoma with clinical assessment for regional and distant metastases.
- Pathologic staging includes microstaging of the primary melanoma and pathologic information about the regional lymph nodes after partial or complete lymphadenectomy. Pathologic Stage 0 or Stage IA patients are the exception; they do not require pathologic evaluation of their lymph nodes.

TNM Method of Cancer Staging

- **T** = primary Tumor size
- **N** = lymph Node status
- **M** = Metastasis
- Staging gives us a perspective, tells us more of the story.



Medical Interventions

- What is the **goal (Survivor's Goal)**?
- Curative vs. Palliative
- Typically a combination of interventions exist:
 - Radiation therapy
 - Chemotherapy
 - Surgery
 - Hormone therapy
 - Immunotherapy
 - Anti-angiogenesis
 - Stem cell transplant

Google: cancer.org

- [Anemia](#)
- [Appetite Loss](#)
- [Bleeding and Bruising \(Thrombocytopenia\)](#)
- [Constipation](#)
- [Delirium](#)
- [Diarrhea](#)
- [Edema \(Swelling\)](#)
- [Fatigue](#)
- [Fertility Issues in Boys and Men](#)
- [Fertility Issues in Girls and Women](#)
- [Hair Loss \(Alopecia\)](#)
- [Infection and Neutropenia](#)
- [Lymphedema](#)
- [Memory or Concentration Problems](#)
- [Mouth and Throat Problems](#)
- [Nausea and Vomiting](#)
- [Nerve \(Peripheral Neuropathy\)](#)
- [Pain](#)
- [Sexual Health Issues in Men](#)
- [Sexual Health Issues in Women](#)
- [Skin and Nail Changes](#)
- [Sleep Problems](#)
- [Urinary and Bladder Problems](#)

Rehabilitation as Intervention

Rehab approach to the treatment of cancer originated with the National Cancer Act of 1971. This legislation declared cancer rehabilitation as an objective and directed funds to the development of training programs.



In 1972 the National Cancer Institute sponsored the National Cancer Rehabilitation Planning Conference, which identified four objectives:

Psychosocial
support

Optimization
of physical
functioning

Vocational
counseling

Optimization
of social
functioning

Where will we see these patients?



Acute hospitals



Inpatient rehab



Subacute rehab



Outpatient therapy



Home care



Skilled nursing facilities



Hospice and palliative care



Survivorship and wellness

Radiation Therapy



Use of ionizing radiation for the treatment of neoplasms by a radiation oncologist



Nearly 2/3 of all cancer patients will receive radiation at some point



Ionizing energy therefore it does not induce heat or other manifestations of energy transfer that can be felt by the patient-painless procedure



Can also work to kill healthy tissue; radiation oncologists



Attempt to concentrate the radiation in tumors and



Minimize surrounding tissue



Radiation “tattoos”

Types of Radiation

External-beam

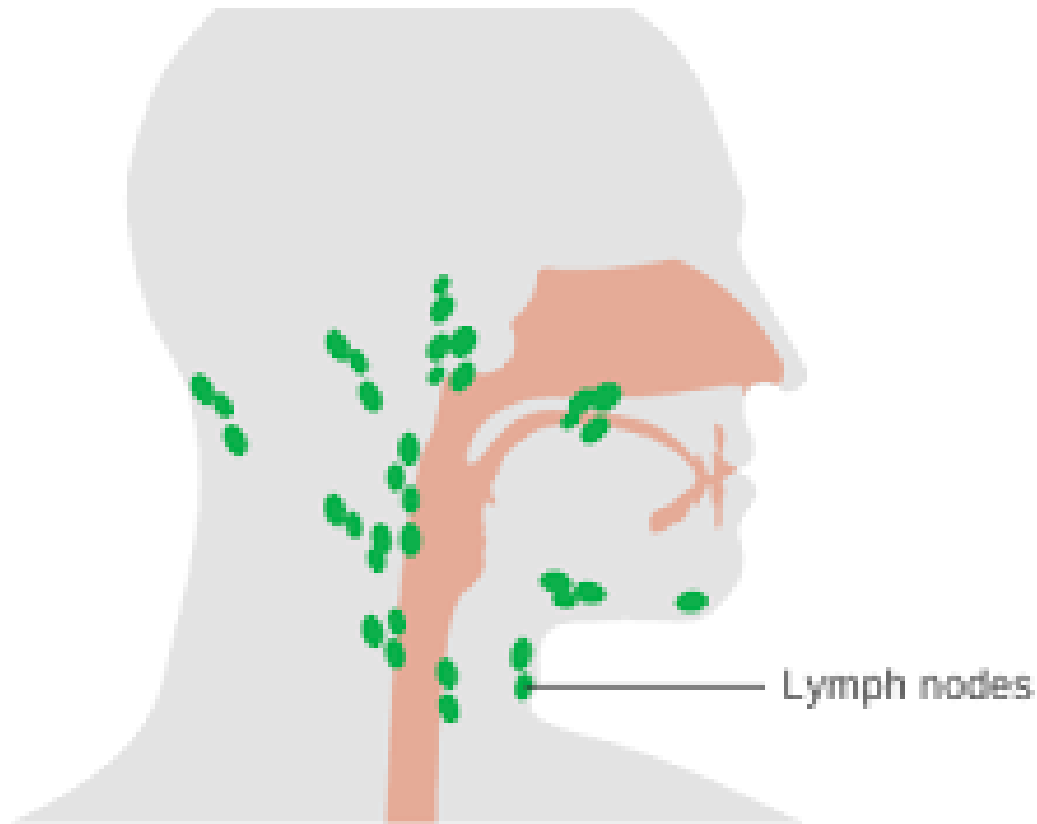
- Most common, image guided, No precautions after treatment-cannot transfer radiation to others

Internal or brachytherapy

- Delivers radiation from sources placed inside the body, sealed implants; precautions last a few days after, typically they must maintain one arms-length distance from others who spend more than 2 hours in any 24-hours period near them; sleep alone, limit contact with infants, children women who are pregnant and pets; flush the toilet twice after each use, use separate utensils and towels; and no kissing or sexual contact for at least 1 week.

Systemic

- Delivered through a radioactive substance that is swallowed or injected. Precautions are as above but may last longer.



Co-Morbidities of Radiation Therapy Relating to Rehab

Depends on the location
the radiation was
administered

- Radiation fibrosis
- Fatigue
- Lymphedema
- Difficulty swallowing

Chemo Therapy



Toxicity has improved dramatically.



Chemo doesn't know good cells from bad, cancerous cells divide more rapidly than normal cells, chemo destroys a >percentage of cancerous cells than normal cells.



Usually administered on an outpatient basis



Chemo Therapy



LONGER
SURVIVAL OF
PATIENTS WITH
CANCER HAS LED
TO AN INCREASE
IN THE CHRONIC
LONG-TERM
TOXICITIES
ASSOCIATED WITH
CHEMOTHERAPY



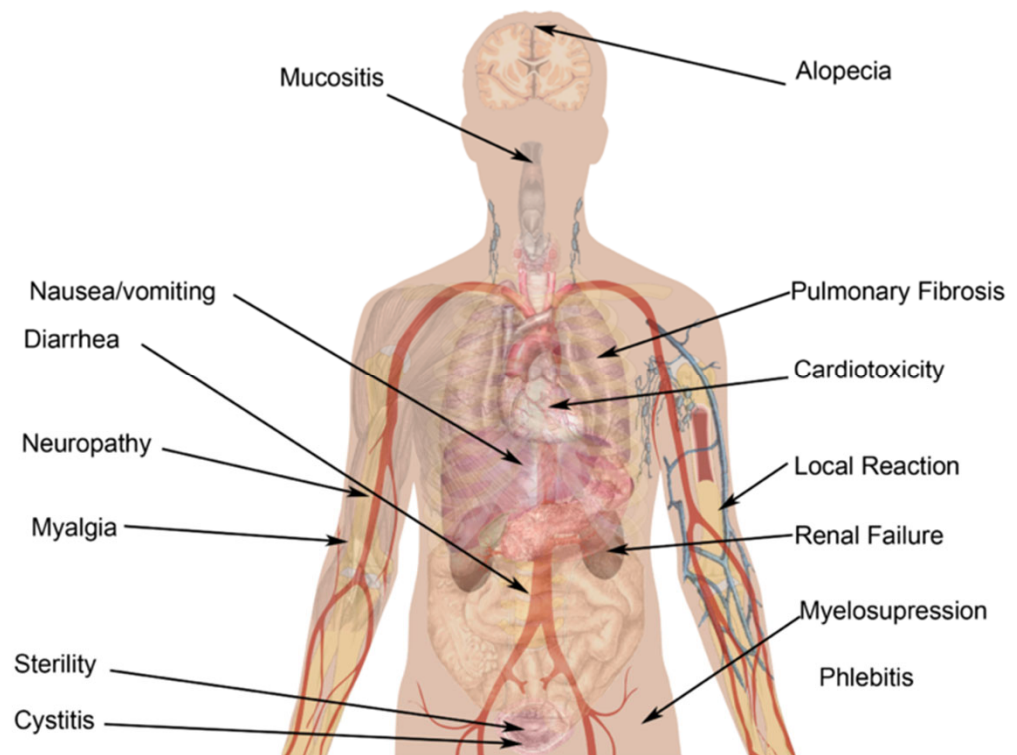
THIS SPECIALTY
AREA IS
INCREASINGLY
FOCUSED ON
PROBLEMS OF
CANCER
SURVIVORS
VERSUS THOSE
ACTIVELY GOING
THROUGH
TREATMENT



B/C OF THE BLOOD
BRAIN BARRIER,
CHEMO IS UNABLE
TO REACH THE BRAIN
AND SPINAL CORD IN
ADEQUATE
CONCENTRATIONS
DUE TO THE
NETWORK OF BLOOD
VESSEL WALLS THAT
PROTECT THE CNS
FROM VIRUSES AND
TOXINS IN THE
BLOODSTREAM.

Co-Morbidities of Chemotherapy Relating to Rehab

- Fatigue
- Cognitive changes, “chemo brain”
- Sexual dysfunction
- Infections
- Appetite
 - Taste changes
 - Swallowing
 - caloric deficits
- Hair loss



Cold Cap Therapy

Tightly fitting, strap-on, helmet-type hats filled with a gel coolant that's chilled to between -15 to -40 degrees Fahrenheit. These caps and scalp cooling systems may help some keep some or quite a bit of their hair during chemotherapy.



Works by narrowing the blood vessels beneath the scalp, reducing the amount of chemotherapy medicine that reaches the hair follicles. With less chemotherapy medicine in the follicles, the hair may be less likely to fall out. The cold also decreases the activity of the hair follicles, which slows down cell division and makes the follicles less affected by the chemotherapy medicine.

Cold Cap Therapy

\$3k not typically covered by insurance.

DEAR MAYO CLINIC: How effective is cold cap therapy in preventing hair loss in people undergoing chemotherapy treatments? Are there any risks?

ANSWER: Using a cold cap can significantly reduce hair loss caused by chemotherapy. Although some minor side effects may occur, no serious side effects have been associated with cold caps. Some have questioned whether cold caps might prevent chemotherapy from reaching cancer cells in the scalp. But that risk appears to be low.



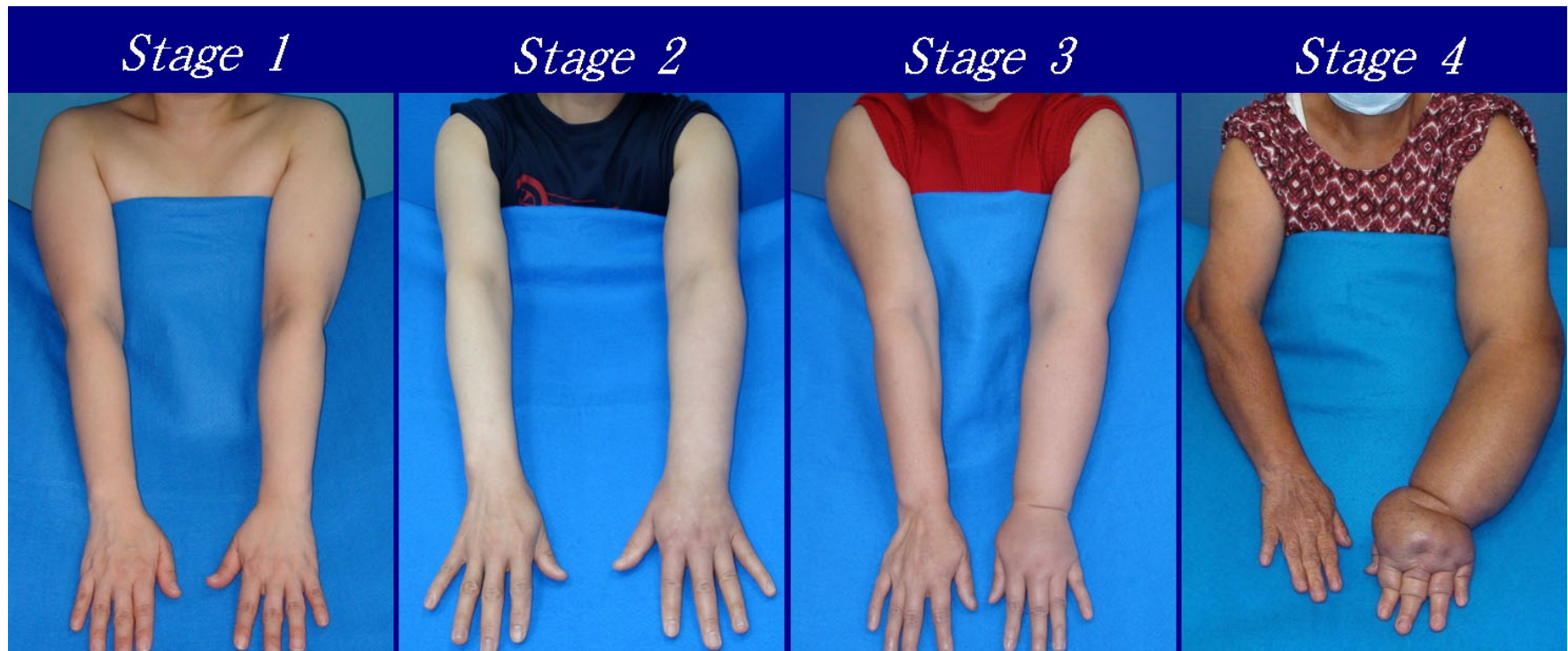


Surgery

- Surgery is the removal of the **tumor** and surrounding tissue during an operation by the surgical oncologist.
- Surgery is the oldest type of cancer therapy and **remains** an effective treatment for many types of cancer today.
- Most used and most curative.

Co-Morbidities of Surgery Relating to Rehab

- Pain, Fatigue, Lymphedema
- Body image dysfunction, Sexual dysfunction
- Damage to nerve and muscle tissue
- Loss of function after amputation
- Scar tissue issues such as axillary web syndrome/cording in breast cancer or joint limitations

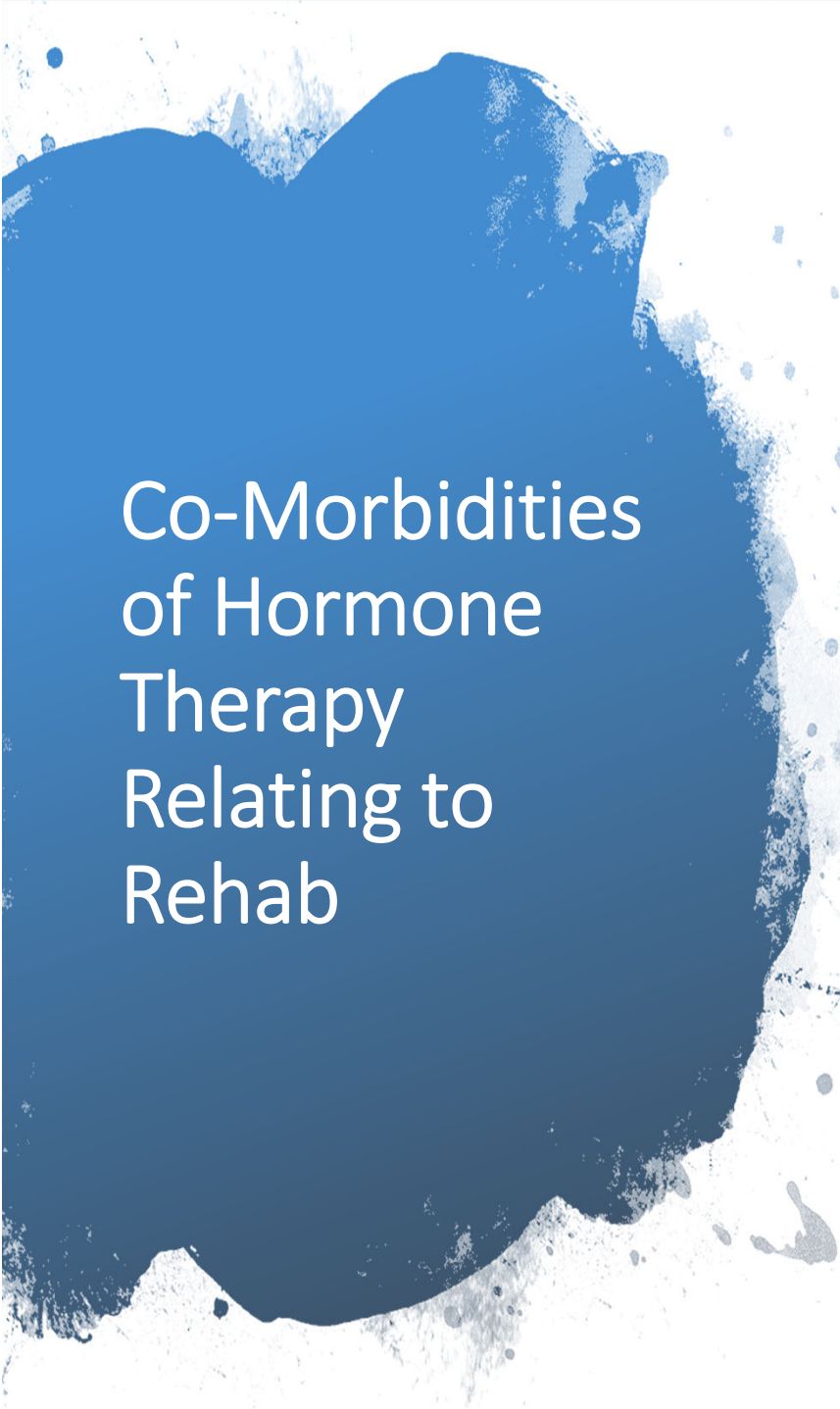


Hormone Therapy

Some hormones encourage the growth of some cancers, such as breast and prostate. But, in some cases, they may kill, slow or stop cancer cells from growing.

Hormone therapy usually involves taking medications that prevent cancer cells from getting the hormones they need to grow.

Often used as means to decrease risk of recurrence.



Co-Morbidities of Hormone Therapy Relating to Rehab

Side Effects:

- Hot flashes
- Night sweats
- Vaginal dryness
- Joint pain
- Bone loss
- Osteoporosis

Less Common Side-Effects:

- Blood clots
- PE
- Stroke
- Heart disease
- Dementia
- Loss of libido
- Erectile dysfunction
- Weight gain
- Cognitive changes

Immunotherapy



Immunotherapy is the "treatment of disease by inducing, enhancing, or suppressing an immune response."



Cancer cells mutate to evade the immune system. **Immunotherapy drugs are designed to alert the immune system about these mutated cells so it can locate and destroy**



Co-Morbidities of Immunotherapy Relating to Rehab

- Side-effects that mimic the flu
- Fatigue

Anti-Angiogenesis (Angiogenesis Inhibitors) Therapy

Angiogenesis (growth of new blood vessels) plays a critical role in the growth and spread of cancer. A blood supply is necessary for tumors to grow beyond a few millimeters in size.

Anti angiogenic drugs are treatments that stop tumors from growing their own blood vessels. If the drug is able to stop a cancer from growing blood vessels, it might slow the growth of the cancer or sometimes shrink it.

The resulting new blood vessels “feed” growing tumors with oxygen and nutrients, allowing the cancer cells to invade nearby tissue, to move throughout the body, and to form new colonies of cancer cells, called metastases.

Co-Morbidities of Anti-Angiogenesis

- Clots in the arteries with resultant stroke or heart attack
- Hypertension
- It is likely that some of the possible complications of angiogenesis inhibitor therapy remain unknown. As more patients are treated with these agents, doctors will learn more about possible rare side effects.

**Special
Considerations
Apply Across all
Cancer Types
and Throughout
Cancer
Continuum**



Cardiotoxicity



Metastatic Bone Disease



Psychosocial
Disruption

What about
“burn-out” for
the therapy
practitioners?
Burn-out versus
moral injury?



Sexuality and Intimacy

Cardiotoxicity

Damage of the heart muscle or electrophysiology from harmful chemicals used in cancer treatments

Can lead to cardiomyopathy, ranging from subclinical myocardial dysfunction to irreversible heart failure.

Report the following changes to physician immediately:

- Fluid retention; swollen legs, feet, and/or ankles
- Complaints of feeling bloated
- Complaints of coughing spells or chronic cough
- Trouble lying flat or complaints of SOB
- Feeling overly tired or fatigue that hasn't been consistent

Metastatic Bone Disease

Pain, pathological fractures

Other indicators include urinary or bowel incontinence

Lung, breast, prostate, kidney and thyroid cancers are more prone to metastasize to bone

Most common in the spine, pelvis, femur followed by humerus and ribs

Therapists must remain vigilant of new complaints of pain, particularly during weight-bearing and report to oncologist immediately.

Psychosocial Disruption

Can begin at dx with fear, anxiety, despair, sadness, changes in personal beliefs, emotions, and moods

Can affect interaction with family and social supports

Therapists must recognize when changes are interfering with relationships and the patients ability to engage in daily activities and maintain roles, life balance.

