



Cancer

MINI MEDICAL SCHOOL

KEVIN FIELD

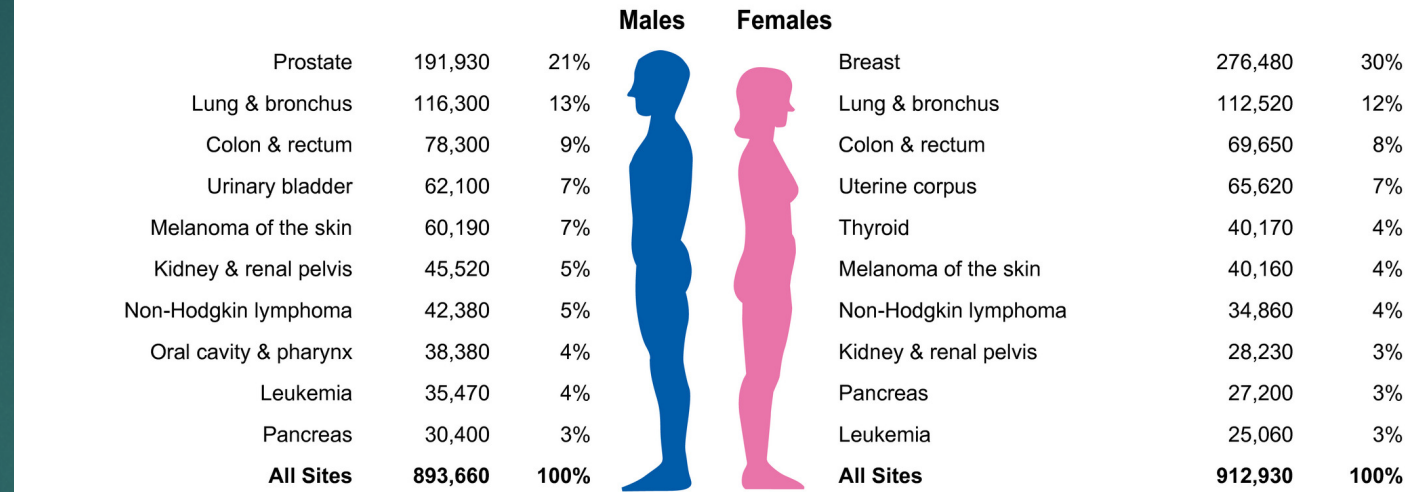
MARCH 2, 2020

Learning Objectives

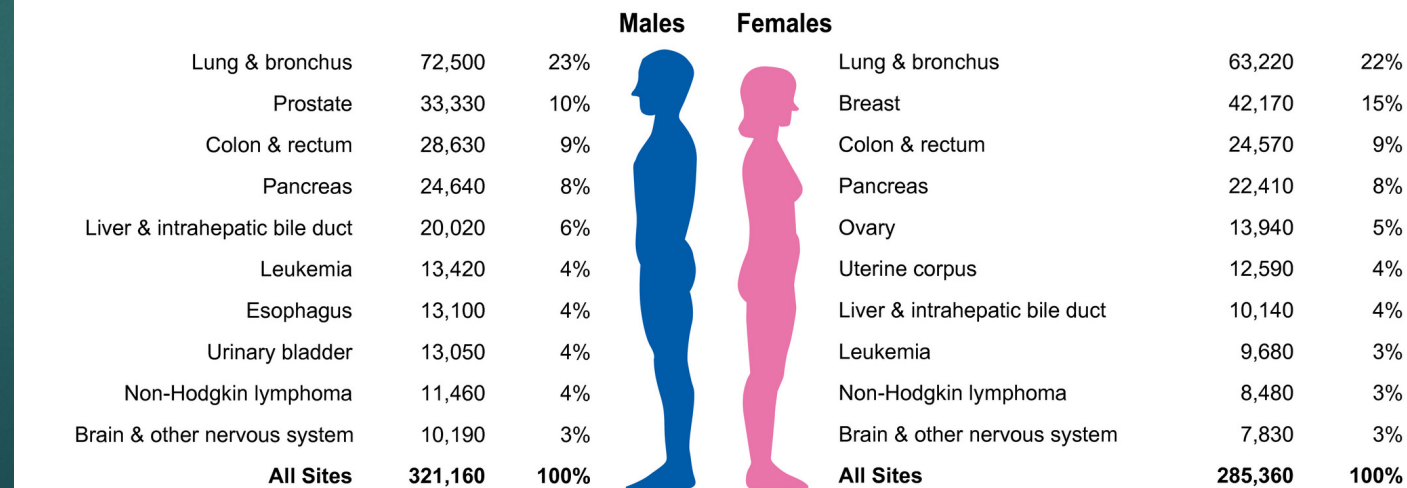
- ▶ To understand how cancer arises from healthy cells
 - ▶ To understand how cancer is diagnosed
 - ▶ To understand common treatments for cancer
-
- ▶ Let us know if something isn't clear or if you have questions!

