



# INFLAMMATION AND CANCER

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UNIVERSITY OF HAWAII  

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CANCER CENTER

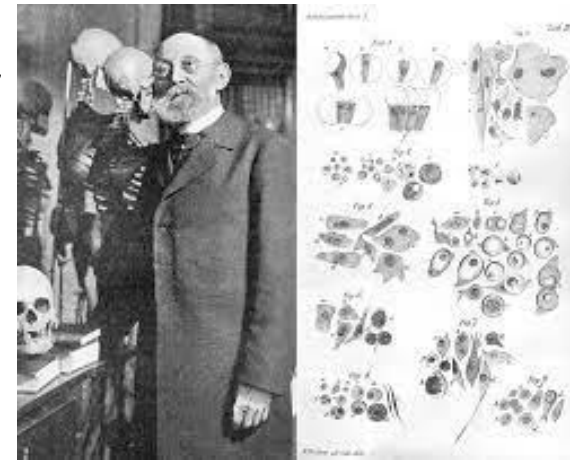
# Outline

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- Inflammation
- Risk factors
- Obesity
- Physical activity
- Diet
- Studies



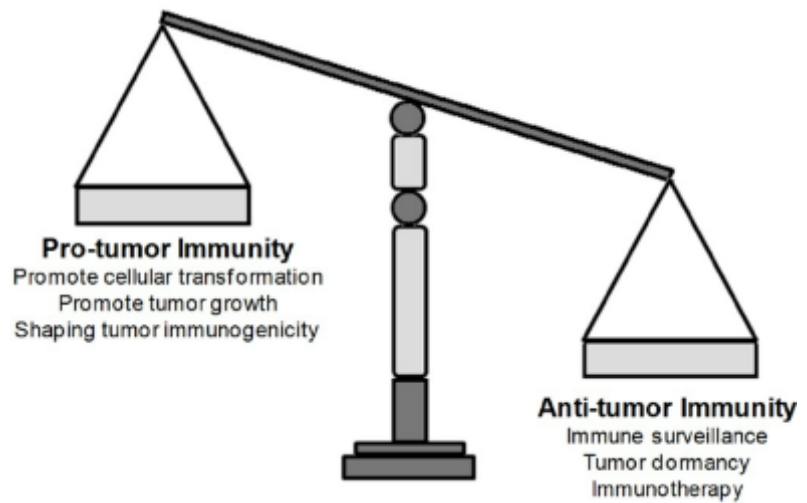
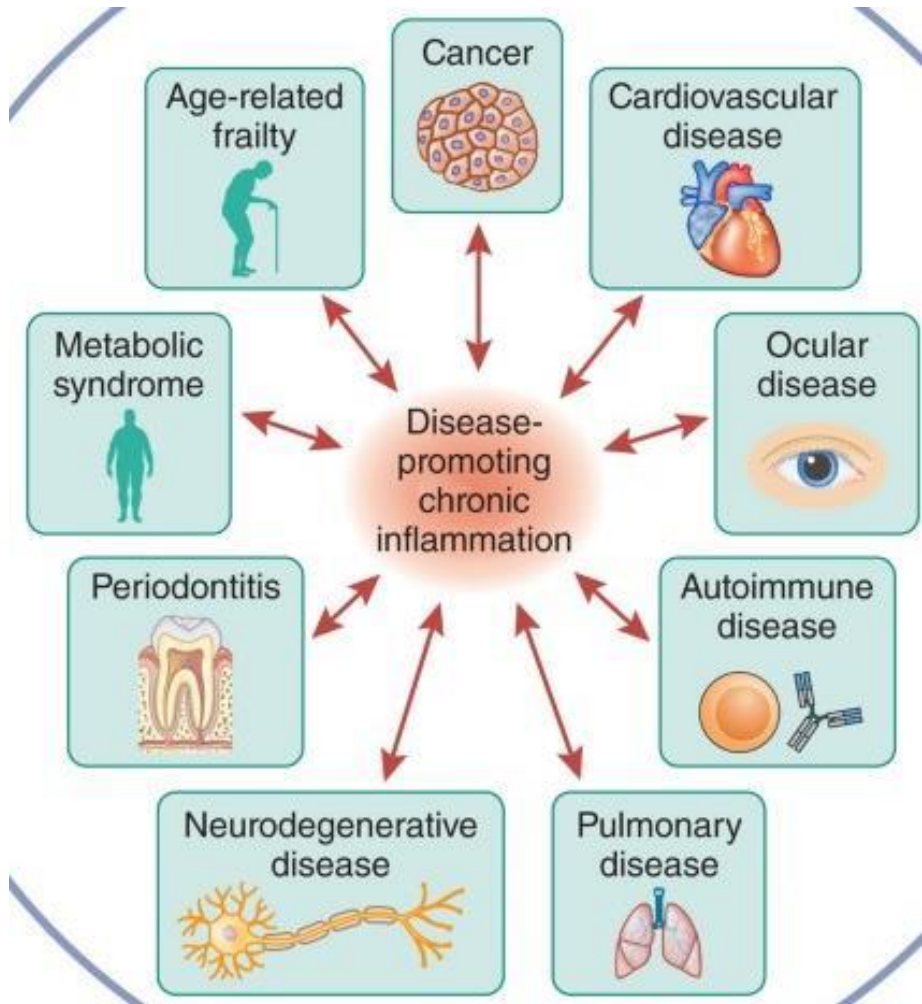
1863 German physician Rudolf Virchow  
White blood cells- in cancerous tissue,  
inflammation-> cancer