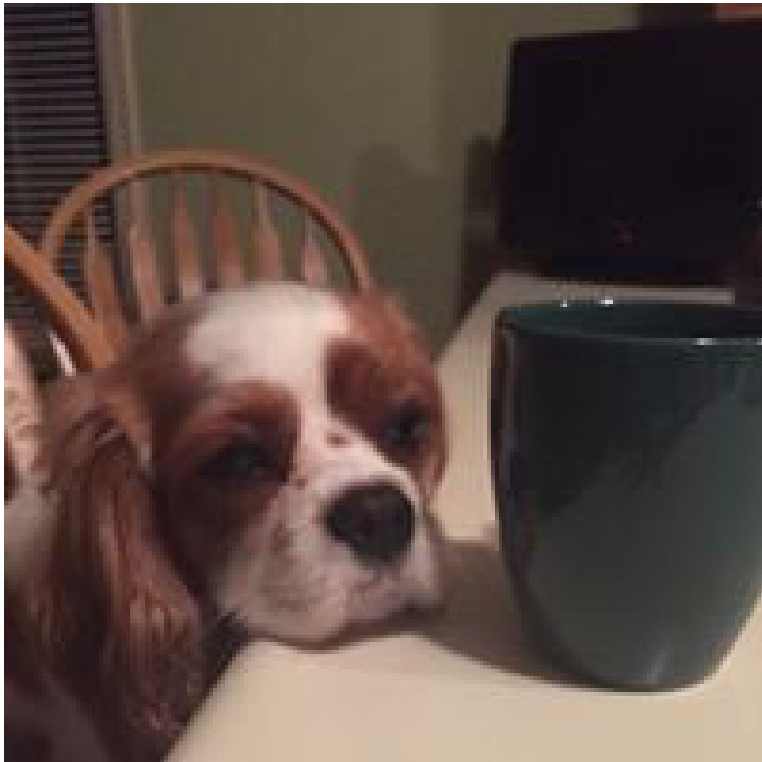
Know when and who to refer to if needed.

Sexuality and Intimacy

Upwards of 59% of women and 79% of men reported cessation or decreased frequency of sex and intimacy after cancer treatments.

Reasons include: Body image concerns, Hormonal changes, Changes in partners image of the survivors body

Education should include: Physical considerations, precautions, positioning, protection of surgical areas.



Need a
Coffee
Break?

Prostate

Most men of the age of 50 will have some experience with prostate disease.

Prostate cancer is the most frequently diagnosed cancer in men aside from skin cancer (ACS).

If a man has a father or brother with the disease, his risk for developing it is twice that of a man with no family history.

Referred to as an indolent cancer, one that grows extremely slowly.

Median age of diagnosis is 72.

Prostate Procedures Minimally Invasive Surgery



Incision into abdominal wall



Less blood loss



Less pain



Shorter recover



Quicker hospital discharge (65% discharged the day after surgery, 30% in two days)



Quicker return to activity and work (usually 3 weeks)



Better cosmetic result (4-5 tiny incisions versus 8" or larger from open surgery)



90% Foley catheter removed in one week, with open surgery 2-3 week placement

Radical Prostatectomy

- Surgical removal of the prostate, the surrounding tissue, and seminal vessels
- Side-Effects
 - 65-90% impotence rate
 - Shortening of the penis by 1-2 cm
 - Bladder spasms
 - Heart attack
 - Stroke
 - Blood clots in the legs
 - 1 in 20 are left without urinary control
 - Most can expect to be incontinent for 3-4 months after sx
 - Infertility
 - Inguinal hernia
 - 1 in 5 contend with long-term stress incontinence

Pelvic Lymph Node Dissection

Or pelvic lymphadenectomy

Side-Effects:

- Lower extremity lymphedema
- Infection

Transurethral Resection of the Prostate (TURP)

Surgical removal of the prostatic tissue to relieve symptoms.

Side Effects

- 1 in 10 men will experience partial impotence or incontinence.
- Recurring urinary tract infections.
- 9 in 10 men will experience retrograde ejaculation.
- Difficulty urinating – may last several months.
- Bloody urine after surgery.

Bi-lateral Orchiectomy

The surgical removal of the testicles, through a small incision in front of the scrotum.

Side Effects

- Hot flashes or flushing
- Decreased sexual desire
- Fatigue
- Weight gain
- Potential impotence
- Breast tenderness or growth
- Osteoporosis and reduction of muscle

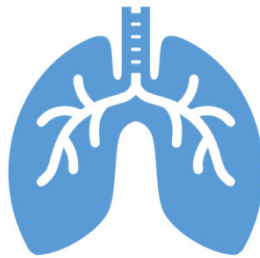
Cancer of the Lung

Lung cancer is by far the leading cause of death from cancer.

Tobacco use is to blame for 85% of all lung cancers.

The other 15% arise mainly from occupational and environmental exposures to radon, asbestos and second-hand cigarette smoke.

Side Effects of Lung Cancer Surgery



- Pneumothorax (collapse of the lung)
- Air leaks
- Infection, Bleeding
- Intense postoperative pain that can lead to thoracotomy pain syndrome
- Respiratory failure
- Damage to near by structures such as the heart
- Hemothorax (a condition that results from blood accumulating in the pleural cavity.)

Types of Treatment



CHEMOTHERAPY



EXTERNAL
BEAM
RADIATION



TARGETED
THERAPY



LASER THERAPY



PHOTODYNAMIC
THERAPY (PDT)



CRYOSURGERY

Cancer of the Colon/Rectum

Colon cancer is the **third most common cancer in both men and women.**

Colon and rectal cancer begins in the digestive system. Colorectal cancer refers to cancer in the large intestine.

Potential Side Effects of Colorectal Surgery

Bleeding

Blood clots in the legs

Damage to nearby organs during the operation

Bowel-blocking adhesions

Erectile dysfunction

Reduced sexual pleasure

Abdominal adhesions=pain during intercourse for women

Infertility

Infection at stoma site

Types of Treatment Used

Chemotherapy

Target therapy

Radiofrequency ablation

Ethanol (alcohol) ablation

Cryosurgery

Hepatic artery embolization

Cancer of the Bladder

Bladder cancer is one of the most common cancers, affecting approximately 68,000 adults in the US each year.

Men are 4x more likely to develop bladder cancer than women.

The most common symptom is blood in the urine, increased frequency to urinate, and pain or feeling of irritation while urinating.

Most can be treated without having to remove the bladder, and the five year survival rate approaches 95%.

Potential Side Effects of all Cystectomies

Lower extremity lymphedema

Blood clots

Wound infection

Pouch stones

Risk of excessive bleeding, urinary tract infections, urine leakage, and blockage of urine flow.

Potential Side Effects for Urostomy Procedures

Wounds infections

Infections at stoma site

Incontinence

Pouch stones

Blockage of urine flow

Pouch leak

Cancer of the Kidney

Early stage kidney cancer usually has no symptoms, but as the tumor grows there may be blood in the urine, a pain or lump in the lower back or abdomen, fatigue, weight loss, fever, or swelling in the legs and ankles.

As with many cancers tobacco use is a strong risk factor. 30% of kidney cancer cases may be attributed to obesity.

In addition high blood pressure, chronic renal failure, and occupational exposure to certain chemicals increase the risk. A small percent of renal cell cancers are hereditary.

Potential Side Effects of Nephrectomies

Numbness at incision site

Bleeding during or after surgery that may require blood transfusions

Infection

Damage to the spleen, pancreas, liver, aorta, vena cava, and large or small bowel

Pneumothorax (unwanted air in chest cavity)

Incisional hernia

Leakage of urine into the abdomen

Temporary or permanent renal failure

Lower extremity lymphedema

Procedures

Distal pancreatectomy- surgical removal of the body and tail of the pancreas and usually the spleen.

Side effects

- Pancreatic enzyme insufficiency
- Diabetes
- 10-15 pound weight loss
- Leakage of pancreatic juices
- Immunocompromising and overwhelming post-splenectomy infections
- Post-operatives bleeding

Procedures

Total pancreatectomy- surgical removal of the entire pancreas as well as the spleen, and most of the adjacent lymph nodes.

Side effects

- Fistula (leak) can potentially occur as a result of the failure of sutures to seal the new connection.
- Post-operative bleeding
- Delayed gastric emptying
- Pancreatic anastomotic leak
- Lower extremity lymphedema
- Insulin dependence
- Cramping and diarrhea
- Weight loss of 10-15 pounds
- Osteopenia, Liver disease
- Immunocomprominization and overwhelming post-splenectomy infections

Cancer of the Cervix

Cervical cancer can often be successfully treated when found early.

Most cervical cancer is caused by a virus human papillomavirus (HPV). You can get HPV through sexual contact.

Not all types of HPV cause cervical cancer. Some cause genital warts, but other types may not cause symptoms.

You can have HPV for years and not know it. It stays in your body and can lead to cervical cancer years after you have been infected.

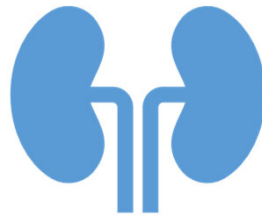
Uterus (Endometrium) Cancer

Endometrial carcinoma is the third most common malignancy among women; however it has one of the highest cure rates.

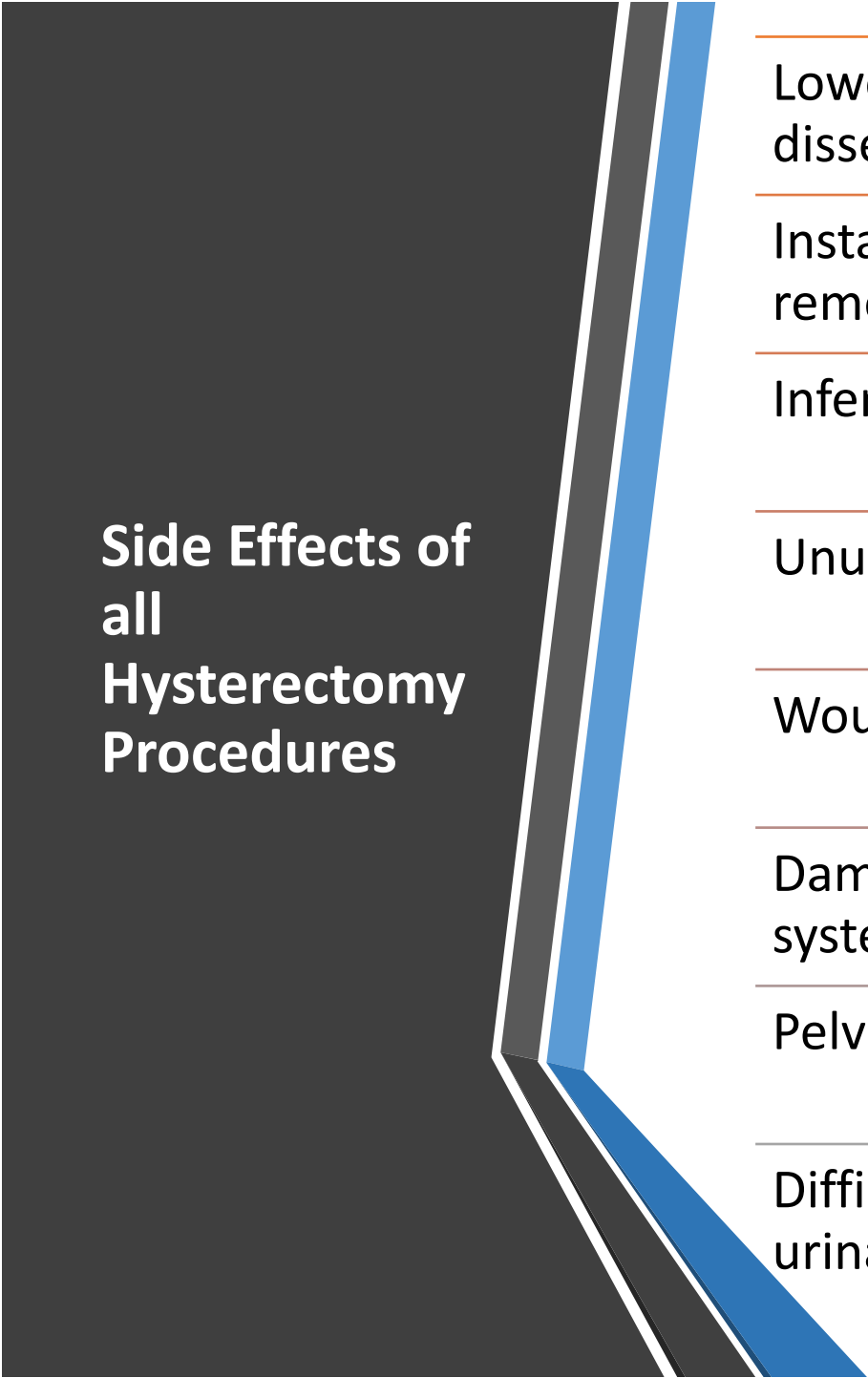
Unlike cervical cancer, there is no noninvasive stage with endometrial cancer. In atypical uterine hyperplasia, normal endometrial cells multiply out of control until they build up and cause the uterine wall to thicken.

Common symptoms are abnormal bleeding, especially in postmenopausal women. Pain during urination, intercourse, or in the pelvic area.

Cancer of the Ovaries



- Usually by the time ovarian cancer is detected, it has spread to the other organs within the pelvis.
- Incidence rate has slowly been decreasing at a rate of about 0.9% per year since the mid-1980's. Ovarian cancer accounts for about 5% of cancer deaths for women and causes more deaths than any other female reproductive cancer.
- Ovarian tumors are never biopsied with a needle, or cut into, because doing so could allow cancerous cells to escape.



Side Effects of all Hysterectomy Procedures

Lower extremity lymphedema (if
dissection was performed)

Instant menopause if ovaries were
removed

Infertility

Unusual bleeding

Wound infection

Damage to the urinary and intestinal
systems

Pelvic pain

Difficulty with bowel movements and
urination

Cancer of the Stomach

The incidence of stomach cancer has gone down 75% since the 1930's.



There is a sharp increase in stomach cancer rates in people over the age of 50.



Most people diagnosed with stomach cancer are between their late 60s and 80s.



An increased risk of stomach cancer is seen in diets with large amounts of smoked foods, salted fish and meat, and pickled vegetables.

Cancer of the Liver

Liver cancer rates are about three times higher in men than in women.

Symptoms may included abdominal pain/swelling, weight loss, weakness, loss of appetite, jaundice, and fever.

The majority of liver cancers are due to alcohol related cirrhosis, and possibly non- alcoholic fatty liver disease associated with obesity, diabetes, and metabolic related disorders.

Liver Tumors are Classified in One Of Four Ways

Localized and operable tumors are found in one place and can be removed.

Localized and inoperable tumors are found in one area but cannot be totally removed safely.

In advanced cases, cancer has spread throughout the liver and/or to the other parts of the body.

In recurrent cases, the cancer has returned to the liver or another part of the body after initial treatment.

Side Effects

Bleeding problems

Infection

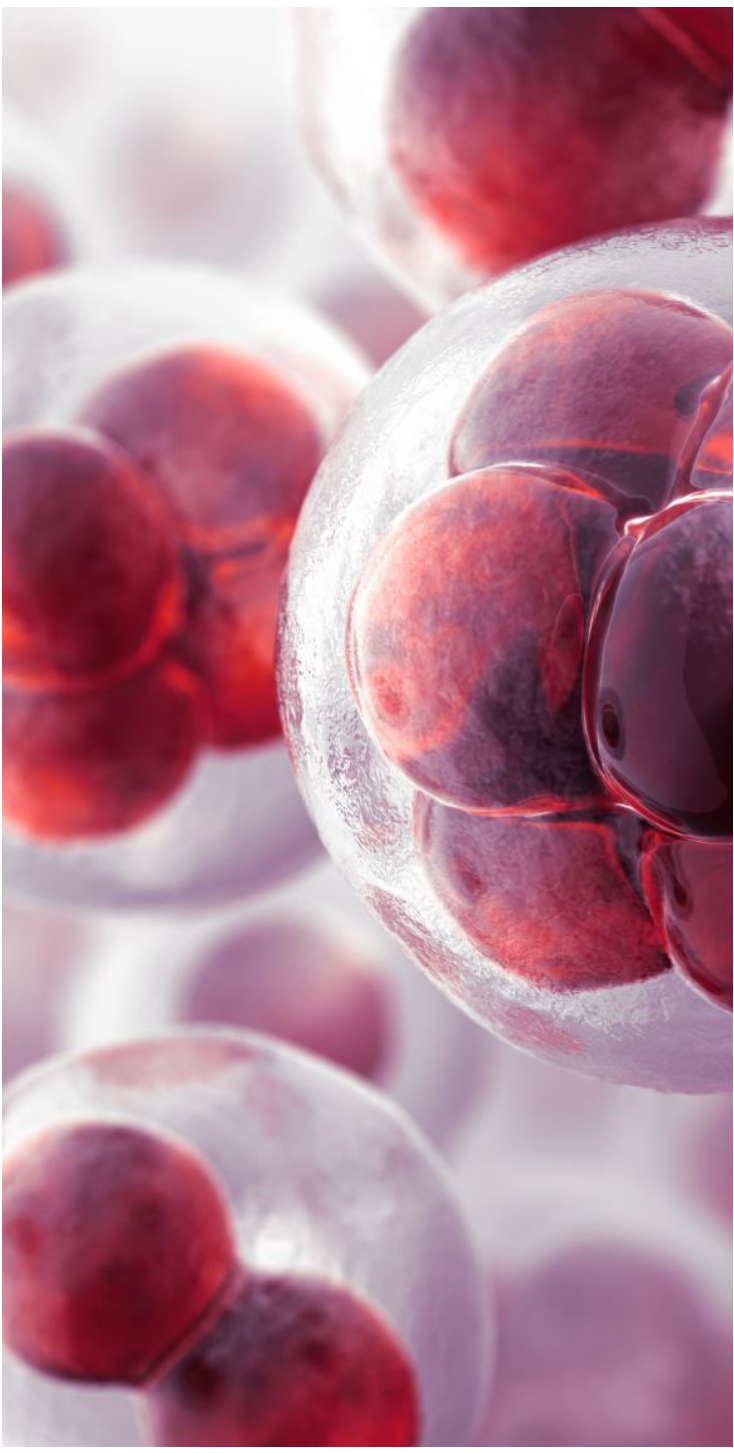
Pneumonia

Blood clots

New liver cancer

Transplant failure

Side effects from immunosuppressant drugs (with transplant). After transplant patients will be taking 7-10 different medications.

A close-up, microscopic view of several red blood cells. The cells are spherical and have a reddish-pink hue, with some showing a lighter, translucent center. They are clustered together, with some in sharp focus and others blurred in the background.

Cancer of the Brain

- Half of all brain tumors are benign.
- The best known environmental risk factor for brain tumors is radiation.

These tumors usually occur 10 to 15 years later after the radiation.
- Neurofibromatosis type 1 (NF1) is a genetic disorder, and is the most common syndrome linked to brain or spinal cord tumors.
- Neurofibromatosis type 2 (NF2) less common than NF1, which almost always occurs on both sides of the head.
- It is also linked with an increased risk to meningiomas or spinal cord ependymomas.

Types of Brain Tumors

Gliomas- makes up about half of all brain tumors. These tumors originate in the glial cells that form the supportive tissue of the CNS.

Astrocytoma- the most common form of adult brain tumors. They take place in the star-shaped glial cells called astrocytes.

Brain-stem gliomas- only represent 5% of all adult brain tumors. They are usually made up of astrocytes, but can contain other types of cells as well.

Ependymomas- occur in the ependymal cells found in the lining of the brains hollow cavities and the central canal of the spinal cord. 85% of these tumors are benign.

Types of Brain Cancer

Oligodendrogliomas- these tumors form in the oligodendrocytes, another type of glial cell that transmits nerve impulses. These cells grow so slowly that they may not be detected for years.

Mixed gliomas- these contain two or more types of glial cells. The oligo cell is more promising as far as a better outcome because it is highly sensitive to chemotherapy.

Meningiomas- comprise about one in five brain tumors. They materialize in the meningeal membrane that covers the brain and the spinal cord. 95% of these tumors are benign. Once they are removed they rarely reoccur.

Types of Brain Cancer

Craniopharyngioma- a benign tumor that occurs most often in children and adolescents than in adults. It develops near the optic nerve and the pituitary gland. It may bring on visual impairment and hormonal imbalances. It may effect the hypothalamus, the part of the brain that regulates temperature, hunger, and thirst.

Adult pineal parenchymal tumors- tumors in this region may be difficult to access surgically because they are deep within the brain. There are several types of cancers found near the pineal gland and they can either be aggressive or very responsive to treatment.

Side Effects of all Procedures



- Damage to normal brain tissue
- Swelling of the brain
- Loss of brain function
- Bleeding
- Infections
- Weakness
- Coordination problems
- Personality changes
- Difficulty in speaking and thinking
- Seizures

Cancer of the Testicle

- Cancer of the testicles is one of the leading malignances among men aged 20-44
- One main risk factor is a condition called *cryptorchidism*, or undescended testicles.
- Testicular cancer is one of the most curable forms of cancer if treated appropriately. Even when the tumor has metastasized , 75% of patients can be cured.
- Symptoms of testicular cancer may be a lump in the testicle, painless enlargement of the testicle, dull ache in the lower abdomen or groin, heaviness in the scrotum.

Potential Procedure Side Effects

Decreased sex drive

Infertility

Impotence

Fatigue

Hot flashes

Loss of lean muscle mass

Change of physical appearance

Lower extremity and lymphedema of the torso

Retrograde ejaculation

Infection

Bowel obstruction

▼ Cancer of the Small Intestine

- Cancers found in the small intestine are adenocarcinoma, sarcoma, carcinoid, tumors, gastrointestinal stromal tumor, and lymphoma.
- Small intestinal adenocarcinoma occurs slightly more often in men than in women
- Survivors of colon cancer have an increased risk of getting cancer of the small intestine.
- Crohns disease attacks the gastrointestinal (GI) tract and can affect any part of the GI tract, but most often affects the lower part of the small intestine.
- People with inherited conditions have a higher risk of small intestine adenocarcinoma.