The burden of cancer

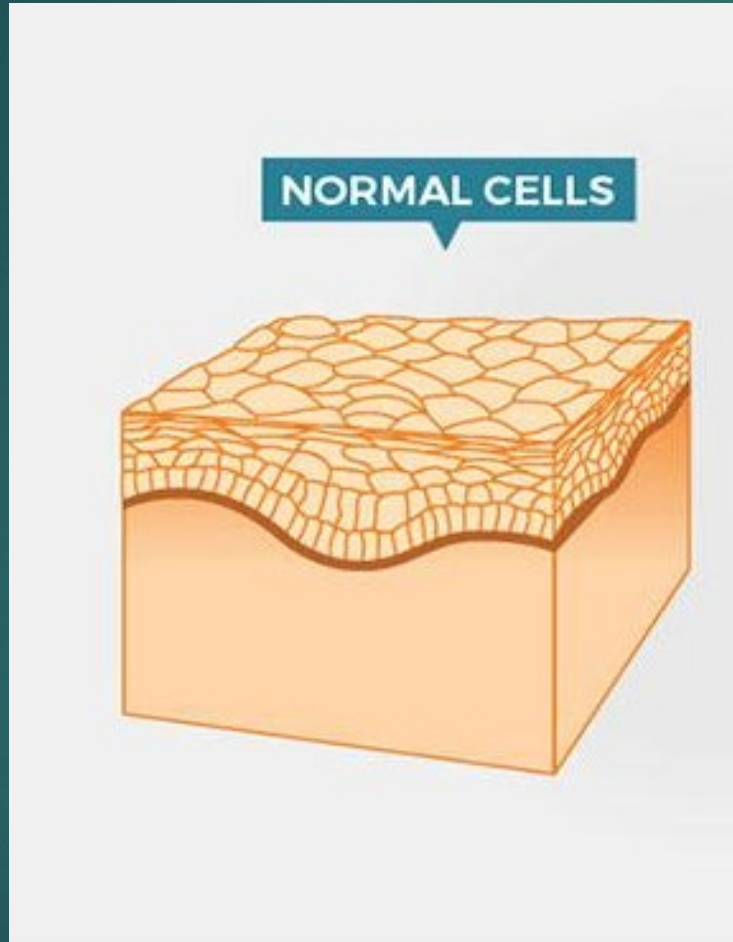
Estimated New Cases



Estimated Deaths

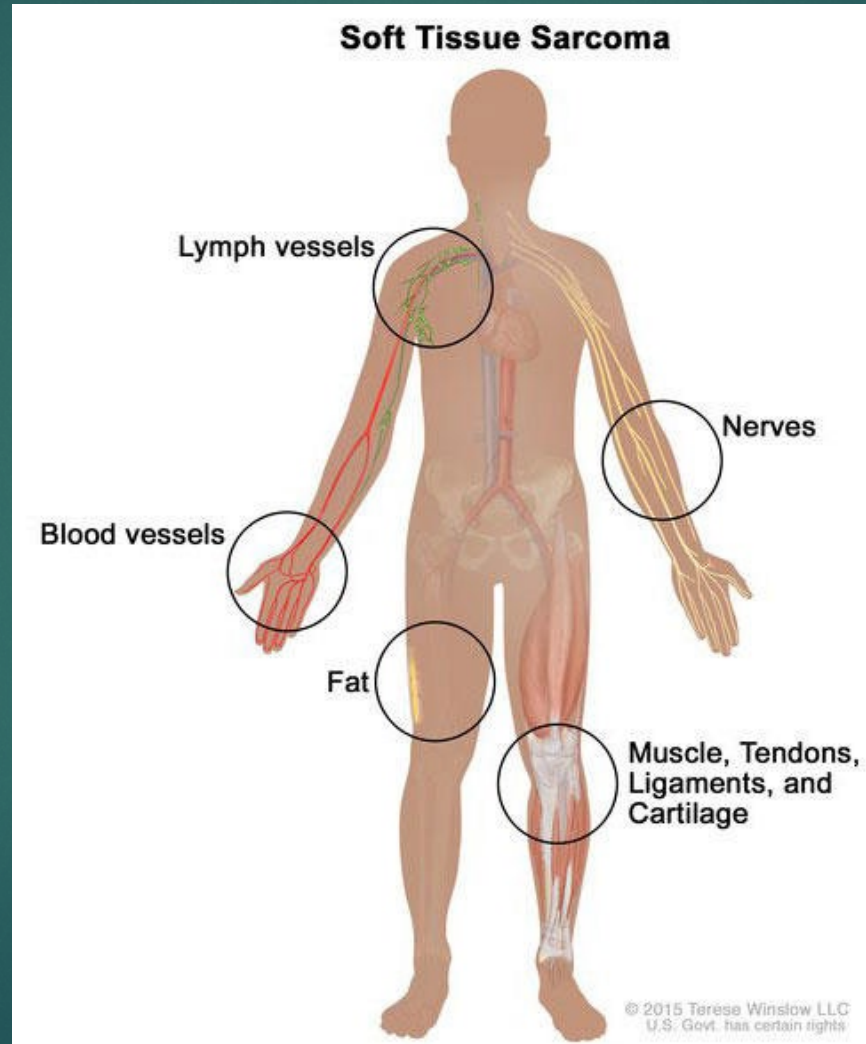


What is cancer?