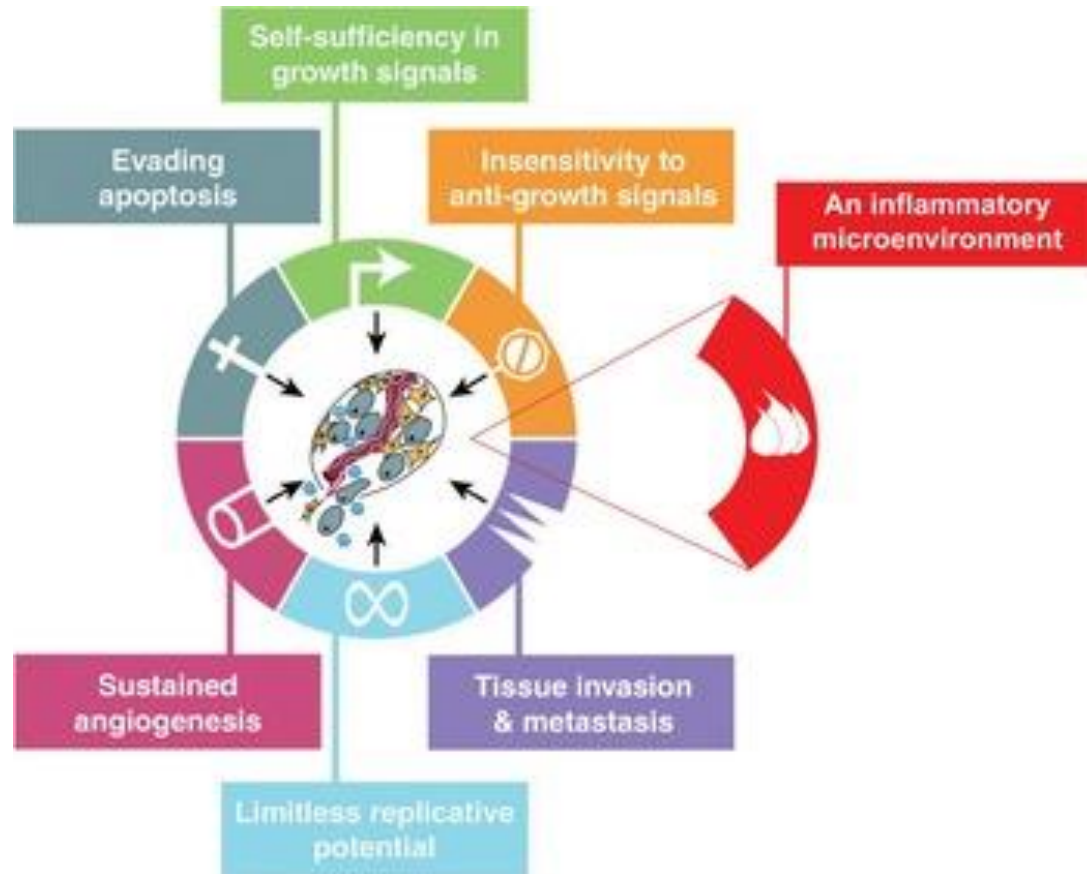
1986 pathologist and vascular  
researcher Harold Dvorak  
Certain WBC-activated at the site of  
injuries