Side Effects of a Small Bowel Resection

Lower extremity lymphedema

Incisional hernia

Narrowing of the stoma opening

Infection at the stoma site

Blockage of the intestine from scar tissue

Side Effects of the Whipple Procedure

Delayed gastric emptying

Possibility of developing diabetes, or worsening diabetes

Leaking from the various “connections”

Infection

Bleeding

Temporary weight loss

Stomach may be paralyzed up to 4-6 weeks after surgery- may require feeding tube

Types of Breast Cancer

Triple Negative

Medullary Carcinoma

Tubular Carcinoma

Mucinous Carcinoma

Paget's Disease

Phyllodes Tumors

Invasive Ductal Carcinomas

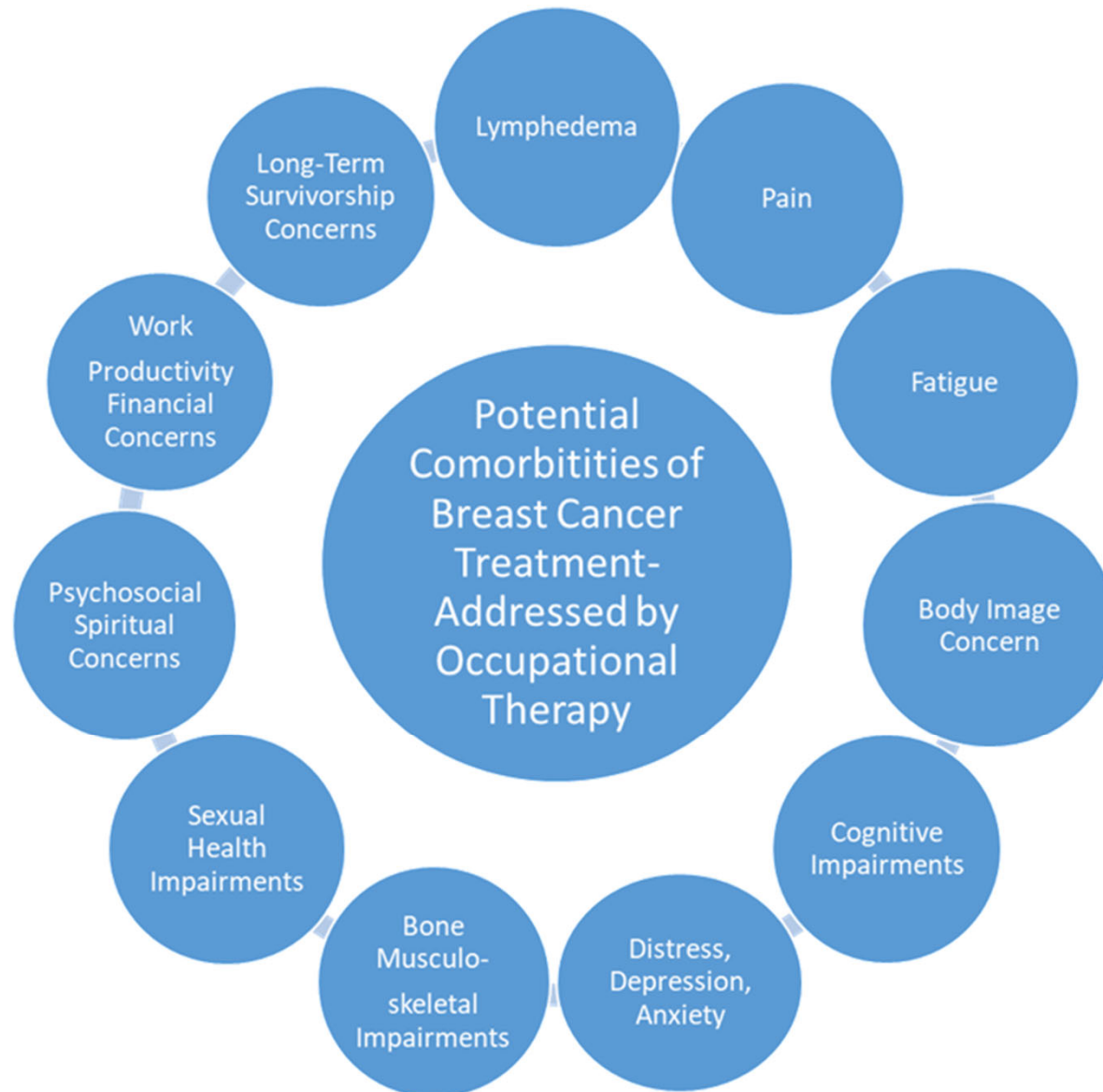
Invasive Lobular Carcinomas

Invasive Mammary Carcinoma

Inflammatory Breast Cancer

Metaplastic Breast Cancer

**Did we miss
some
comorbidities?**



An abstract orange splash graphic with a textured, watercolor-like appearance, featuring various shades of orange and some darker spots, extending from the top left towards the center of the slide.

So What's The Issue?

- Treatments often **cure cancer but leave behind co-morbidities** that can last a lifetime.
- Morbidity-Living; Mortality-Death
- **Cancer is a chronic disease**-but our current medical model does not treat it that way.
- Many of cancer's co-morbidities can be prevented through "**pre-hab**" but we aren't a part of the team. Why? We can improve lives and decrease medical costs, but we aren't at the table! Why?

COSTS

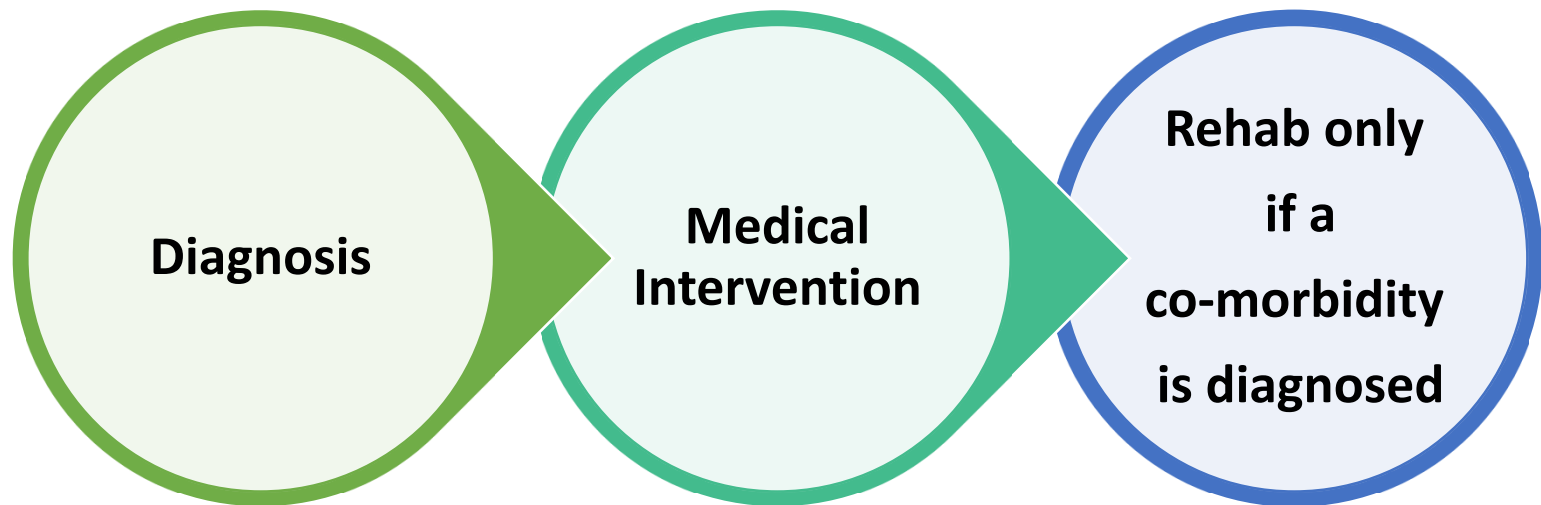
- Direct costs-medical care
- Indirect costs-decreased work productivity, less consumer buying, earning, etc.
- \$274 BILLION a year-direct and indirect costs combined.

So What's the Issue?

Vast majority of survivors are receiving cancer treatment in their own community hospitals, **is your hospital or clinic prepared** to provide pre-hab? Oncology rehab? Long-term survivorship?

Are you prepared to treat individuals with a history of cancer? YOU will see cancer in all areas of practice...cancer survivors have hip replacements, strokes, other diseases and aging disabilities too!

Current Medical Model-Reactive



**American
College of
Surgeons-2020
Standards-
Includes
“Rehabilitation
Care Services”**

See blog for full standards.

**Definition and
Requirements:**

- “The availability of rehabilitation care services is an essential component of comprehensive cancer care, beginning at the time of diagnosis and being continuously available throughout treatment, surveillance, and, when applicable through end of life.

**Breast cancer 2019:
'Prehab' can help reduce odds of painful lymphedema
By Cindy O. Herman
For The Daily Item
Oct 29, 2019**

- Kathy Bates, “When I get on a plane, I have to wear my compression sleeves,” she said. “I can’t lift heavy things, I can’t go into hot water because putting heat on it makes it swell, but cold isn’t good because it constricts everything.”
- “The doctor told Kathy Bates, ‘Just be glad you’re alive,’” Turner said, anger showing in his expression.

Breast cancer 2019 Continued:

- “Lymphedema penetrates every part of life. It’s a miserable, miserable condition,” said John F. Turner, MD, FACS, Medical Director of the Thyra M. Humphreys Center for Breast Health at Evangelical Community Hospital. “To me, after local recurrence or metastatic disease, it is the third worst problem that occurs after breast cancer treatment.” It’s also been one of the most neglected areas of breast cancer care.
- “One of the biggest things we have done in the area of lymphedema prevention is prehab,” Turner said. The opposite of rehab, which occurs after an injury or surgery, prehab watches for a problem and treats it as early as possible.

Services Provided by One of the Top Cancer Centers: Memorial Sloan-Kettering in New York City:



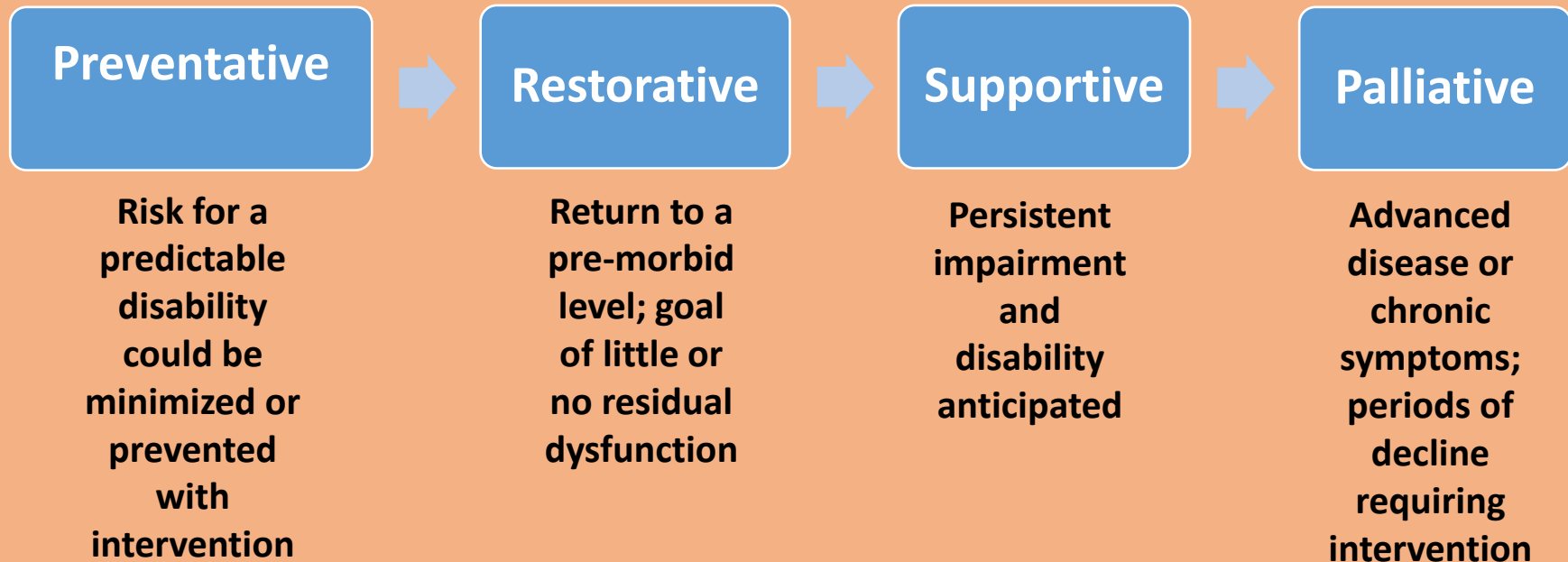
- rehabilitation and exercise
- palliative care and pain management
- counseling and support
- specialized programming for older adults
- an integrative medicine department that includes massage, acupuncture
- hypnotherapy, meditation, visualization, music therapy, and nutrition counseling
- dermatology and skincare
- sexual health
- fertility services
- tobacco treatment
- virtual library with a dedicated Web specialist
- clinical trials
- an entire department dedicated to patient and caregiver education



Current Status of Practice

- 32% of older adults with cancer receive OT within 2 years of diagnosis and this is due to a co-morbidity being diagnosed, not for preventative measures
- We need to change our thinking...lifespan model, not situational model...pre-hab

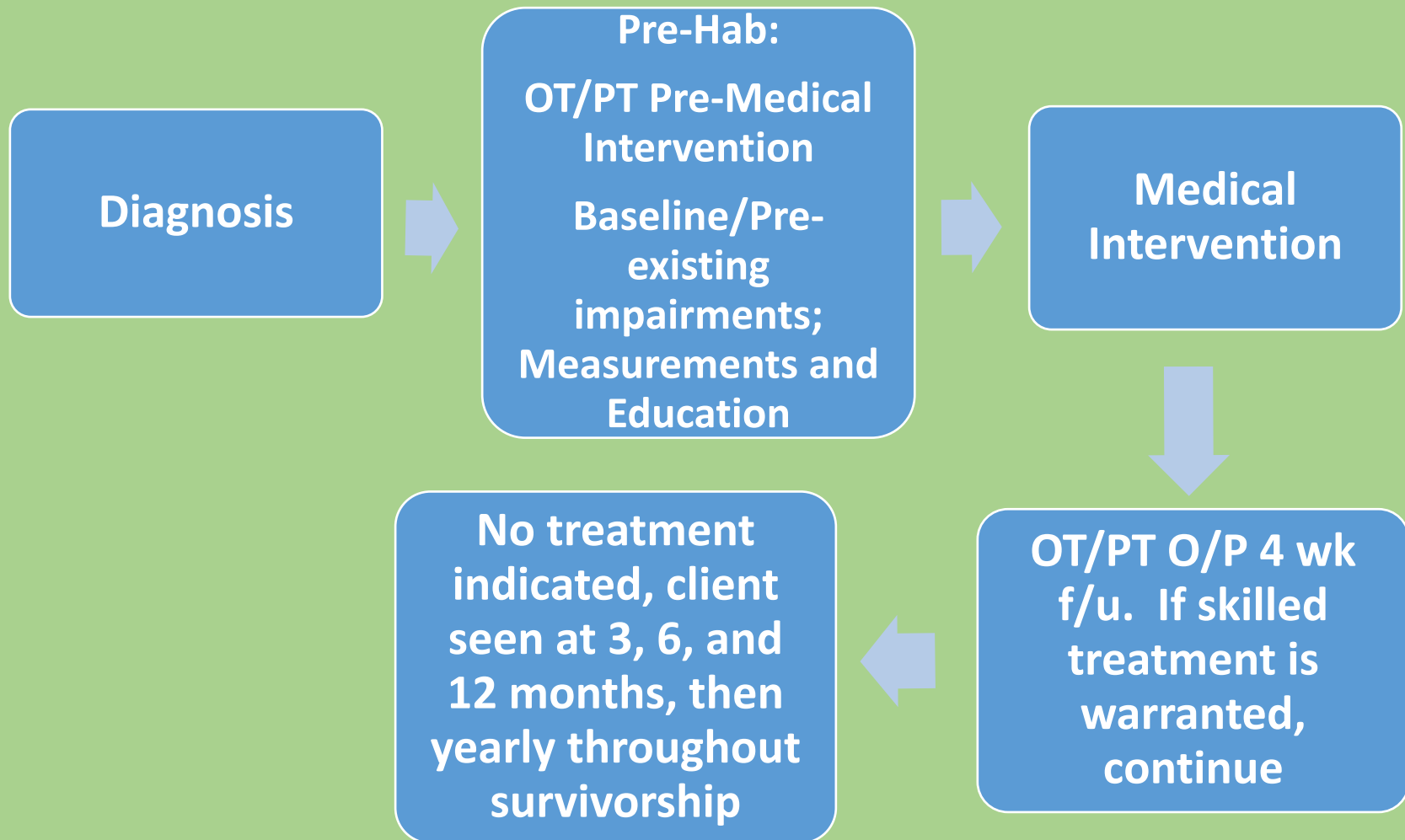
Phases of Oncology Rehabilitation



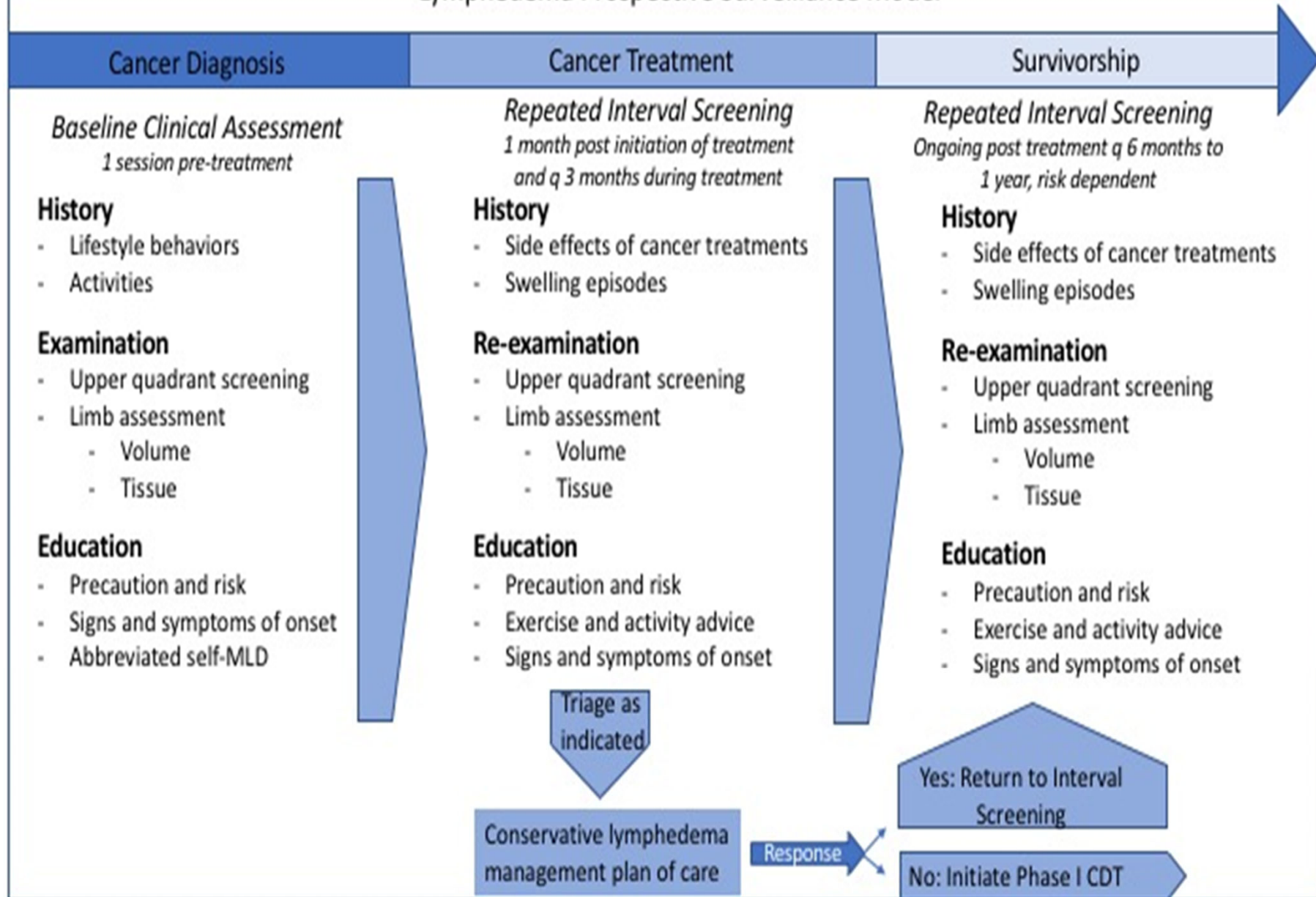
This “dated” slide is here to make the point that in 1981 “pre-hab” was studied, but implementation across the country remained limited

Dietz, 1981

Best-Practice=Protocol Driven Prehabilitation Prospective Surveillance Model-Proactive



Lymphedema Prospective Surveillance Model



Intervention Protocols With Cost Outline for Skilled Therapy and Durable Medical Equipment Costs With a 1-Year Timeline

Services and Supplies	Prospective Surveillance Model	Cost	Traditional Model	Cost
Skilled therapy	- All patients are seen for baseline (preoperative) and 1-, 3-, 6-, 9-, and 12-month postsurgery visits (6 visits) - Initial visit: coded as an evaluation (97001–1 visit) - Follow-up: coded as re-evaluation (97002–5 visits) Prospective surveillance model cost If lymphedema is diagnosed: - If greater than 3%–5% volume increase, a ready-made sleeve and gauntlet are issued for daily wear for 4 weeks - Patient returns in 4 weeks for follow-up (97002–1 visit) - If volume is reduced, continue surveillance schedule - Continue modified garment use - Replace garments in 6–9 months - If volume is not reduced, initiate decongestive therapy	\$69.29 \$185.75 \$255.04 \$37.15	If lymphedema is diagnosed: - Patient is referred by the medical provider for therapy - Initial visit: coded as an evaluation (97001–1 visit) - Decongestive therapy: 5 visits/week for 2 weeks then 3 visits/week for 1 week^a - Each visit is 1 hour in duration and requires one-to-one care (4 units of 97140 each visit for 13 visits) - At the completion of therapy, patient receives custom-made compression garments (sleeve and gauntlet) - One additional visit is undertaken 6 months later for renewal of garments (97002–1 visit)	\$69.29 \$1,388.48 \$37.15
Compression bandage supplies	None required	\$0	2 sets of bandages	\$230.00
Compression garment supplies	4 ready-made arm sleeves 4 ready-made hand gauntlets	\$344.00	4 custom-made arm sleeves 4 custom-made hand gloves	\$1,400.00
Prospective surveillance model cost		\$636.19	Traditional model cost	\$3,124.92

^a Average length of therapy frequency and duration.