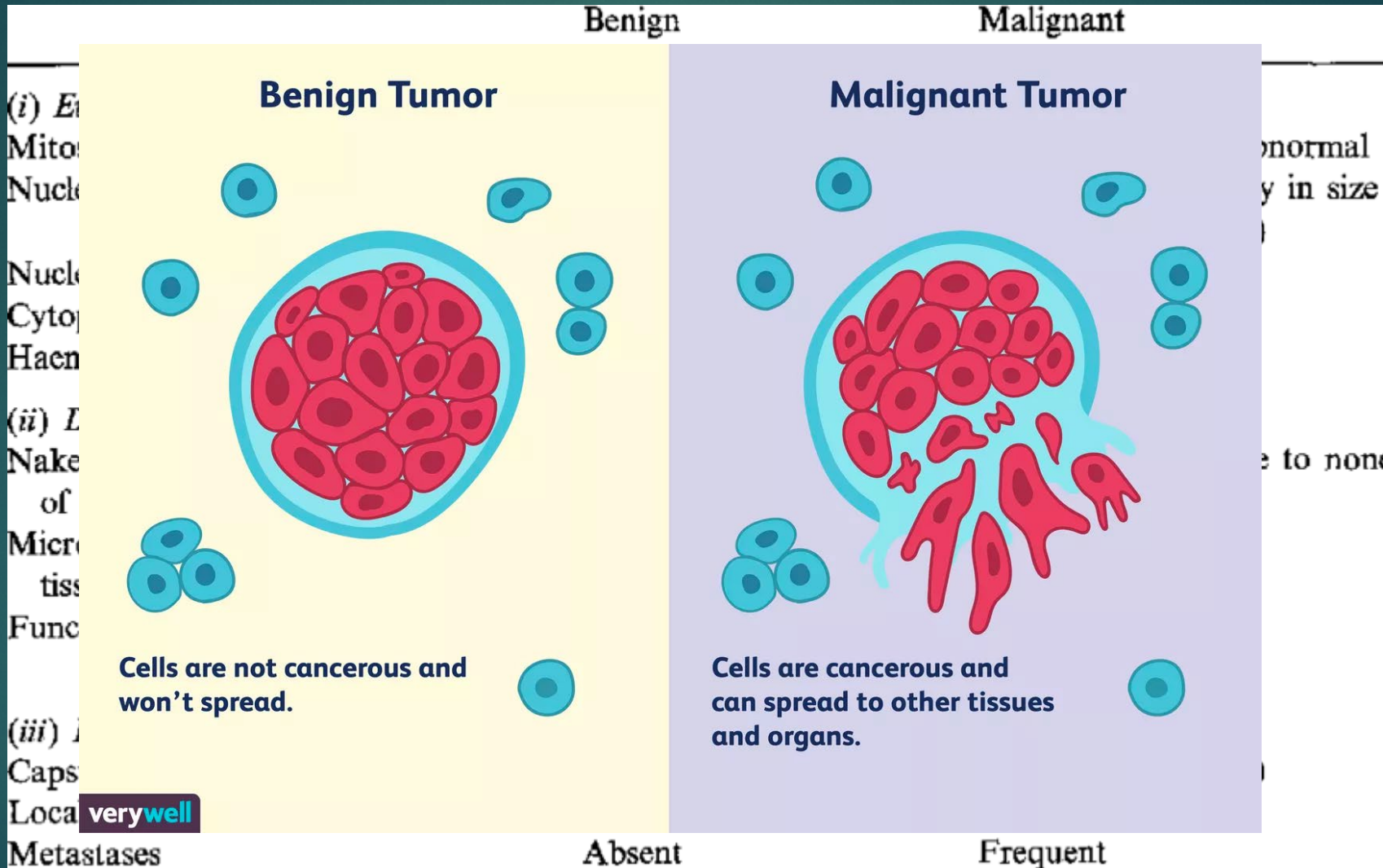


<https://www.cancer.gov/about-cancer/understanding/