Tumors=“wounds that do not heal”



# Hallmarks of Cancer



# Contributing (Risk) Factors to Cancer

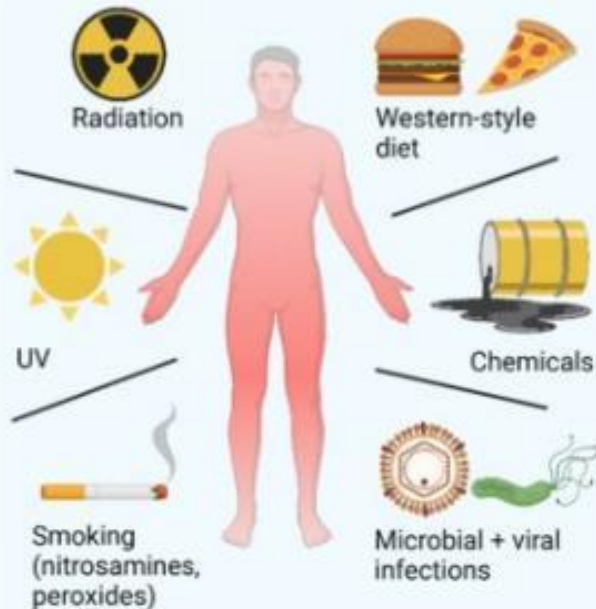
## Cannot be changed

- Age
- Environment
- Genetics
- Hormones
- Immunosuppression
- Radiation

## Can be changed

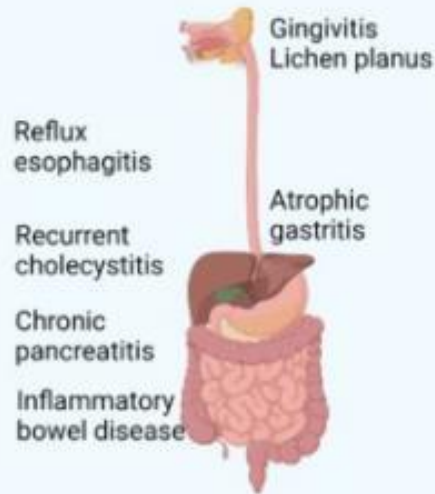
- Obesity
- Physical activity
- Diet & Nutrition
- Alcohol
- Tobacco use
- Infectious agents
- Sunlight