Administrators as Part of the Team?

- Need their “buy-in”
- They need to understand why rehab is needed prior to any medical intervention---they need education!
- Remember they often think in numbers—show them the research

(see supplemental materials on the blog page)

- Rehab as cost-containment
- Decrease length of hospital stay
- Decrease readmission rates under 30 days

**Most importantly Pre-Hab and Oncology Rehab
is what is BEST for the patient!**

Physician's as Part of the Team?

- Need their “buy-in.”
- They need to understand why rehab is needed prior to any medical intervention---they need education!
- Remember they often think they “fix” the problem
show them the research **(see supplemental materials on blog page)**
 - Improves patient outcomes
 - Improves patient's quality of life

**Most importantly Pre-Hab and Oncology Rehab
is what is BEST for the patient!**

How Do We Get Paid For Pre-Op Evaluation?

Do they have a dx---yes

- Cancer Related Fatigue?

Counseling code?

I would bill an eval.

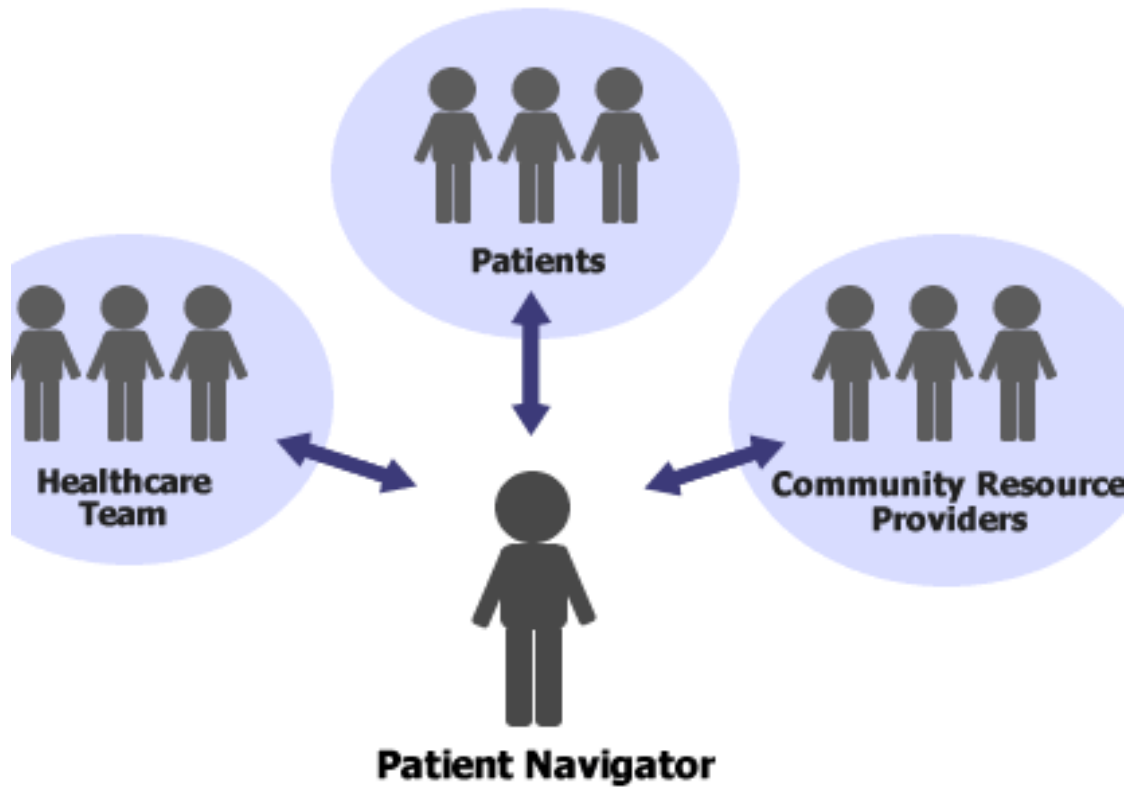
Speaking of Money...The Financial Burden Of Breast Cancer

- “Financial toxicity” — cost-related side effects borne by cancer patients, take a huge emotional, mental and physical toll, according to The Pink Fund, a nonprofit that provides financial assistance to breast cancer patients for non-medical, cost-of-living expenses.
- “The cost of treating breast cancer is higher than any other malignancy, according to the National Cancer Institute. In 2020, medical expenditures for breast cancer are projected to reach \$16.5 billion, more than colorectal cancer (\$14 billion), lymphoma (\$12 billion), lung cancer (\$12 billion) and prostate cancer (\$12 billion).”

Speaking of Money...The Financial Burden Of Breast Cancer

- “Breast cancer patients with lymphedema —had an average of \$2,306 in out-of-pocket costs per year, compared to \$1,090 for those without lymphedema. When productivity loss was included, lymphedema patients spent an average of \$3,325 per year in out-of-pocket costs, compared to \$2,792 for those without lymphedema.”
- Breast cancer patients who need financial help during their treatment [can apply to The Pink Fund](#).
- <https://www.forbes.com/sites/nextavenue/2020/01/21/the-financial-burden-of-breast-cancer/#6479c9a24d21>

Patient Navigator Relationships



Multidisciplinary Oncology Care Team

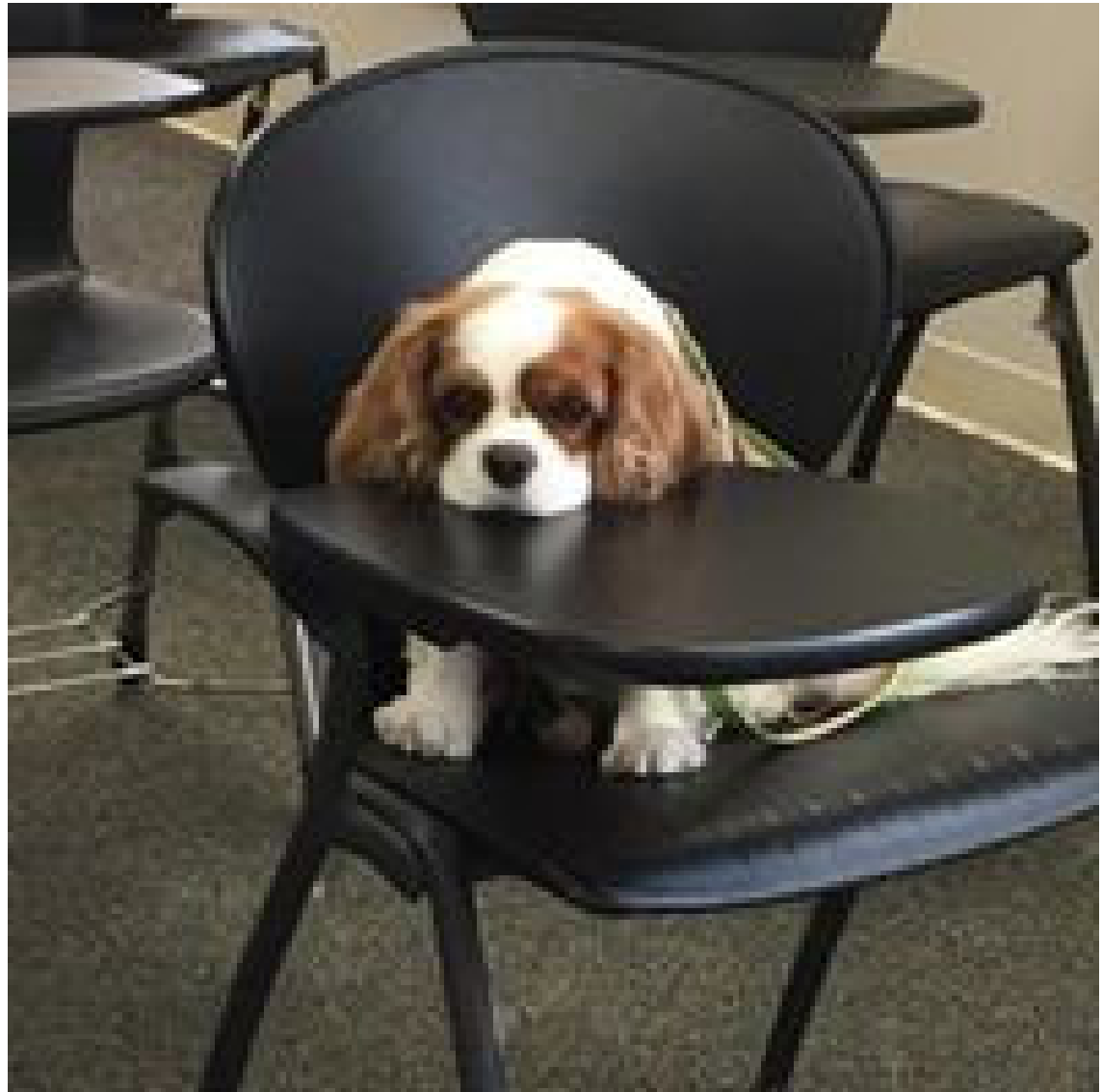
- **Patient Care Navigator**
- Radiologist
- Pathologist
- Surgical Oncologist
- Medical Oncologist
- Radiation Oncologist
- **Occupational Therapy**
- **Physical Therapy**
- **Speech Therapy**
- Social Worker
- Dietician
- Plastic Surgeon



N
C
C
N

- https://www.nccn.org/professionals/physician_gls/pdf/survivorship.pdf
- Can join for free
- Use these guidelines as triggers for rehab evaluations
- **See supplemental materials for example**

WAKE UP...
THE BEST
STUFF IS
COMING!





Treatment Interventions and Clinical Outcomes

Course Objective 1:
Strategies to develop, guide, and support a comprehensive cancer care rehabilitation program



Considerations for Treating Survivors

- May have limited prognosis
- Multiple medical comorbidities
- Severe pain
- Psychosocial distress
- Dynamic disease process
- Multiple side-effects
- Unique goals of care
- Requires a flexible treatment regimen!—Do you have a flexible productivity standard?

**Precautions
and
Contraindications
will be
covered
throughout
treatment
sections**



Treating During Active Cancer Treatments



The focus should be to maintain functional abilities.



There is a real risk of losing independence during cancer treatments.



Sessions should include

Education on the importance of staying active

Educating the patient about their precautions and possible side effects

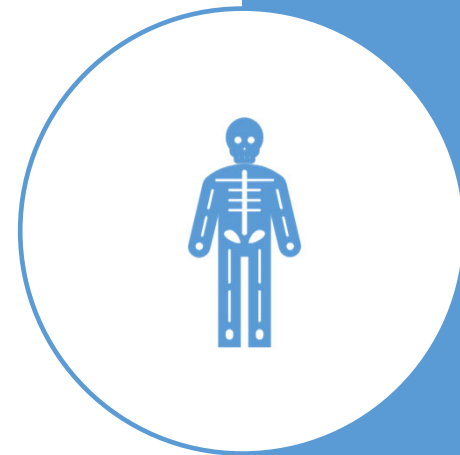
Energy conservation

Treating During Advanced Cancer

- Not everyone will win their battle against cancer, but these individuals will still benefit
- The focus should be
 - Adapted approaches to continue their meaningful life activities
 - Energy conservation
 - Education on how to complete tasks in an environment that has been modified
 - Family/caregiver training on safety and how to provide physical assistance

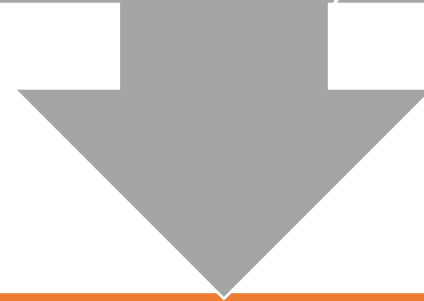
Exercise Prescription Considerations

- What types of cancer treatments have been completed, in-progress? Chemo? Radiation? Surgery? Lymph Node Removal? Risk of lymphedema?
 - Will there be further treatment, such as reconstruction?
 - Is muscle imbalance present? At risk?
 - ROM limitations present? At risk?
 - Weight management? Concern?
 - Compliance? Pain? Immunocompromised? Neuropathies?
- ❖ Exercise program goal: create a program with the proper prescription of stretching, strengthening, cardiorespiratory improvement that will be safe and effective, with proper progression/regression.



Comorbidities

The following comorbidities that rehab professionals are prepared to address are directly from the American Cancer Society and the American Society of Clinical Oncology breast cancer survivorship recommendations and guidelines (Runowicz et al., 2016).



Ideally addressing these in a pre-hab format is preferred.



Cancer and Lymphedema

Discussion time!

- Who should be treating lymphedema?
- Who should not be treating lymphedema?
- Should we be calling it lymphedema or lymphopathy?

Lymphedema is a Growing Problem in Cancer Survivorship

1 in 3 will develop lymphedema

Lymphedema is the leading post-surgical complication for many cancers

Lymphedema is the most feared consequence of cancer survivorship

Annual cost of cancer-related lymphedema: Estimated 7 **billion**

**Lymphedema
is NOT only an
issue with
breast cancer!**

If lymph nodes are dissected...there is risk

Is radiation was administered...there is risk

Individuals of advanced age...there is risk

Sustained an infection...there is risk

If surgery...there is risk

If obesity is present...there is risk

Are you prepared to identified risks,
needs, treat?

Lymphedema



- How do we know when it is lymphedema or another form of swelling?
- How do we know when we can treat it or if treatment is contraindicated?
- How do we know when we are in over our heads!

These are great questions and support my belief that individuals with lymphedema should be treated by healthcare practitioners who are certified in the treatment of lymphedema.

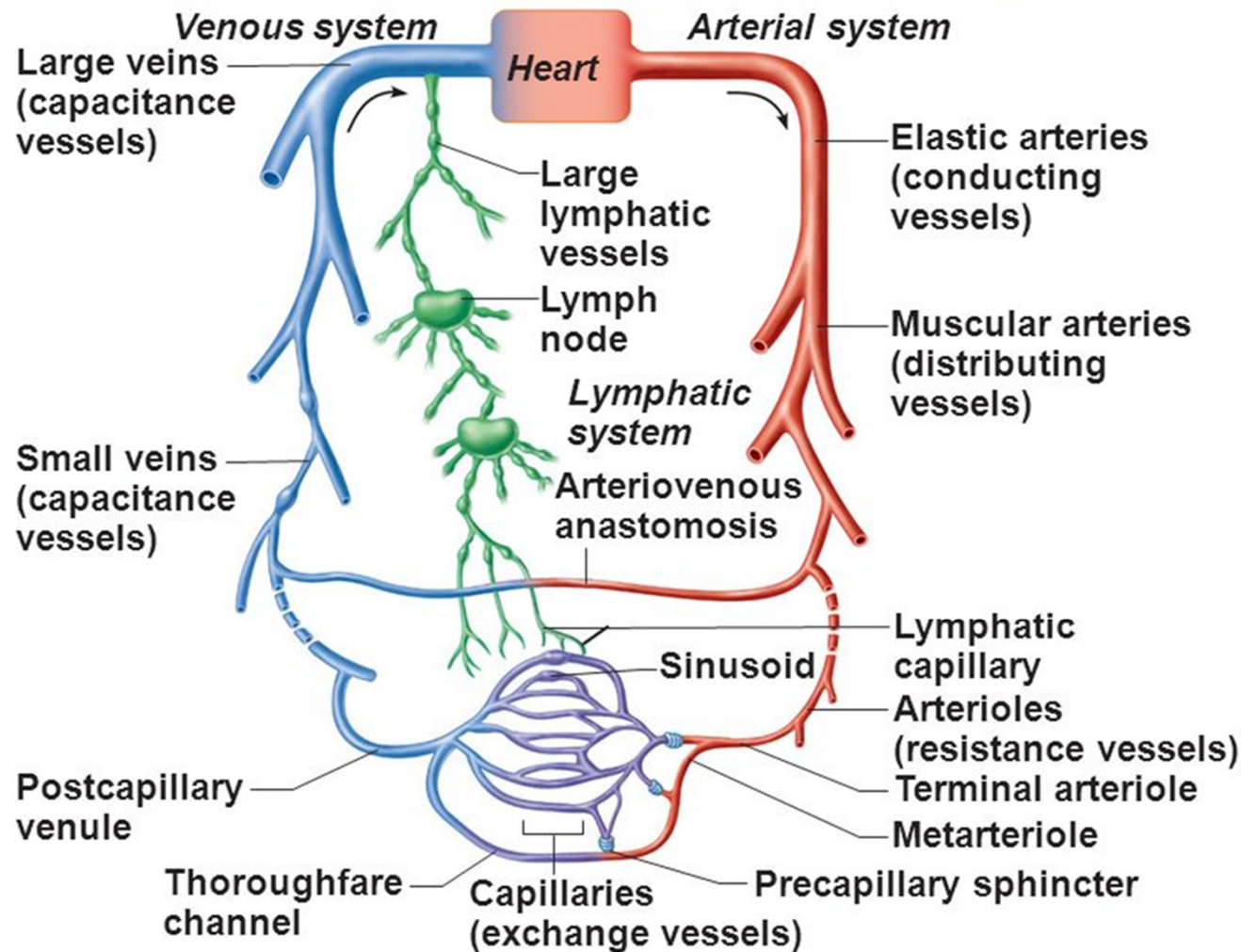


**Cannot Understand Edemas
Unless we Understand our
Circulatory System**

Three sets of vessels
comprise the
circulatory system:

- **Arteries-** Typically represented in **RED**
- **Veins-** Typically represented in **BLUE**
- **Lymphatics-** Typically Represented in **GREEN**

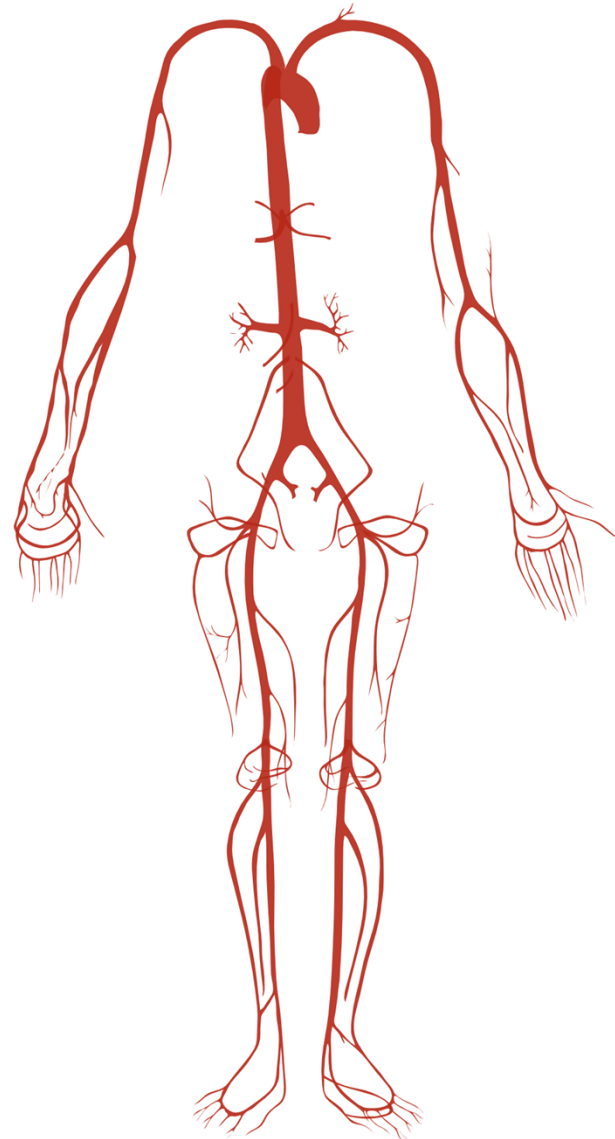
Blood Vessels: The Vascular System



Arterial System

Basic purpose: to carry blood from the heart to our organs and tissues

This blood carries fresh oxygen and nutrients to keep these tissues healthy

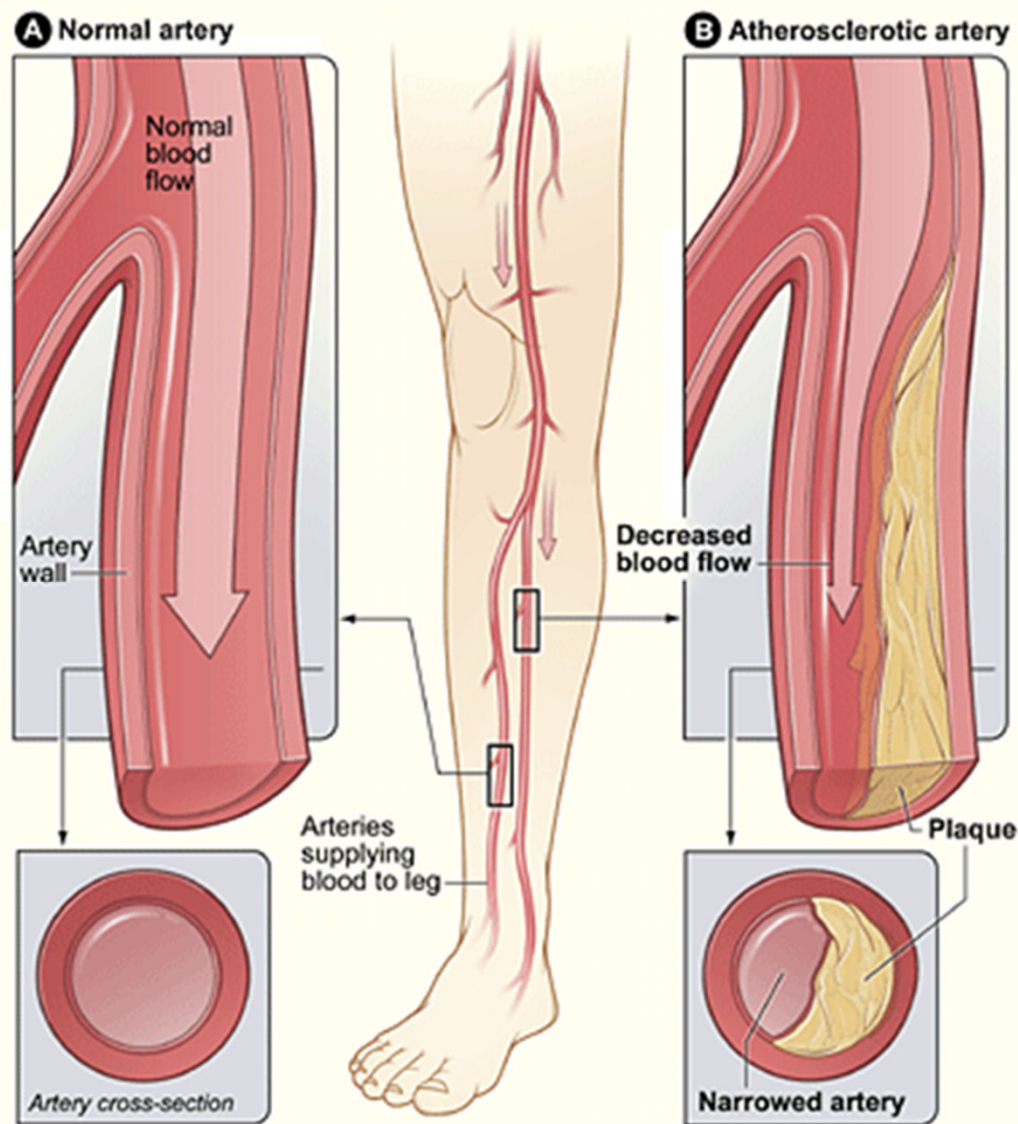


Peripheral Artery Disease (PAD)

The most common cause is the accumulation of plaque inside arteries resulting in decreased blood flow

Obstruction of blood supply will not only manifest in the legs but also in the heart and brain, increasing the chances of developing a heart attack or stroke

High cholesterol, hypertension, smoking are risk factors for atherosclerosis and peripheral arterial disease.