what-is-cancer>

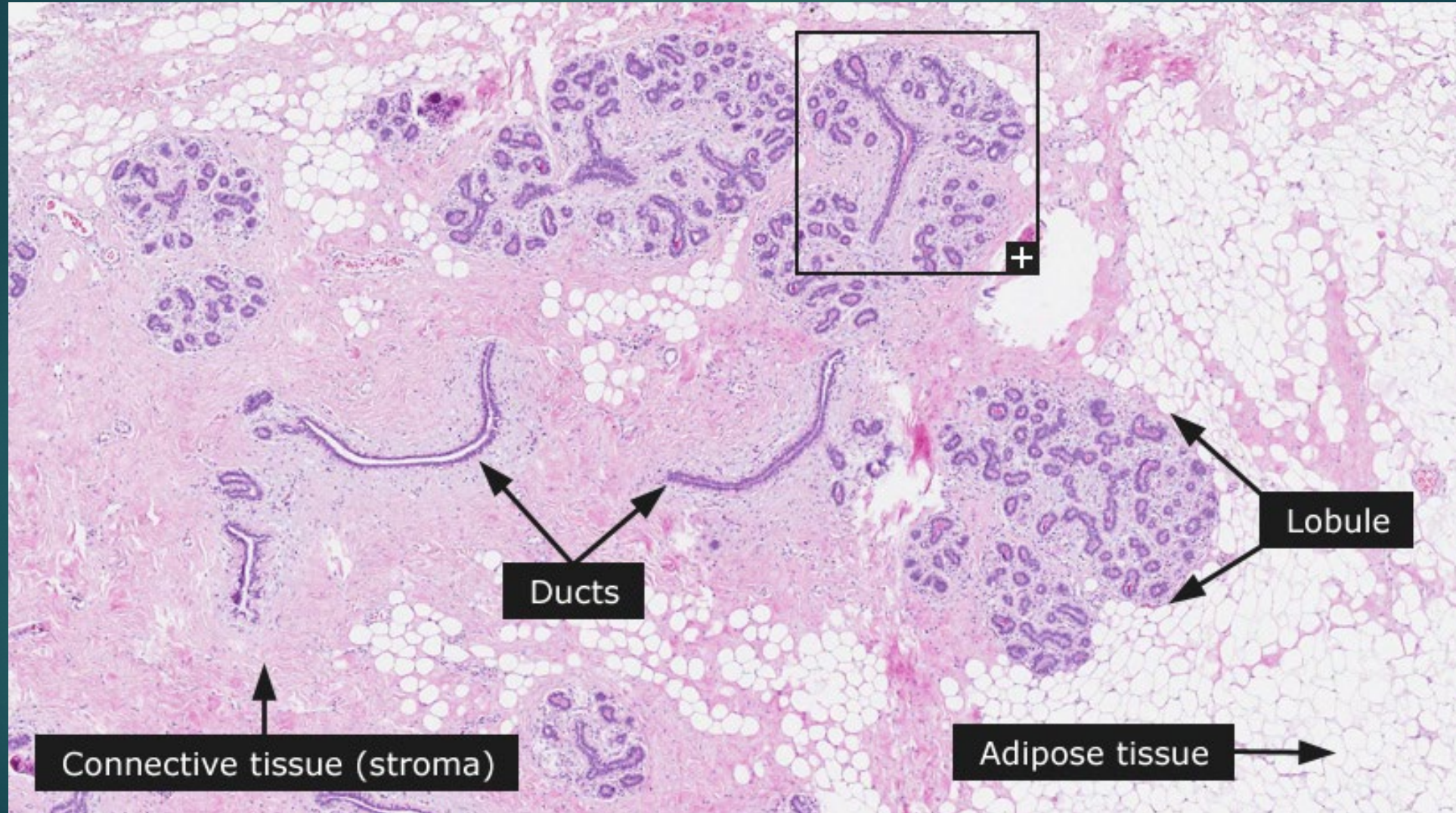
Cancer can occur anywhere in the body