## External triggers



**Local inflammation  
& mutagenesis**

## Internal triggers (gastrointestinal)



**Local inflammation  
& mutagenesis**

## Systemic factors

**Aging & obesity**

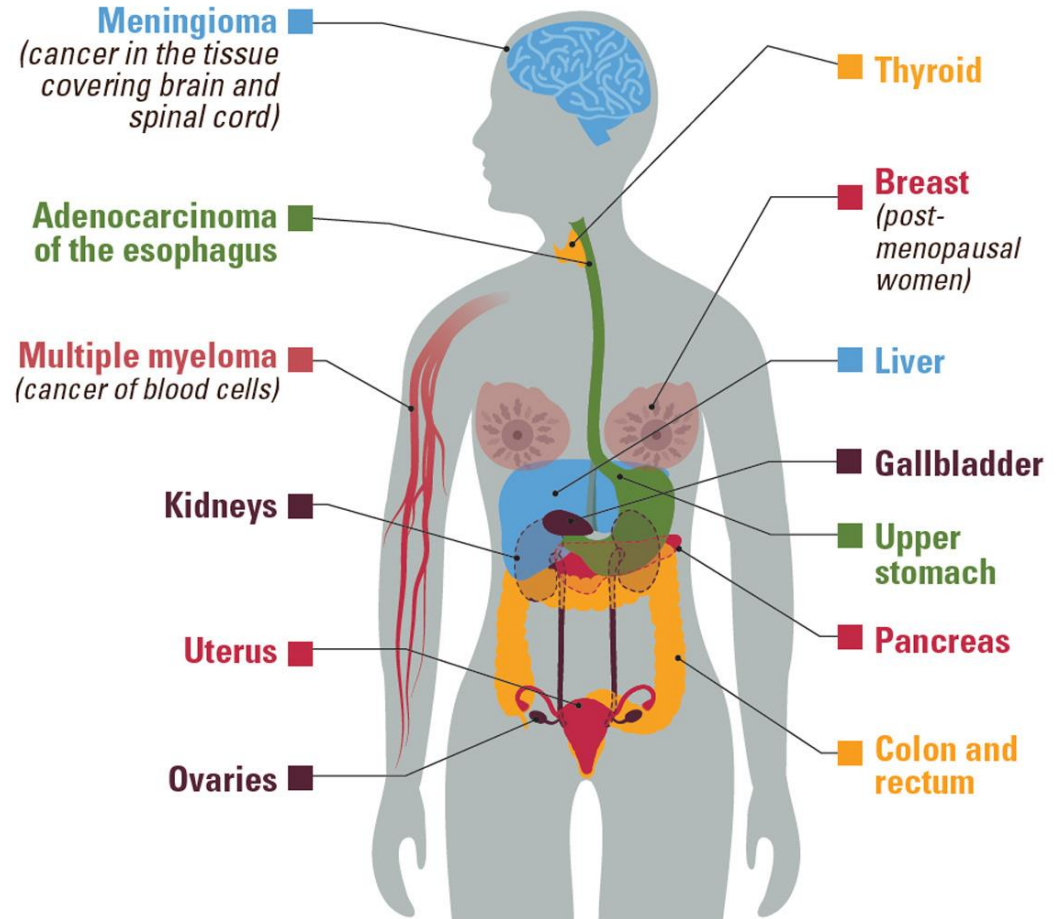


**Systemic inflammation,  
immune dysfunction**



- About 40% of all cancers in the US were associated with overweight/ obesity
- The obesity-related cancers having been increasing