Peripheral Artery Disease (PAD)

What to look for:

- Leg pain
- Wounds-won't heal
- Cramps at night
- Numbness
- Weakness in legs
- Changes skin/nails
- Muscle atrophy
- Unusual color of skin
- Tissue death
- Cold feet
- Erectile Dysfunction



Peripheral Artery Disease (PAD)

Treatment:

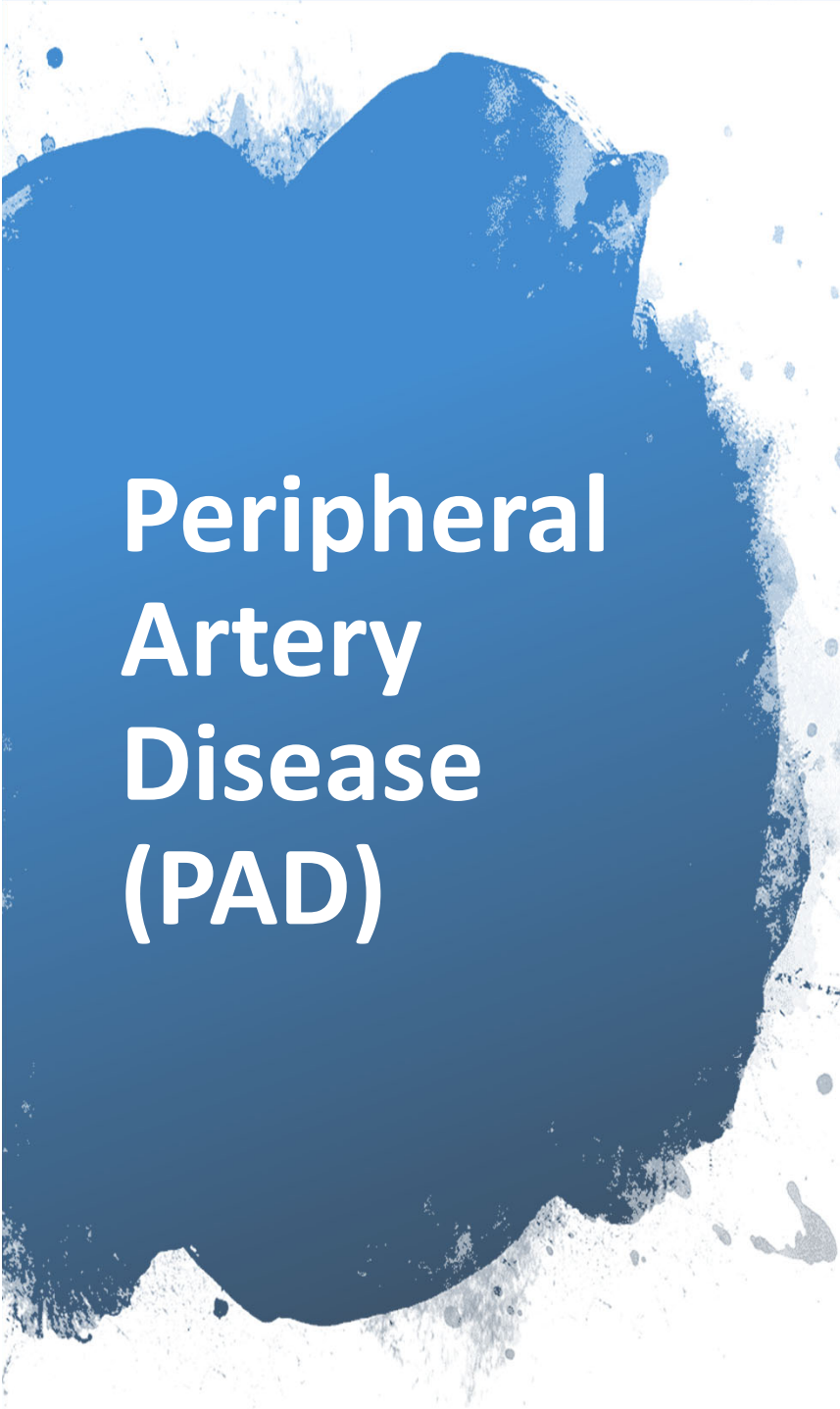
Complicating because advanced PAD can result in chronic edema.

Need to be in close communication with the physician and ensure your patient has the cognitive abilities to follow your directions correctly.

Treatment to treat the chronic edema is typically contraindicated with PAD including:

Elevation Compression
stockings

Medical Compression
Bandaging



Peripheral Artery Disease (PAD)

- Conservative Treatment Options:
 - Exercise- Muscle pumping is always a good option...muscle pump action encourages distal blood flow and encourages lymphatic pumping to decrease secondary edema.
 - Skin care is a must, hygiene, hydration, moisturizing, proper clothing/shoe wear...patient education!

Real Life Points to Ponder...

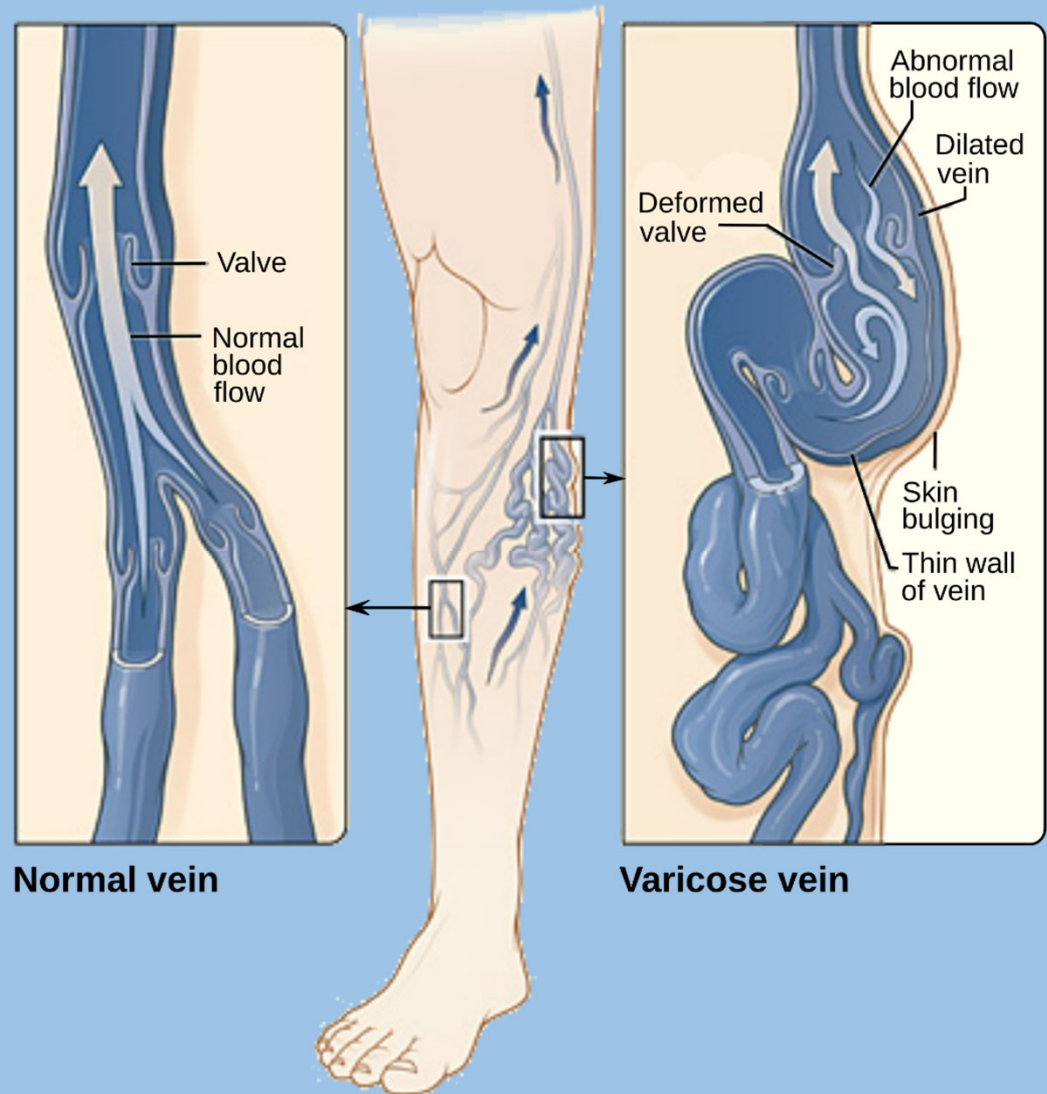


- If your patient has PAD, would you elevate the foot of the bed?
- So if your patient has PAD, would you apply compression on their legs?
- Great resource for compression needs:
<https://www.compressionguru.com/lymphedema>

Venous System

Basic Purpose: To transport blood to the heart after the cells in the body exchange their waste products for the blood's oxygen.

Veins return the blood to get re-oxygenated.



Peripheral Vascular Disease (PVD)



- Most commonly seen with edema:
 - Chronic Venous Insufficiency
 - Do you notice anything interesting in this photo?



Chronic Venous Insufficiency

Occurs when drainage from the veins is inadequate.

Inadequate venous drainage may occur as a result of obstructed blood flow between the limbs and the heart or because of reflux backward of blood into the veins caused by faulty valves.

Chronic Venous Insufficiency

- Pitting (?)
- Brawny-swollen and hard
- Hemosiderin staining-iron deposits
- Fibrosis of subcutaneous tissue
- Atrophic skin-wasting away





Chronic Venous Insufficiency

The most common cause of obstruction is a deep venous thrombosis (DVT); other causes are inherited abnormalities and compression of the vein, for example from a tumor.

One third of all patients with DVT will develop chronic venous insufficiency, usually within 5 years.

Reflux, or excess flow back into the veins, may occur when the valves in the vein fail, most commonly as a result of clot-related scarring or an inherited valve abnormality.

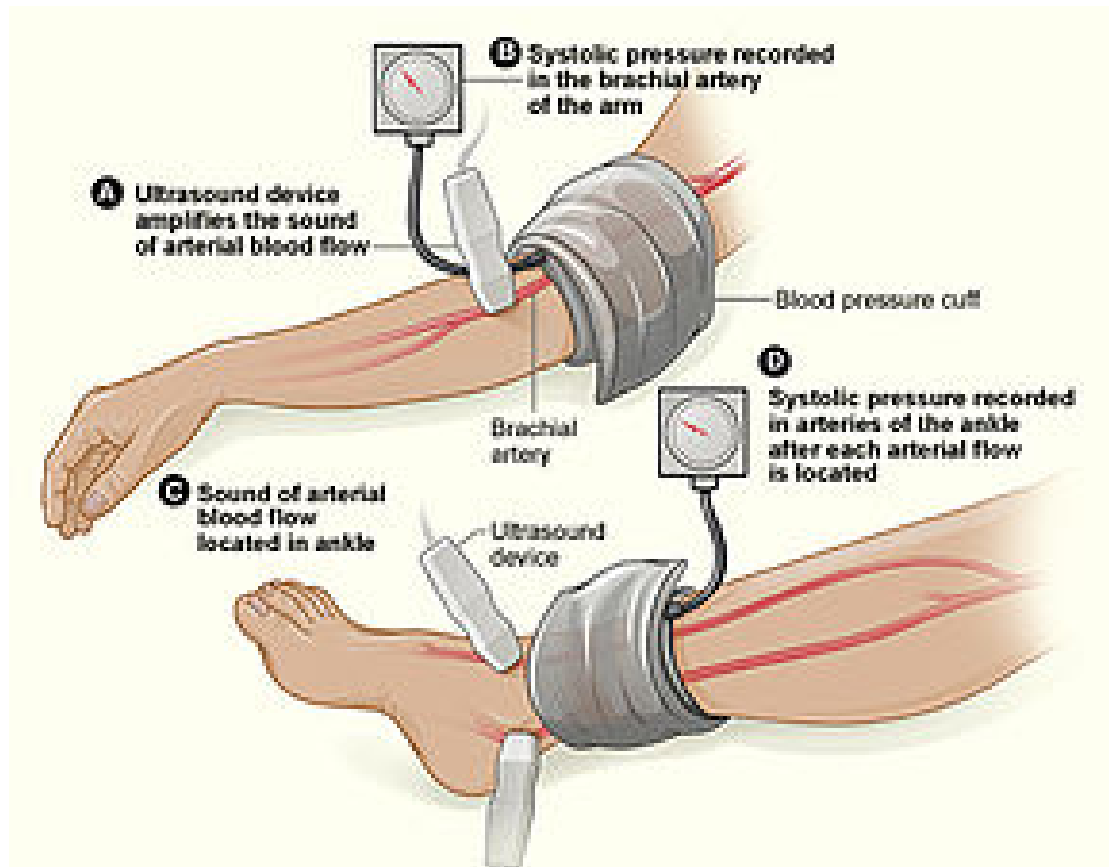


Deep Venous Thrombosis

- Potentially lethal disease (PE)
- Sudden onset
- Usually unilateral
- Painful
- Cyanosis
- Positive Homan's sign
- Venous Doppler
- Duplex ultrasound
- Know your facilities protocol!!!

Well's Criteria for DVT

- <https://www.mdcalc.com/wells-criteria-dvt>



Ankle Brachial Index (ABI)

The ankle-brachial pressure index (ABPI) or ankle-brachial index (ABI) is the ratio of the blood pressure at the ankle to the blood pressure in the upper arm (brachium). Compared to the arm, lower blood pressure in the leg suggests blocked arteries due to peripheral artery disease (PAD).



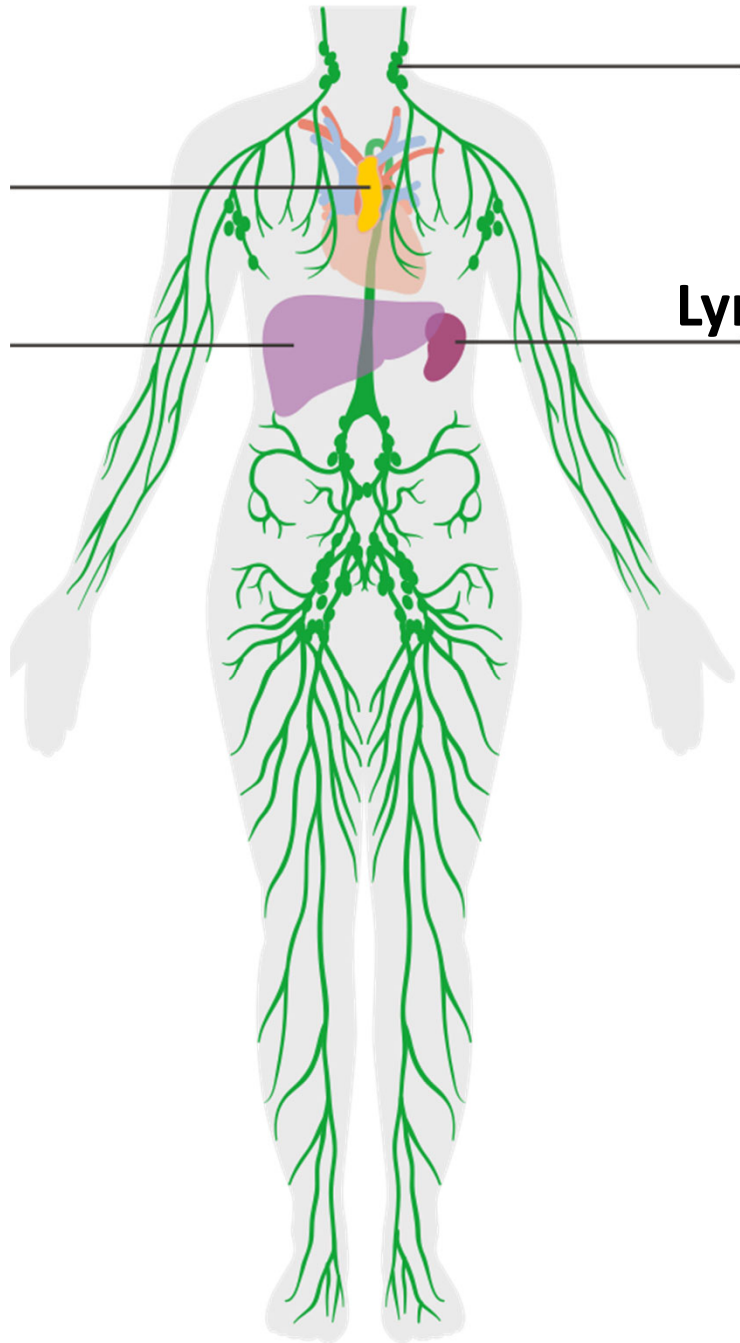
Treatment for PVD

- Some of the techniques (we will learn about later) for lymphedema treatment are appropriate.
- Key is compression that is well fitted and well tolerated.
- Patient must cognitively be able to safely follow home program.
- Manual Lymphatic Drainage (MLD)
- Skin Care
- Exercises
- Medical Compression Bandaging
- Compression garments

Real Life Points to Ponder...

-
- If your patient is post op total hip and complaining of calf pain...you should massage the calf firmly to increase their comfort?
 - If your patient has venous insufficiency it is a good idea to have them sit in an upright chair with legs dangling to the floor for several hours at a time?



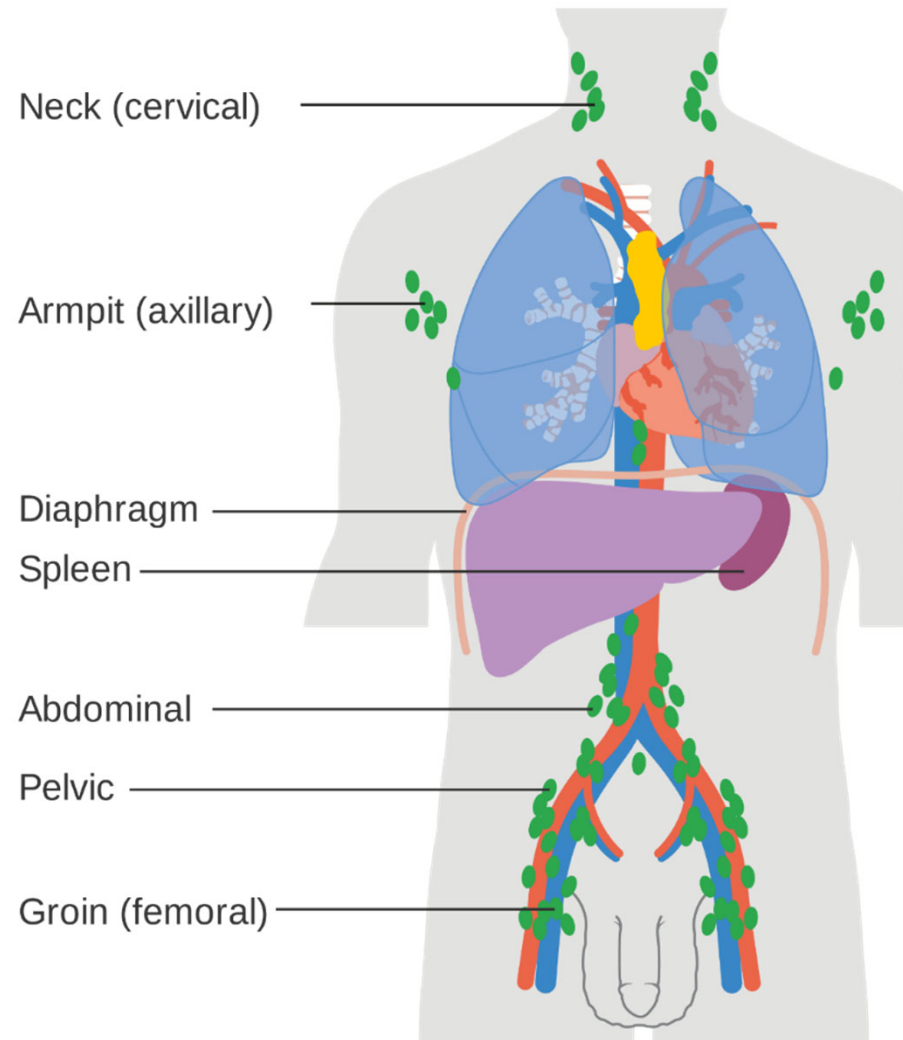


Lymphatic System

- Transports excess interstitial fluid out of the tissue and back to the bloodstream.
- Maintains blood volume homeostasis around body cells and assists movements of materials into and out of cells.
- Transports fat, proteins, and nutrients around the body.
- Provides immunological defenses against disease.

Components of the Lymphatic System

- Lymph vessels
- Lymph nodes
- Spleen
- Thymus gland
- Tonsils
- Peyer's patches
- Lymphocytes





What is Lymphedema?

- A chronic disorder in which fluids fail to circulate properly, creating swelling
- Lymphedema can occur anywhere in the body
- This lymphedema was the result of the removal of a fibromyxoid sarcoma from her upper thigh, MANY years later!





Primary Lymphedema

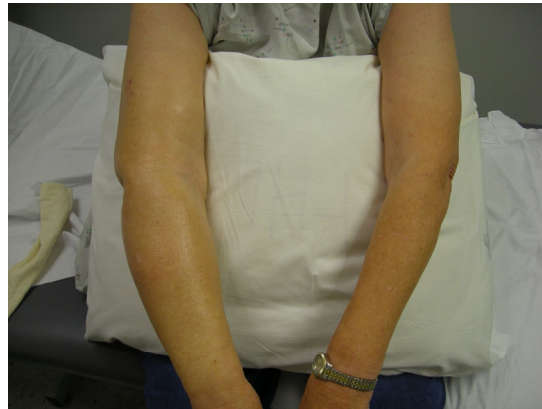
- Imperfect development of lymph vascular system: aplasia, hypoplasia, hyperplasia
- Abnormal at birth vs. possible degenerative process





Secondary Lymphedema

-
- Filariasis (#1 cause worldwide)
 - Surgery and/or radiation for cancer (#1 cause of UE lymphedema in the US)
 - Trauma
 - Infection
 - Cancer
 - Obesity
 - Chronic venous insufficiency
 - Self induced



Anatomical Locations

Causes for Unilateral Edema

Causes for Unilateral Edema^{2,3}

Acute unilateral LE edema < 72 hours

- DVT
- Cellulitis
- Musculoskeletal trauma
- Compartment syndrome
- Ruptured Baker's Cyst

Chronic unilateral LE Edema > 72 hours

- Venous Insufficiency (CVI)
- Post-thrombotic syndrome
- Primary or secondary lymphedema
- May-Thurner Syndrome (iliac vein compression syndrome)
- Complex Regional Pain Syndrome (CRPS)
- Congenital venous malformations
- Pelvic tumor or lymphoma

Causes for Bilateral LE Edema^{2,3}

Acute bilateral LE edema

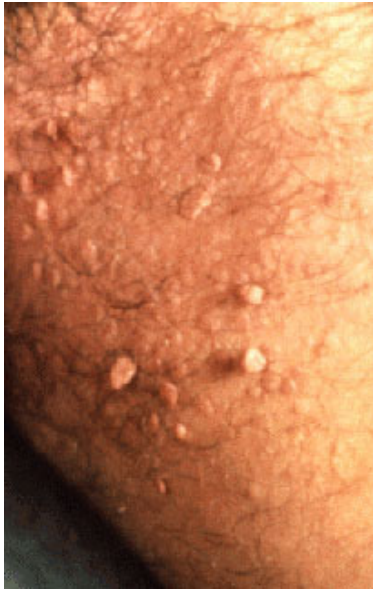
< 72 hours

- Acute worsening of systemic cause (cardiac, renal, or liver disease)

Chronic bilateral LE Edema

> 72 hours

- Venous Insufficiency (CVI)
- Primary or secondary lymphedema
- Pelvic tumor or lymphoma
- Malnutrition/malabsorption
- Pulmonary Hypertension
- Dependent edema
- Heart failure
- Renal disease
- Liver disease
- Lipedema
- Pregnancy
- Medications
- Obesity



Symptoms of Lymphedema

- Obvious swelling in any part of the body
- Pain or numbness, heaviness
- Skin color/texture changes (hyperkeratosis, papilloma)



Symptoms

Starts distally

- (+) Stemmer's sign (squaring of toes)
- "buffalo hump" edema on dorsum of foot
- Loss of ankle contour
- Cellulitis is common





Symptoms

- Decrease in strength
- Loss of mobility
- Hardening of the skin
- Skin ulcerations
- Onset may be slow/progressive
- Pitting edema in early stages

CONTRAINDICATIONS FOR LYMPHEDEMA TREATMENT



- Edema with unknown etiology
- Cellulitis, active infection or skin fungal infections
- Unstable CHF
- Cardiac complication or uncontrolled hypertension
- Pregnancy
- Severe renal problems
- Deep vein thrombosis
- Severe pulmonary issues



Outpatient Therapy May Include

- Manual Lymphatic Drainage (MLD)
- Skin care, patient education, family training
- Medical compression bandaging
- Exercise and home programs
- Compression- over the counter vs. custom garments
- Kinesiology taping
- Flexitouch® Medical Compression Pump

Manual Therapy



In the oncology population, manual therapy is beneficial for:



Breast Surgery / Lumpectomy / Mastectomy



All Reconstructive Surgeries



The Joint/Muscle side effects from Tamoxifen and Aromatase Inhibitors



Chemotherapy Toxicity (fatigue, neuropathy, deconditioning)



Radiation Therapy



Lymphedema Risk Reduction and Lymphedema Management

Manual Therapy

- Pain, stiffness, < fxn, cording, scar tissue & fibrosis, restricted ROM
- AWS: may be attributed to lymph venous injury during axillary lymph node dissection due to either tissue retraction and/or patient positioning.
- Another theory is that because of the interruption in axillary flow, lymphatic vessels are dilating and scalloping to the skin.

Cording



Risk of Developing Lymphedema

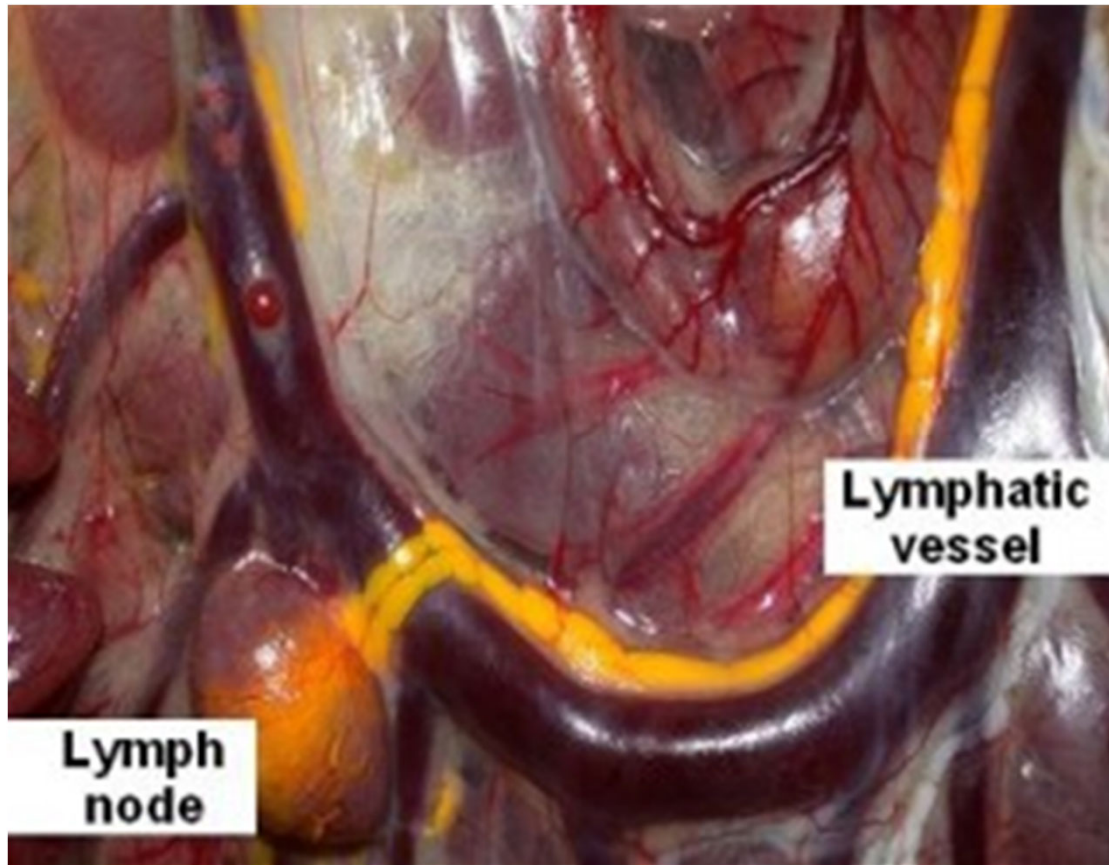
Number of lymph nodes removed correlates with the risk of developing lymphedema. Risk is approximately ½ with SLNB.

SLNB=8%

SLNB + radiation=17%

ALND=15%

ALND + radiation=30%

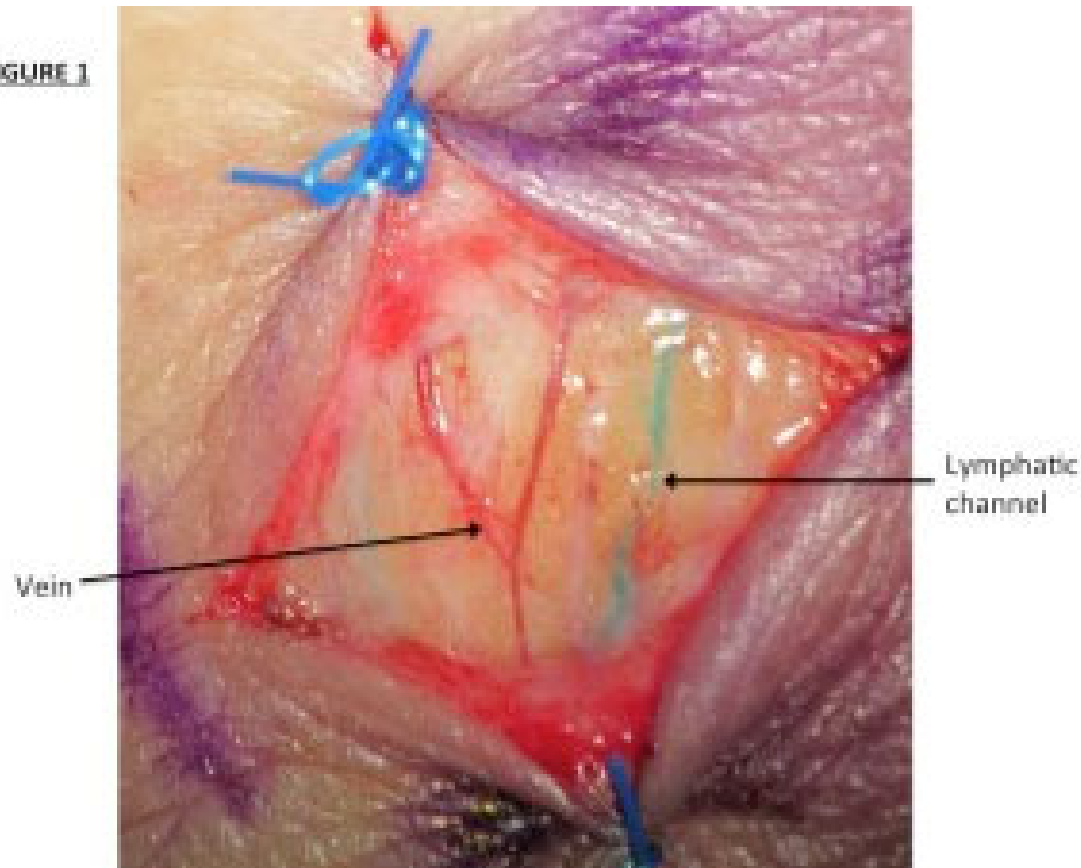


Working lymph nodes from another part of the body are transferred to the damaged site, where the existing blood vessels that supply the nodes are then connected.

Vascularized Lymph Node Transfer



FIGURE 1



Lymphaticovenular Bypass

Involves shunting, or moving, fluid from several dilated lymphatics in the affected limb to adjacent venules (tiny veins) to reduce pressure.



All surgical procedures are invasive, costly, involve significant risks, and the long-term results are not yet known.

Conservative management of lymphedema with complete decongestive therapy is noninvasive, with minimal to no side effects for patients, shows excellent long-term results, and should always be the treatment of choice.

CDT is considered the gold standard treatment for lymphedema and with properly applied treatment techniques and patient compliance is able to successfully manage lymphedema in the majority of patients

Actress
Kathy
Bates:

- “Because ‘you’re’ successful, ‘we’re’ surviving, and now we need your help, to educate not just each other but all cancer surgeons...to help build a robust bridge from the trauma of surgery to quality of life after cancer.”

Breast Surgeons Share Strategies to Prevent Lymphedema

www.clinicaloncology.com
January 20,
2020

- Proactively, Axillary Reverse Mapping (ARM), can help surgeons identify lymphatics and lymph nodes in the axilla that drain the upper extremity and reduce lymphedema risk...adding only a few minutes to operating room time, requiring no special equipment.

Breast Surgeons Share Strategies to Prevent Lymphedema

- Performed by injecting an isotope into the breast to identify the sentinel node, and a blue dye into the arm to identify the arm nodes. Aides in preservation of lymphatics.
- For patient whose arm nodes cannot be preserved due to the extent of their disease and possible malignancy, Dr. Feldman recommends immediate lymphovenous bypass at the time of ALND
- Started from Italy with the LYMPHA approach-Lymphatic Microsurgical Preventative Healing Approach

Axillary Reverse Mapping (ARM)

During the time of your lymph node surgery, whether it is the sentinel node surgery or axillary dissection surgery, a blue dye is injected in the upper arm.



This blue dye helps identify the lymphatic channels and lymph nodes that drain the arm, and the surgeon then tries to avoid disrupting these channels.



This technique has been adopted by many breast surgeons with excellent results. Traditionally, the rates of arm swelling after sentinel node biopsy range from 3-8%¹ and from 13-40%² after axillary dissection surgery. The studies that looked at ARM show a lymphedema rate that is lower, around 1-3% for the sentinel node surgery and 4-9%³ for the axillary dissection surgery.

Sometimes, it is not always possible to do ARM, and the surgeon needs to inject the blue dye in the breast to help identify the correct lymph nodes. This may be the case if you have had previous chemotherapy in the breast, or if the lymph nodes are not accurately found with other methods.

Additionally, it is possible that the blue lymph nodes and the channels that are identified to drain the arm need to be removed to treat your cancer safely. If this is the case, you may be placed in a special group to watch your arm swelling closely, or even have the option of having these channels reconnected. This is usually done by surgeons well experienced in lymphatic surgery, and may include plastic surgeons also.

Herantis' Lymfactin[®] is the world's first and only clinical stage gene therapy that repairs damages of the lymphatic system. It expresses the human growth factor VEGF-C, which is natural and specific for the development of lymphatic vessels.

Based on preclinical studies, Lymfactin[®] triggers the growth of new functional lymphatic vasculature in the damaged area and thus repairs the underlying cause of secondary lymphedema. Lymfactin[®], patented by Herantis, is based on the internationally renowned scientific research of academy professor **Kari Alitalo** and his research group, a national centre of excellence at the University of Helsinki.

“Lymph Vessel on a Chip Reveal Possible New Drug Target for Lymphedema”



Science Magazine-Eva Frederick,
December 13, 2019



Built a model of a lymphatic system
on a chip, suspending human lymph
vessel cells in a collagen in a small
polymer box.



Integrin alpha-5-when activated
signaled cellular junctions to tighten
and prevent the flow of lymph fluid.



When a compound was
administered to inactive integrin
alpha-5, the vessels allowed
drainage.

LymphaTouch-

<https://www.lymphatouch.com/>

Generates negative pressure in the tissues while simultaneously opening the lymphatic capillaries.





**When is the Patient
Ready for Therapy**

When the cause
is known

When infection
is cleared

When cancer is
in remission

When physician
determines
medical stability



Why Treat These Patients

- Untreated Lymphedema can lead to:
 - Increased swelling
 - Reduced range of motion
 - Cellulitis
 - Permanent disfigurement
 - Pain and numbness
 - Decrease in strength/mobility/falls
 - Hardening of the skin
 - Repeat offenders for other issues...falls!



Why Treat These Patients

- Increased risk of infection
- Skin ulcerations
- Psycho-social issues
- Decreased independence with daily activities resulting in increased caregiver need
- Tissue necrosis, gangrene, amputation



In Summary

- Early identification of the signs and symptoms of lymphedema should be essential to the management of all patients.
- When treated in the earliest stages, complications of lymphedema are greatly minimized with quality of life maximized.

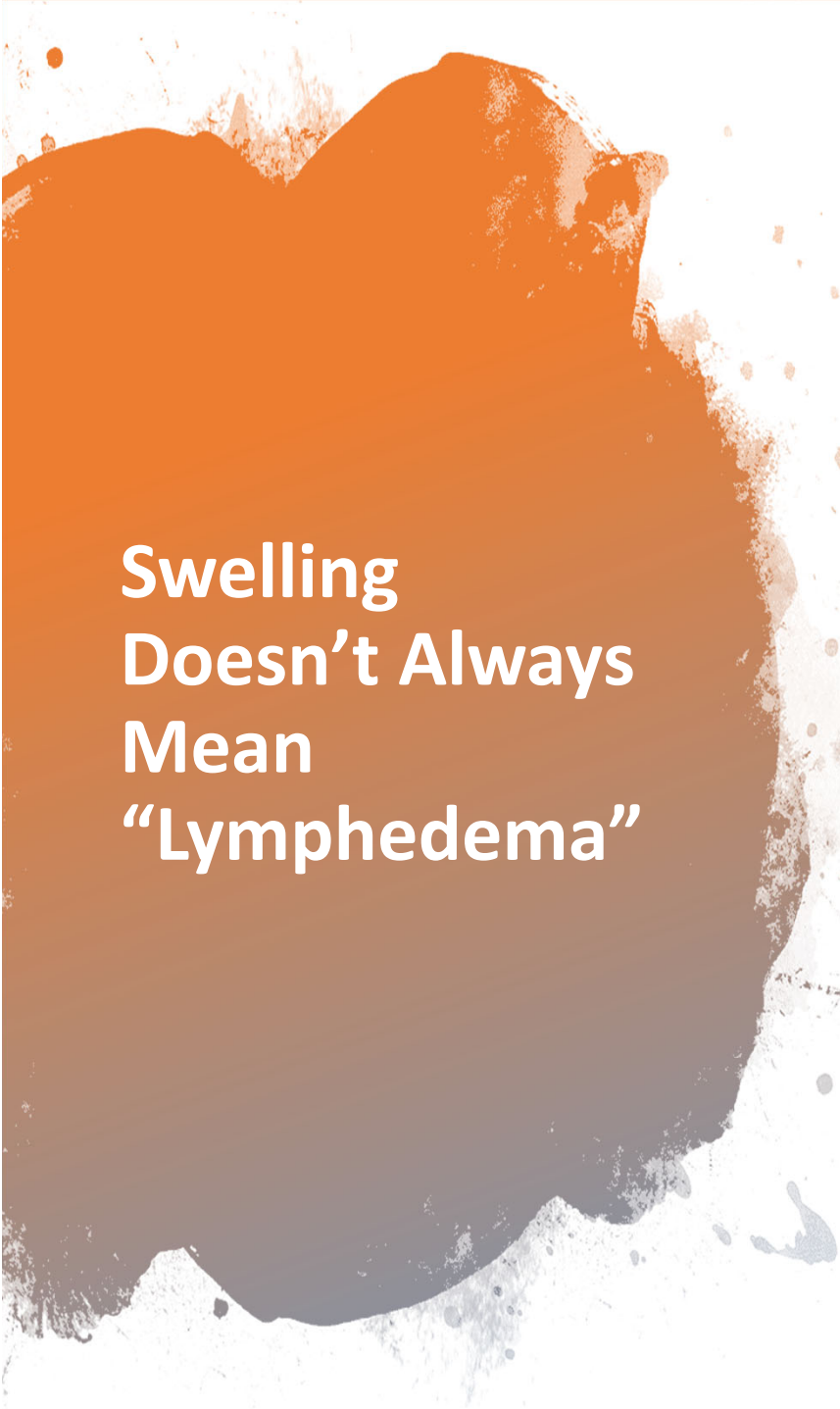
Two Key Points To Remember

- Ted's in the Bed



- Treat then Fit



A large, textured orange watercolor splash graphic on the left side of the slide, with various shades of orange and brown, and some darker, almost black, areas at the bottom.