## 13 cancers are associated with overweight and obesity

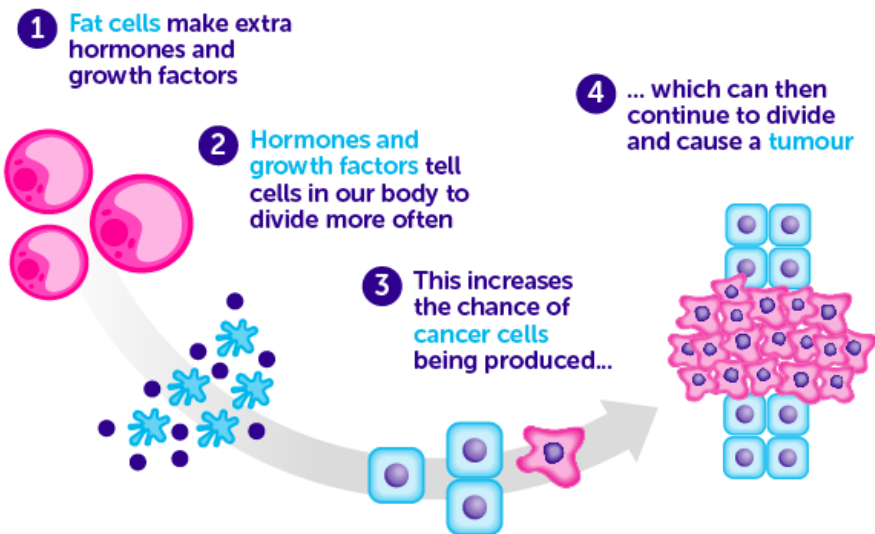




# How Might Obesity Cause Cancer?

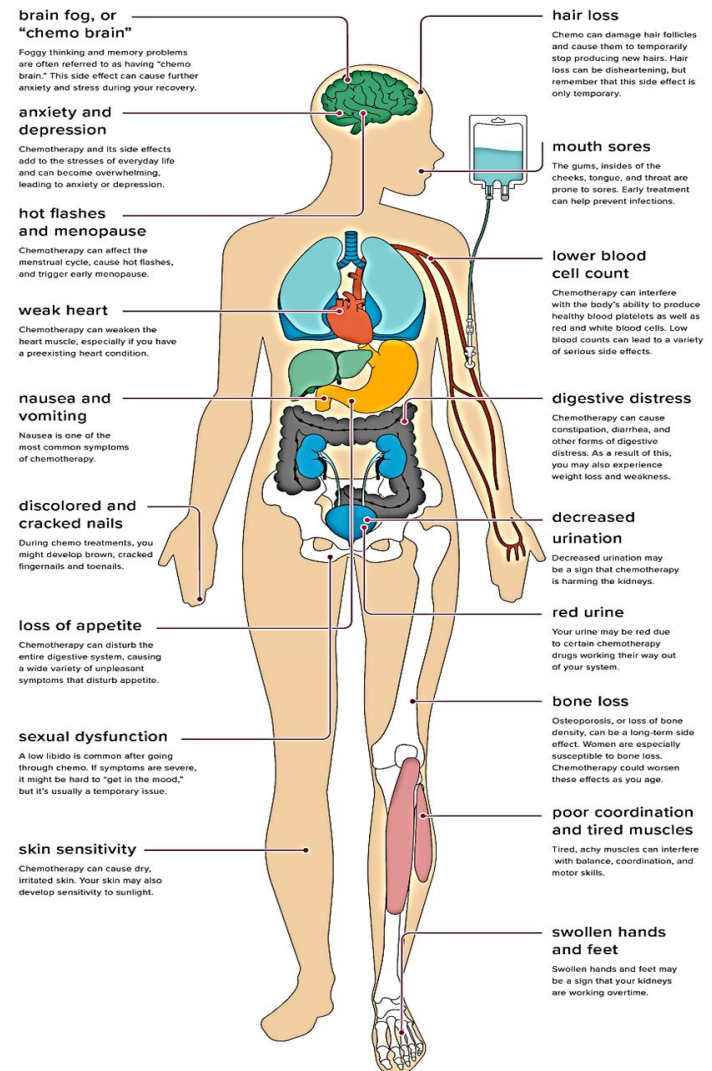
- Chronic low-level inflammation cause DNA damage->cancer
- Fat tissue->estrogen can increase risks of breast, endometrial, ovarian cancers
- Increased blood levels of insulin and insulin-like growth factor-1 may promote colon, kidney, prostate, and endometrial cancers

## HOW COULD BEING OVERWEIGHT CAUSE CANCER?



# Treatment Effects

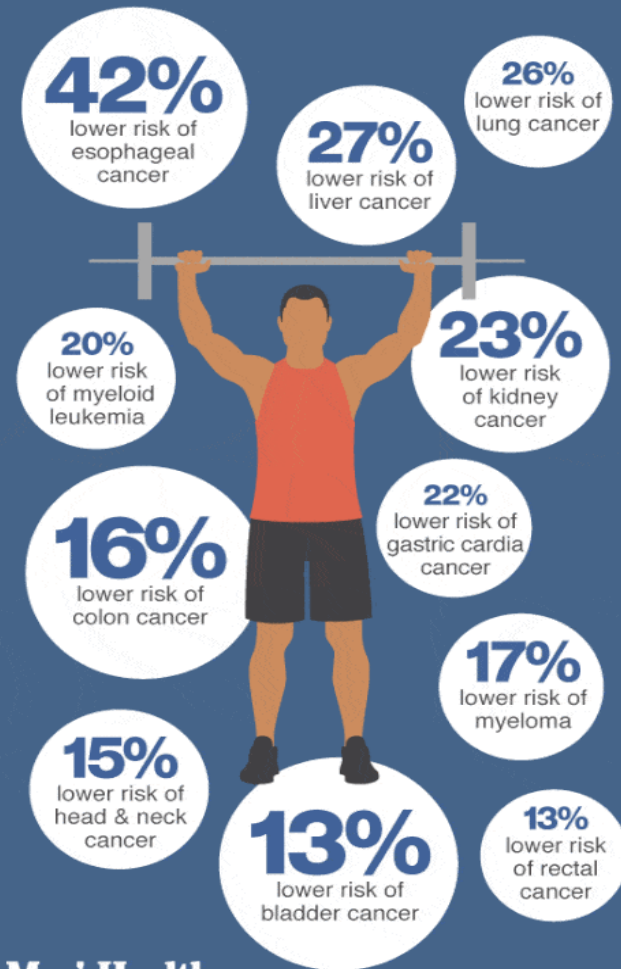
- Surgery
- Chemotherapy
- Radiation
- Anti-hormone/Endocrine therapy
  - Tamoxifen or Aromatase inhibitor (Anastrozole, Letrozole and Exemestane)