**Swelling
Doesn't Always
Mean
“Lymphedema”**

Differential Diagnosis:

- Lipedema
- Chronic Venous Insufficiency (CVI)
- Acute Deep Venous Thrombosis (DVT)
- Congestive Heart Failure (cardiac edema)
- Malignancy
- Chronic Regional Pain Syndrome
CRPS (RSD)

Acute Edemas

(short duration, rapidly progressive, and in need of urgent care)

- Inflammation- swelling, redness, heat, and pain produced in an area of the body as a reaction to injury or infection





Acute Edemas

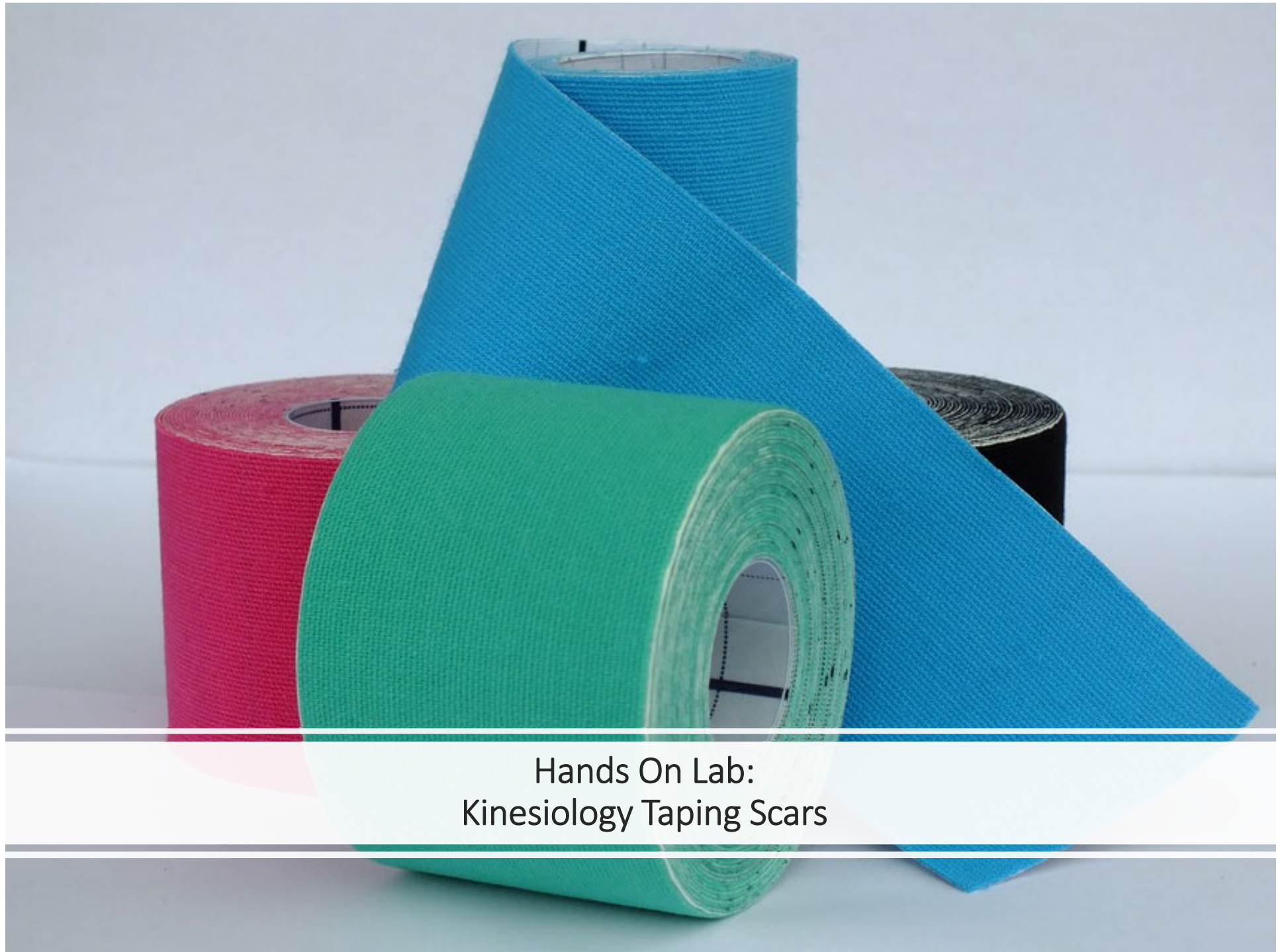
(short duration, rapidly progressive, and in need of urgent care)

- Infection- invasion and multiplication of microorganisms in body tissues, especially that causing local cellular injury



- Post Surgical/Orthopedic Edema: *(short duration, can be progressive, and in need of care)*

Sub Acute



Hands On Lab:
Kinesiology Taping Scars

**What This
Course IS
NOT**

*This IS NOT a
certification course in
Kinesiology taping.*

*This course DOES NOT
train you to treat as a
Certified Kinesiology
Taping Practitioner*

Kinesiology Tape

Kinesiology tape created by Dr. Kenzo Kase in the 70's

Became popular in the 2008 Olympics

Now various names/brands: Kinsiotex tape, KT Tape, Rock Tape, Spider Tech

Kinesiology Tape vs. Athletic Tape

- Athletic/McConnell Taping

- Stabilization
- Restrictive/supportive
- Restricts fluid exchange
- Not waterproof
- Worn a few hours

- Kinesiology Taping

- Stabilization
- Allows mobility
- Increased circulation
- Waterproof
- Can be worn several days





Relevance to Healthcare Professionals

Kinesiology tape can be used in many settings including: pediatrics/ortho/ neuro/ trauma/edema patients, in addition to your oncology patients.

Kinesiology tape provides you with one more modality to pull out of your therapy toolbox.

Athletes



Horses and Their Jockeys



Young Athletes





During Maternity



Postpartum Breast Engorgement

- Engorgement is defined as congestion and/or distention of the breast with fluid
- 2/3rds of postpartum mothers will experience at least moderate symptoms of engorgement when milk comes at 3-5 days.



Postpartum Breast Engorgement

- Hypothesizing that lymphedema could be part of the distention in the breast that causes engorgement.
- Conclusion: possible option to decrease firmness and increase comfort, may improve breast feeding efficiency.



Basic Principles/Functions

- Skin
- Muscular
- Lymphatic
- Joint

Four Major Physiological Effects



1. Analgesic System

Function: relieves pain or abnormal feeling on the skin & muscles

2. Muscle Function:

supports the Muscle in Movement
(Expanding Effects)

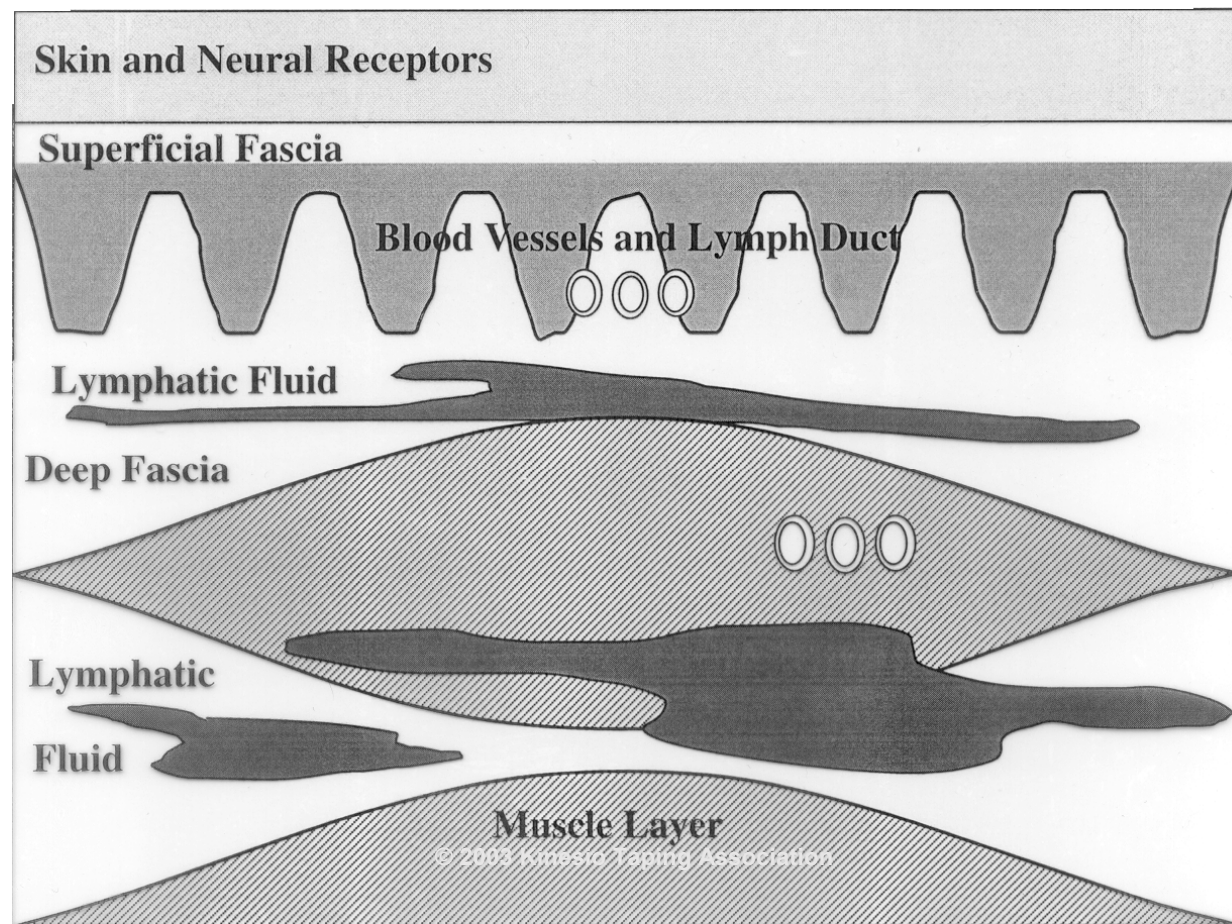
3. Lymphatic Function:

removes congestion of lymphatic fluid or hemorrhages under the skin

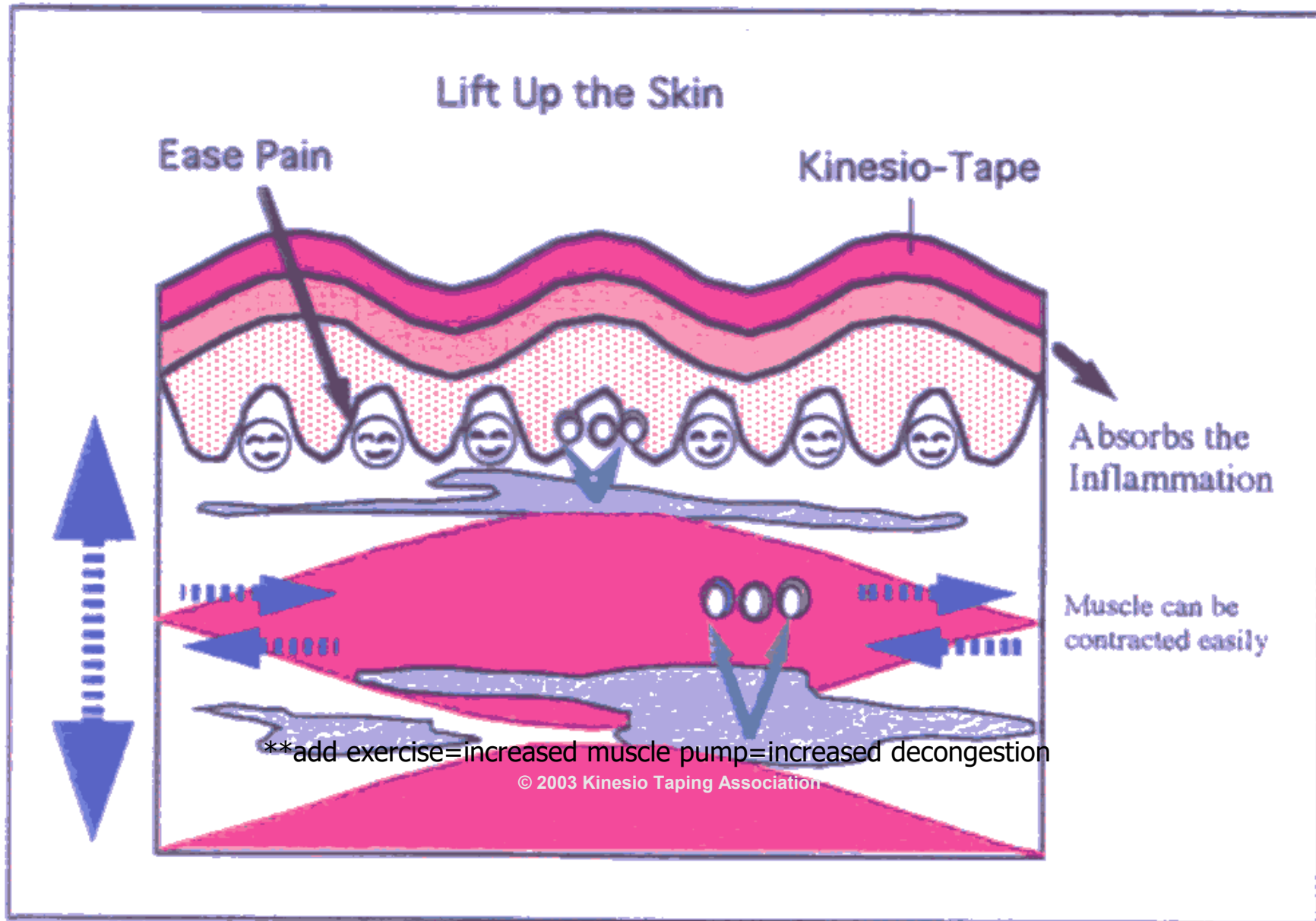
4. Joint Function:

corrects misalignment of the joint

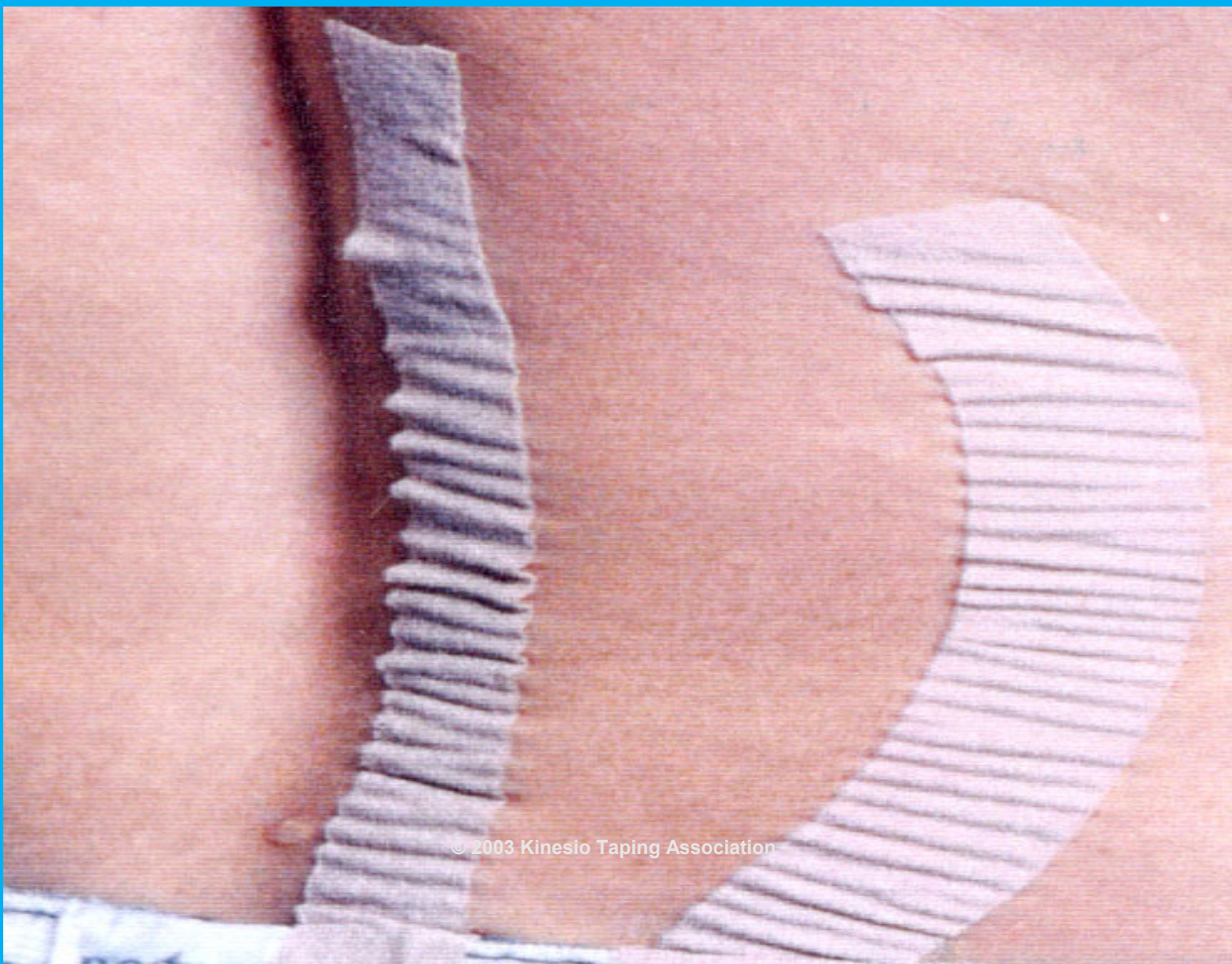
Space for Flow of Lymphatic Fluid



After Taping Application



Convolutions- Sacrospinalis



Lymphatic Function

Improves blood and
lymphatic
circulation

Opens lymphatic
drainage directly
under skin

Reduces excess
heat and chemical
substances in tissue

Reduces
inflammation

Reduces abnormal
feeling and pain in
skin and muscle

Effects on Lymphatic Drainage

Lifts the skin, causing convolutions which provide space and decrease pressure which allow filaments attached to skin to open allowing for lymph to fill in lymphatic capillaries

Creates areas of decreased pressure, which allows areas of higher pressure to migrate to areas of lower pressure

Decreases pain as a result of decreased stimuli on pressure receptors and gate control theory

Case Example-Lymphedema



Lymphatic Function

After 12 hours of the application



Case Examples-Softball Injury



Softball Injury Progression Over 4 treatments



Qualities



Elasticity of up to 130-140% of resting length



100% Acrylic heat sensitive adhesive



Stretches along longitudinal axis only



Thickness and weight approx. same as skin, therefore skin does not perceive tape

Qualities



No medicinal properties in tape,
and NO LATEX



Able to be worn for several days,
able to shower with tape applied



Tape is applied to paper backing
with a 10% stretch



Colors- blue/cool pink/warm

Application

Joint is moved through a full range of motion prior to completing tape application

I, X, Y, Fan, & Web cut-strips are used, with the “Y” & “I” cut being the most common

1”, 1.5”, 2”, & 3” tape are available, with 2” being the most commonly used

Application

Tape is applied to stretched tissue, minimal stretch is added to the tape (*I to O, laying the tape down with approx. 15%-25% stretch, O to I, basically with 25-50% stretch*).

Tape is slightly stretched if applied to non-stretched skin.

Tape is applied with elastic stretch taken out only when used as a corrective technique (NO stretch on ends).

Application



Skin should be free of oils and dry, spray adherent can be used/skin prep



After application, lightly rub the tape to activate the heat sensitive adhesive



Tape application in moist areas, may want to use water resistant tape (feet/hands)



Tape both the pain, and cause of the pain



Rounding edges decreased “catch” on clothing etc.

Limitations



Body hair may need to be clipped or shaved



Apply approx. 30 minutes before activity



Application during activity, may require the use of a tape adherent



Patient understanding & willingness to wear tape for multiple days, or in public

Initial Difficulties in Application



Training for use of athletic tapes teach the need to “pull tape” for support



Need to treat both the pain and the cause of pain, providing for correction of symptoms



Proper muscle evaluation critical in obtaining positive results, also knowledge of the Lymphatic system helpful



Unlearning what “tape” can be used for

General Benefits

More economical

Easy to apply-quick

Less types of tape

Therapy continues after leaving the clinic

Visual reminder to the patients for HEPs

Applied for a longer period of time
(application generally lasts 3-4 days)



Scar Management

- Apply in a manner to create a friction with movement to breakdown scar tissue







Demo- Preparation for Application



AT&T LTE 6:54 AM 73%

< Best to sit this one out 😊 #mondayfun...



McKenzie Institute Australia

Best to sit this one out 😊

#mondayfunnies #ebp #mdt

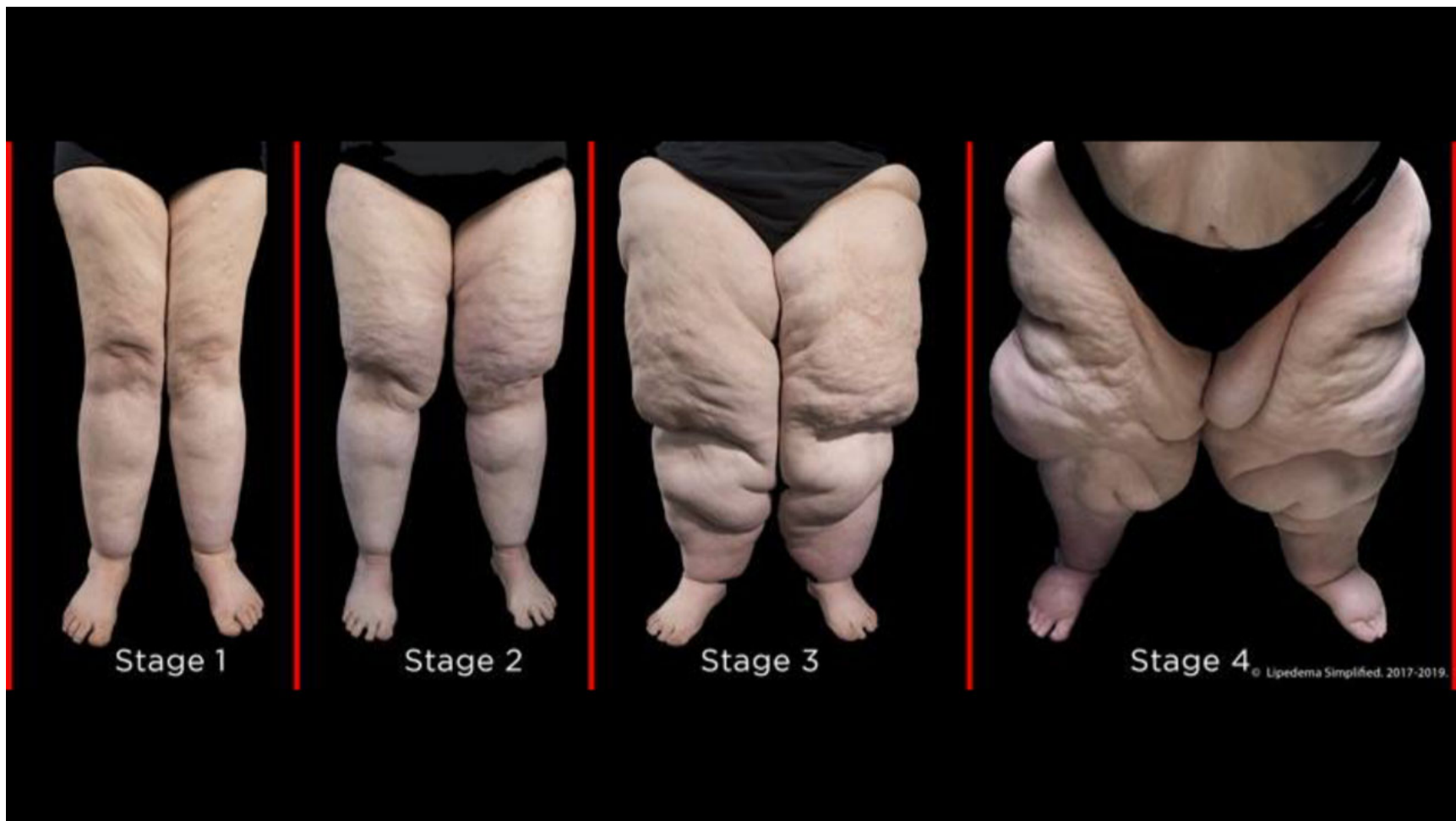
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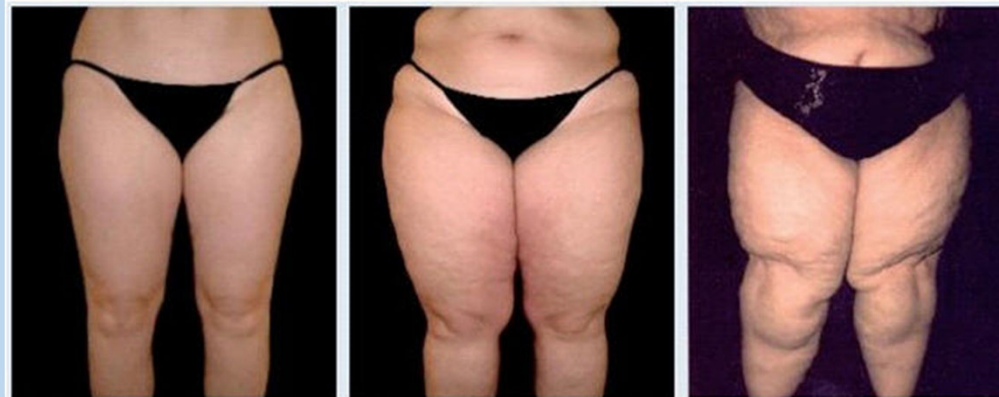


Lipedema

- Mainly in women
- Bilateral, symmetrical swelling from iliac crest to ankles
- Dorsum of feet never involved
- Stemmer's sign negative
- Little or no pitting (soft tissue texture)
- No cellulitis
- Painful to palpation, bruise easily

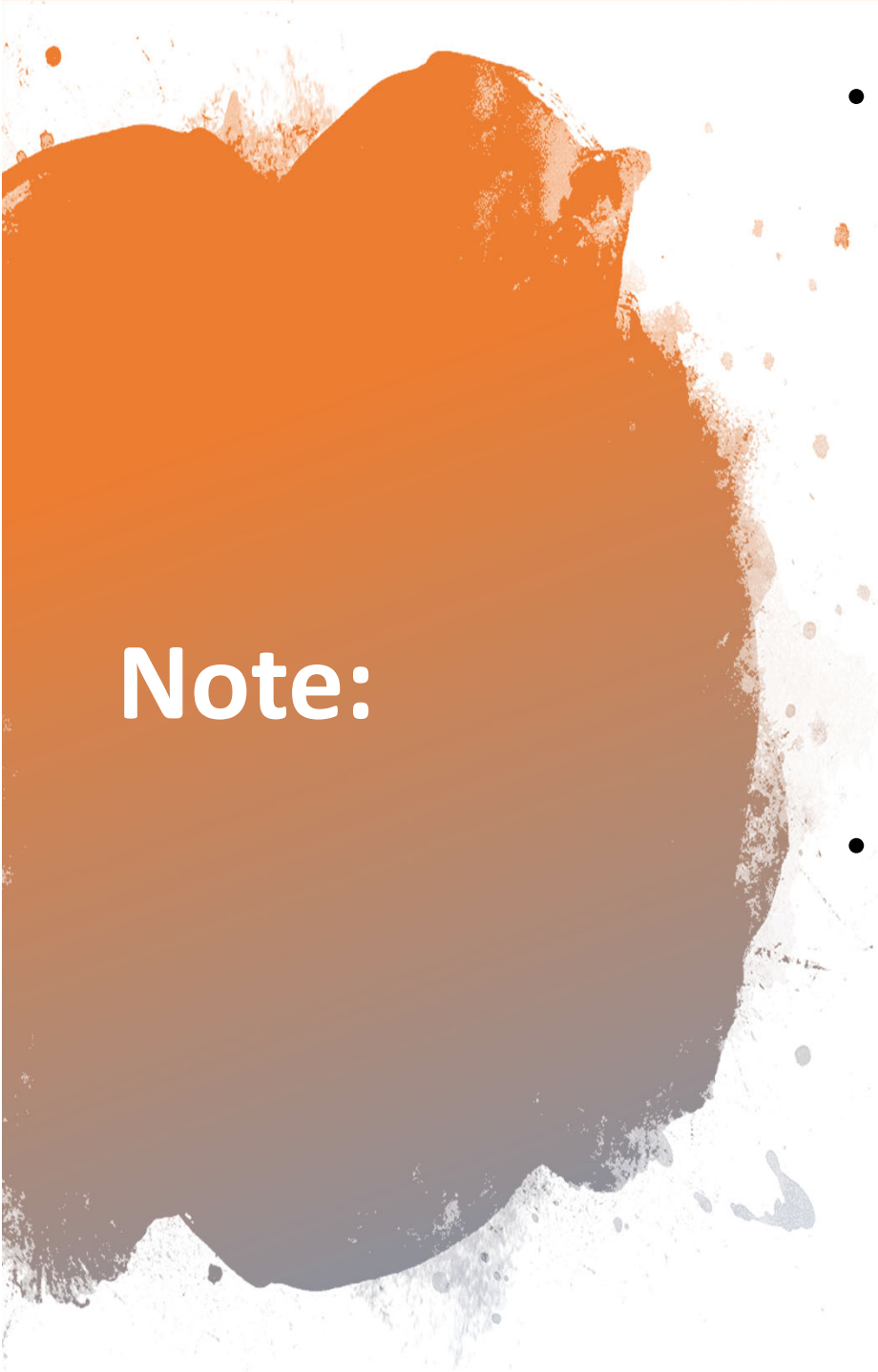


Lipedema



Course
Objective 2: Ten
outcome
measures to
confidently
assess oncology
patients and
immediately
begin using in
your daily
practice

- For each of the co-morbidities discussed below, information is provided in your supplemental materials on the blog that support each condition.
- Outcome measures are provided for all, respect copyright.
- Handouts
- Evaluation forms
- Daily treatment records/notes



Note:

- Blood counts
 - May limit exercise and activity
 - Know if their doctor has specific protocols
 - Hospital specific protocols
 - Many published articles, ensure the rigor of the article and source
- Great resource for lab values with respect to rehab considerations:
 - <https://ptreviewer.com/lab-values-3/>

Cancer PRE-Hab:

Course Objective 4: Best practice of rehabilitation in conjunction with the American Cancer Society and the American Society of Clinical Oncology's cancer survivorship recommendations and guidelines

- Physical and psychological assessments PRIOR to the onset of acute cancer treatment
- Identifies
 - Baseline level of function-enables therapist to repeat and identify change.
 - Pre-Existing functional impairments
- Provides targeted interventions to improve functional status prior to cancer treatment



Cancer and Pain

How can we address anticipated pain?

- Brief Pain Inventory- provides baseline data
- Standard assessments- visual analog, etc.
- Exercise, stretching (particularly if head and neck ca)
- Education on expectations, home set-up, ADL retraining/AE
- Postural education (particularly with lung ca)
- Caregiver education

Post medical treatment: familiar territory

NOTE: Any pain that does not decrease within 2 therapy sessions should be reported to the MD.



Cancer and Pain

- Alternative Approaches to Pain Management
 - Relaxation
 - Distraction
 - Visualization
 - Meditation
 - Therapeutic massage
 - Biofeedback
 - Hypnosis
 - Exercise*

Exercise Prescription Course Objective 3:

Therapeutic exercise
and activity
prescription for
cancer rehab and
lymphedema
prevention



<https://ifpa-fitness.com/product/exercise-prescription-for-cancer/>

Program Design



Program Design-Aerobic Exercise/Strength-Resistance Training/Flexibility/Frequency, Intensity, Time, Type



Muscle/Group – Exercise: Low Conditioning – High Conditioning



Effects of Exercise on the Immune System



Exercise Testing



Contraindications to Exercise for Patients with Cancer



<https://www.cancerwa.asn.au/resources/2017-04-04-Exercise-Medicine-Newton.pdf>



<https://www.cancer.org/treatment/survivors/hip-during-and-after-treatment/staying-active/physical-activity-and-the-cancer-patient.html>

Cancer and Fatigue

- How can we address anticipated fatigue?
 - Brief Fatigue Inventory-provides baseline data
 - Others: FACT-F, EORTC Fatigue Subscale, Piper Fatigue
 - Exercise-increase pre treatment activity tolerance
 - Pacing/Energy Conservation/Work Simplification
 - Home modifications/adaptive equipment/DME
 - Coping mechanisms, sleep education
 - Patient/Caregiver education on expectations
 - See NCCN Guideline in Supplemental Materials

Distress/Depression/Anxiety



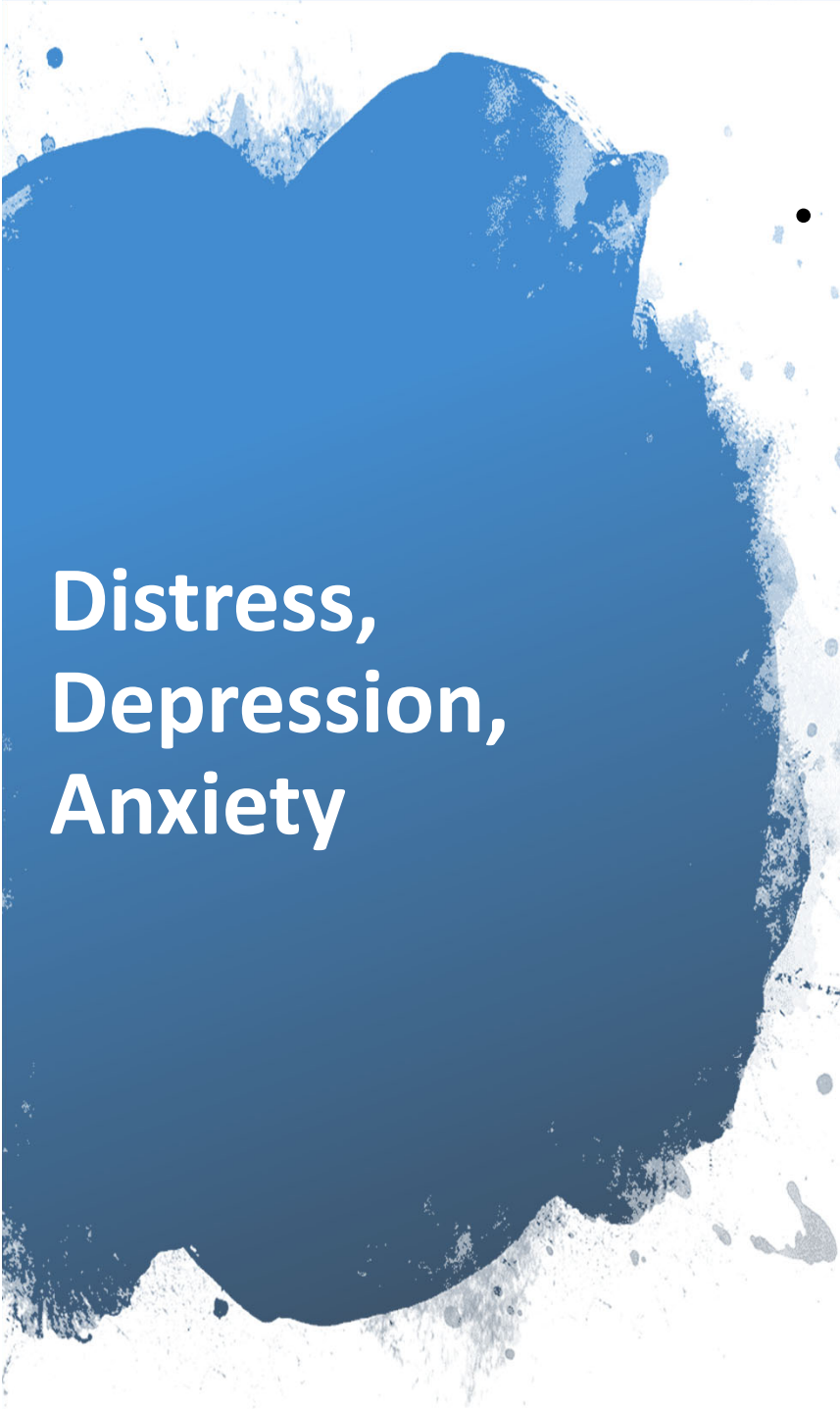
- Depression Short Form 6a
- Level II Anxiety Adult
- Quality of Life Questionnaire

Excellent downloadable
booklet for coping with
cancer:

[https://www.cancer.gov/
publications/patient-
education/advanced-
cancer](https://www.cancer.gov/publications/patient-education/advanced-cancer)

Contents

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Distress, Depression, Anxiety

- Treatment very individualized
 - Connect with social supports/support groups (online too)
 - Promote physical activity
 - Educate...its okay to be sad, stressed, anxious!
 - Deep breathing, relaxation
 - Animal assisted therapy—my opinion!
 - Coping and relaxation techniques
 - Leisure programs
 - Cognitive strategies
 - Activity and work adaptation
 - Assistive technology to optimize performance in activities of daily living

Bone Musculoskeletal Impairments



Disabilities of the Arm Shoulder and Hand (DASH)



Lots of assessments---familiar territory



Up to 80% of survivors' experience bone loss (Runowicz, et al., 2016).



Bone loss risk factors are increased when combined with other known risk factors including advanced age, prior fracture history, and family history of fractures.



Lifestyle related risk factors exacerbating chemo therapy-induced bone loss include smoking, excess alcohol, sedentary lifestyle, low calcium, and vitamin D deficiency (Runowicz et al., 2016).



Bone/Musculoskeletal Impairments

- Exercise/activity-weight bearing
- Brisk walking
- Climbing stairs
- Dancing
- Hiking
- Jogging
- Jumping rope
- Step aerobics
- Tennis or other racquet sports
- Yard work, like pushing a lawnmower or heavy gardening

Bone Musculoskeletal Impairments

Nutrition Consult
Education:

Risk factors and
a healthy lifestyle
Physical activities
Harms of tobacco

use and excessive
alcohol intake.



Sexual Health Impairments

- Sexually related side effects from cancer treatments include:
 - Sexual desire disorder/decreased libido (23%-64% of survivors)
 - Arousal or lubrication concerns (20%-48% of survivors)
 - Orgasmic concerns (16%-36% of survivors)
 - Dyspareunia (difficult or painful intercourse)(35%- 38% of survivors)
 - Sexual health concerns can decrease quality of life for the survivors and their respective partners resulting in a decreased quality of life for both (Runowicz et al., 2016).
- Sexual Health Needs Assessment Questionnaire

Sexual Health Impairments



Validation of survivors' sexuality by acknowledging and affirming the importance, relevance or priority that they may attach to intimacy and sexual expression



Listening to survivors' sexual concerns, if they wish to discuss them, by providing sensitive permission-giving strategies



Providing information on, or referring clients to, appropriate agencies



Advocating for better sexual health services if necessary (for example, when existing psychosexual health services are inaccessible)



Sexuality, Intimacy and Cancer

A guide for people with cancer
and their partners

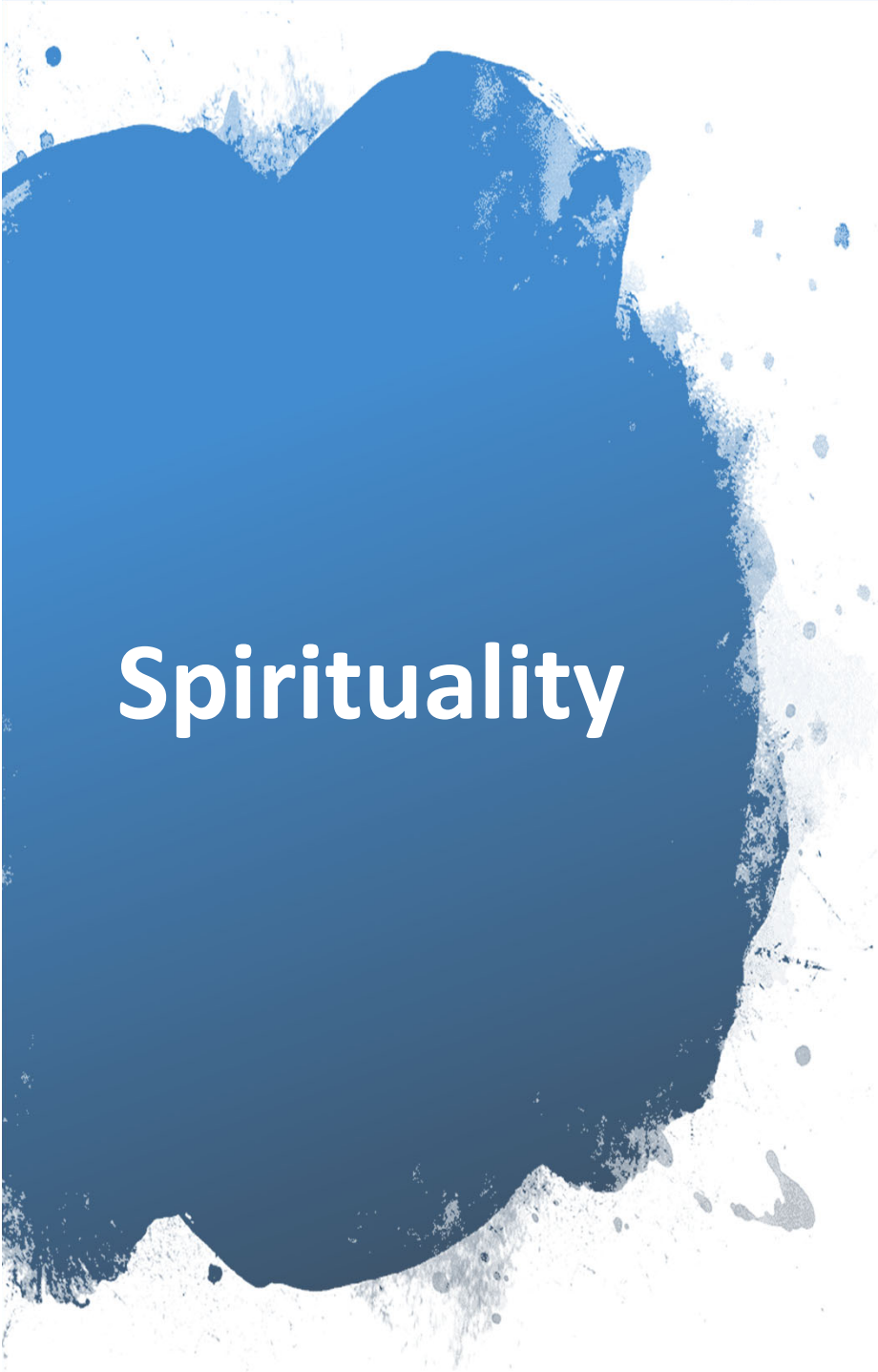
Excellent Resource

- https://www.cancer.org.au/content/about_cancer/ebooks/aftercancer/Sexuality_intimacy_and_cancer_booklet_May_2016.pdf



- FICA Tool
- Very individualized for the patient and the therapist
- How have you addressed spirituality in your practice?

Spirituality



Spirituality

- Sadati et al., (2015) studied religion as an empowerment context with women diagnosed with breast cancer. They reported that religious concepts or beliefs and behaviors associated with religion are heightened with regards to interpretation and understanding of having cancer, coping with cancer, and gaining a new concept for life and death.



Body Image Concern

- Many factors contribute to body image concern including amputation of a breast, scarring, lymphedema, loss of hair, sexual dysfunction, chemo-related early menopause, skin changes, and weight changes.
- Having difficulty with body image can lead to social isolation, depression, and lack of participation in activities of daily living.
- BREAST-Q

MALE BREAST CANCER

7 FACTS TO KNOW

The main **RISK FACTORS** for breast cancer in men is elevated **ESTROGEN** levels, prior **RADIA-TION** exposure, and a **FAMILY HISTORY** of breast cancer.

Male breast cancer is a **RARE** cancer type and only comprises 1% of all breast cancers.

The most common **SYMPTOM** of male breast cancer is a **LUMP** behind the nipple.

SURGERY is the most common initial treatment for male breast cancer. Other treatments include chemotherapy, hormonal therapy and radiation therapy.

Like breast cancer in women, the **PROGNOSIS** for male breast cancer largely depends on the **TUMOR STAGE**.

Male breast cancer **STAGING** (reflecting the degree of tumor spread) is identical to female breast cancer.

The most common type of male breast cancer is **INFILTRATING DUCTAL CARCINOMA**.

EMPOWERED DOCTOR

Cognitive Impairments

75% of active treatment survivors experience cognitive impairment

Up to 35% of cancer survivors experience change in cognitive function after treatment has ended and can persist for as long as 20 years (Runowicz et al., 2016; Janelains, Kesler, Ahles, and Morrow (2014).



Cognitive Impairments

- Rivermead Behavioral Memory Test
- RBMT-3 includes 14 subtests assessing aspects of visual, verbal, recall, recognition, immediate and delayed everyday memory
- Prospective memory skills and the ability to learn new information are measured
- Takes approximately 30 minutes to complete and retesting can be completed with Version 2 of the tool

Work, Productivity, Financial

Cancer survivors can experience difficulties returning to work and accomplishing a level of productivity similar to their healthy counterparts due to the physical and emotional changes.

In addition to lost wages, patients also fear costs related to the medical treatment of cancer both during treatment and throughout survivorship (Shaitelman et al., 2015).



Work, Productivity, Financial

- Disabilities of the Arm Shoulder and Hand (DASH)
- Work Productivity and Activity Impairment Questionnaire
- Rehab: correct or diminish the impairment to assist with return to work or consider vocational rehab

Long-Term Survivorship Concerns

- Up to 80% of survivors will regain full life expectancy; therefore, they should do so with full functional abilities, free from disability from cancer treatments.

(Stout, 2012)



We Have Graduated
From Cancer Rehab!