- Higher levels of physical activity are linked to lower risk of several types of cancer

- Bladder
- Breast
- Colon
- Endometrial
- Esophageal
- Kidney
- Stomach

## Why You Should Exercise



# STAY STRONG Oncology Rehab Program



The **STAY STRONG Oncology Rehab Program** was developed to improve the physical wellbeing of our patients undergoing cancer treatment, which have physical side effects that can alter quality of life. The goal is to help you maintain your physical strength and stamina to continue with activities you enjoy.

Our program pairs you with a Kapi'olani Women's Center physical therapist, who is a certified oncology rehabilitation specialist. They will create a personalized exercise program that will help you regain your strength while undergoing treatment.

## How Does This Work?

1. **ASK** your provider for information about the program and to schedule an appointment.
2. **SCHEDULE** an evaluation with our physical therapy team.
3. **PERFORM** your recommended exercise program two to three times per week or as recommended for 20-30 minutes.
4. **RECEIVE FOLLOW-UP** support from the physical therapy team, at least once a month during your treatment. Frequency can change as needed to help you return to an active lifestyle.

## Why Should I Participate?

- **MAINTAIN** energy and stamina throughout your treatment.
- **STRENGTHEN** muscles and joints prior to surgery.
- **HEALTHIER** lifestyle.

## Is This Program Right For Me?

We are here to help anyone in Hawai'i who is:

- Planning to undergo treatment for cancer:
  - Surgery
  - Chemotherapy
  - Radiation
  - Endocrine therapy
- Completed treatment for cancer with these symptoms:
  - Fatigue
  - Generalized weakness
  - Neuropathy
  - Difficulty with Balance

The Kapi'olani Oncology Rehabilitation Team will work closely with your cancer care team to create a rehabilitation treatment plan specifically designed just for you.

**For more information, please call 983-6090.**

**HAWAII  
PACIFIC  
HEALTH**

**KAPI'OLANI  
MEDICAL CENTER**  
FOR WOMEN & CHILDREN



1319 Punahou Street | Honolulu, Hawai'i 96826  
T 808.983.6090 | F 808.957.9700 | Kapiolani.org

CREATING A HEALTHIER HAWAII





## Breast Cancer Exercise Rehabilitation Research Study

The University of Hawaii Cancer Center, the Rehabilitation Hospital of the Pacific along with the University of Hawaii Kinesiology and Rehabilitation Science Department are collaborating in a study to show how exercise improves the health, fitness and quality of life for breast cancer patients and may lead to body composition changes.

<p><b>WHY PARTICIPATE?</b> <i>Benefits</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Sessions are FREE!</li> <li><input type="checkbox"/> 12 weeks of personalized training sessions (90 minutes each) with professional Kinesiology students (3x/week)</li> <li><input type="checkbox"/> Continued 12 weeks of either personalized training sessions or group sessions (90 minutes each, 2x/week)</li> <li><input type="checkbox"/> Copy of the DXA scan report (fat, lean and bone mass)</li> <li><input type="checkbox"/> Complete blood count results</li> </ul>
<p><b>HOW DO I QUALIFY?</b> <i>Requirements</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> A medical history of a diagnosis of breast cancer within 2 years, any type of past, current or scheduled medical intervention (surgery, chemotherapy, radiation therapy)</li> <li><input type="checkbox"/> Clearance from your medical oncologist to participate</li> <li><input type="checkbox"/> Able to lay flat on your back for up to 10 minutes</li> <li><input type="checkbox"/> Able to stand without aid for 2 minutes</li> <li><input type="checkbox"/> Do not have any metal implants and is not pregnant</li> </ul>
<p><b>WHAT TO EXPECT</b> <i>Fitness Tests &amp; Measurements</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Several body composition measures will be completed for this study: whole-body DXA, blood draw, optical (2D and 3D) imaging and muscle strength</li> <li><input type="checkbox"/> Lung function</li> <li><input type="checkbox"/> Cardiorespiratory fitness training (treadmill)</li> <li><input type="checkbox"/> Flexibility</li> <li><input type="checkbox"/> Quality of life questionnaires and other related assessments</li> </ul>
<p><b>HOW TO PARTICIPATE:</b>  <i>Choose from any of these options:</i></p>	<ol style="list-style-type: none"> <li>1) Submit a registration form: <a href="http://bit.ly/CancerExerciseStudy1">http://bit.ly/CancerExerciseStudy1</a> And call Matthew Toyama-study coordinator (808) 564-3996</li> <li>2) For the body composition only:             <ul style="list-style-type: none"> <li>■ Contact UHCC Shape Up Study</li> <li>■ Phone: (808) 440-5234   Email: <a href="mailto:bodycompstudies@cc.hawaii.edu">bodycompstudies@cc.hawaii.edu</a></li> </ul> </li> <li>3) Call one of our <b>Program Directors:</b> <ul style="list-style-type: none"> <li>■ <b>Cheri Teranishi-Hashimoto, DPT, MSPT, MS</b> <ul style="list-style-type: none"> <li>○ Program Director - Women's Health &amp; Cancer Rehabilitation</li> <li>○ Ph: (808) 566-3428   Email: <a href="mailto:cheri.teranishi@rehabhospital.org">cheri.teranishi@rehabhospital.org</a></li> </ul> </li> <li>■ <b>Paulette Yamada, PhD</b> <ul style="list-style-type: none"> <li>○ Assistant Professor - Kinesiology &amp; Rehabilitation Science, UH Manoa</li> <li>○ Ph: (808) 956-3638   Email: <a href="mailto:pyamada@hawaii.edu">pyamada@hawaii.edu</a></li> </ul> </li> </ul> </li> </ol>





**REHAB**  
Hospital of the  
Pacific

## Breast Cancer Survivors, We Need You!

**REHAB Hospital of the Pacific**, Hawaii's only premier, acute-care rehabilitation hospital, is conducting a study to determine if an at home body water analyzer can help to detect lymphedema (i.e., swelling in the body caused by the accumulation of protein rich fluid) earlier than with the current standard of care.

### Home Body Water Analyzer Study

#### Benefits You Receive

- Daily at home monitoring of your bodywater levels for a year
- Possible earlier detection of subclinical lymphedema if it starts to develop
- Your contribution to research to help future breast cancer patients and others

#### What We Test For

Physical tests and measures will take approximately one (1) hour for the initial assessment and 15-60 minutes for follow up visits. You will be asked to return at 3 months, 6 months, 9 months and 12 months after your initial assessment. Test and measurements will include:

- Vitals (blood pressure, HR, O<sub>2</sub> saturation)
- Body composition & circumference measurements
- Flexibility (*shoulder active and passive range of motion*)
- Lymphedema and shoulder function related questionnaires

#### Who Can Join?

- Must be 18-years of age or older
- A medical history with a diagnosis of unilateral breast cancer and surgery scheduled in the near future or breast cancer related surgery (i.e. lumpectomy, mastectomy) no longer than 6 months ago

**Scan the QR code, visit the link below or call our Principal Investigator to enroll today!**

<https://forms.gle/aioBS9HJRubrhwNh7>



**Enroll Now!**

#### Principal Investigator

Cheri Teranishi-Hashimoto,  
DPT, MSPT, MS

Women's Health & Cancer

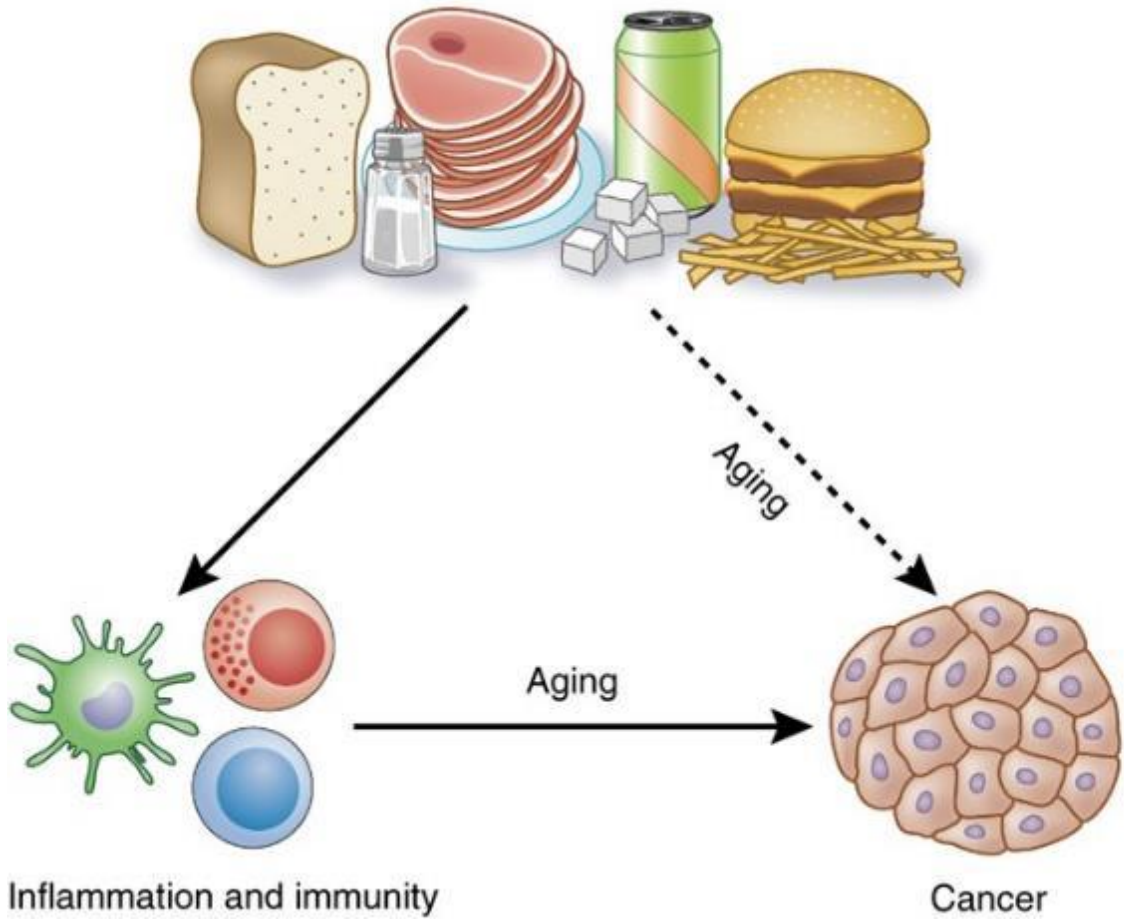
Rehabilitation Program Director

Ph: 808.566.3428 | Fax: 808.535.2018

cheri.teranishi@rehabhospital.org



# Nutrition quality and quantity



Debbie Maizels/Springer Nature

# Diet Recommendations

- Variety of vegetables, fruits (variety of colors)
- Avoid:
  - Processed/red meats, sugar-sweetened drinks, highly processed foods
  - Alcohol, moderation (1 drink/day-women, 2 drinks/day-men)



# Stress Management

Chronic Stress: Examples, Symptoms, & How to Manage It

## Coping Skills for Chronic Stress

- Exercise
- Practice saying no
- Nutritional changes
- Improving sleep
- Self-care
- Learning stress reduction skills
- Developing time management techniques
- Use your vacation time!
- Improving boundaries



# References

## **World Cancer Research Fund/American Institute for Cancer Research**

-update project on food, nutrition, physical activity and cancer

[www.wcrf.org](http://www.wcrf.org)

[www.aicr.org](http://www.aicr.org)

## **American Cancer Society**

-Guidelines for Diet and Physical Activity for Cancer Prevention

-Nutritional and Physical Activity Guidelines for Cancer Survivors

## **American Society of Clinical Oncology (ASCO)**

Obesity and Cancer

Recommendations