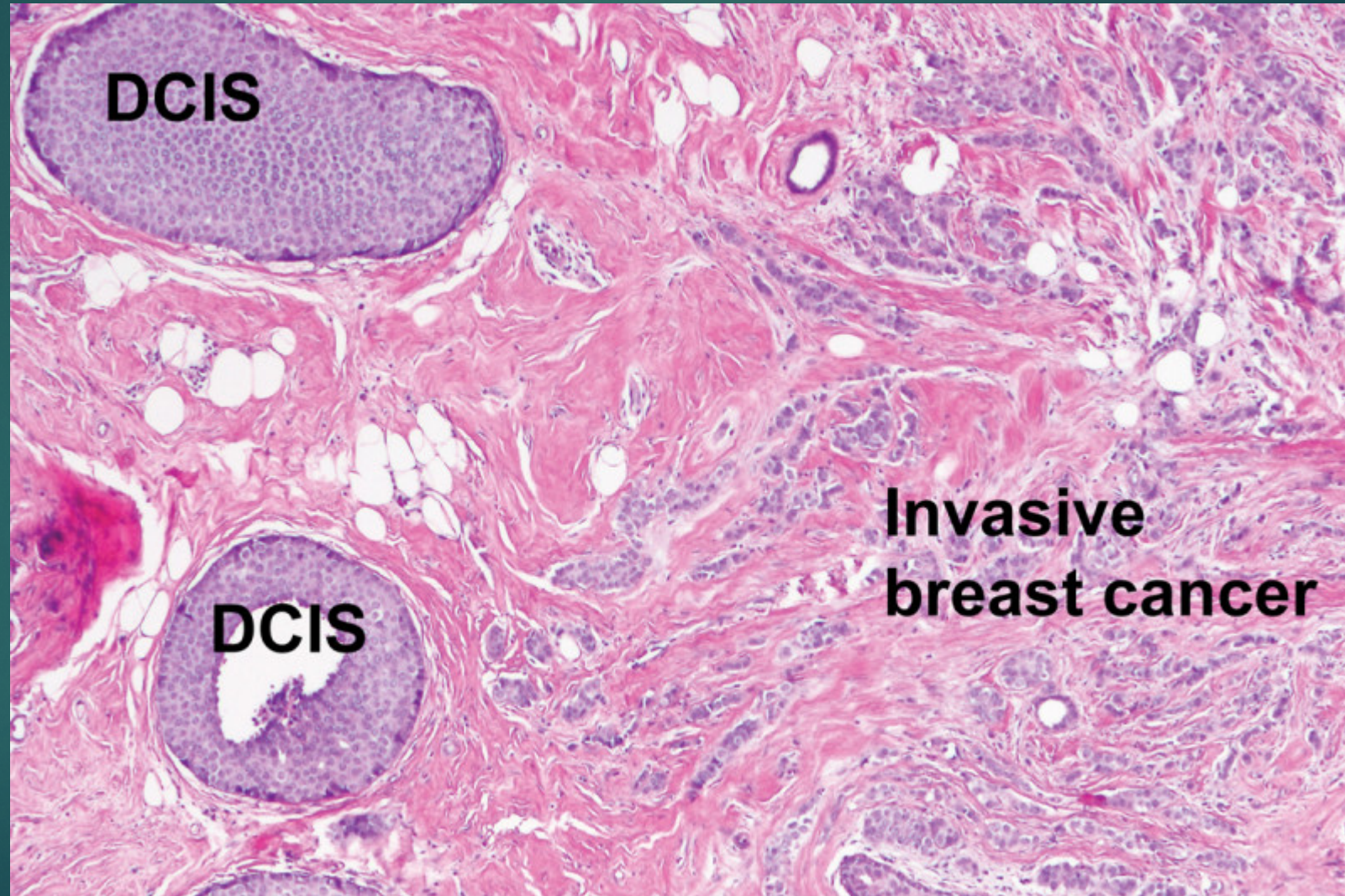
Benign or Malignant?



Normal Breast Histology

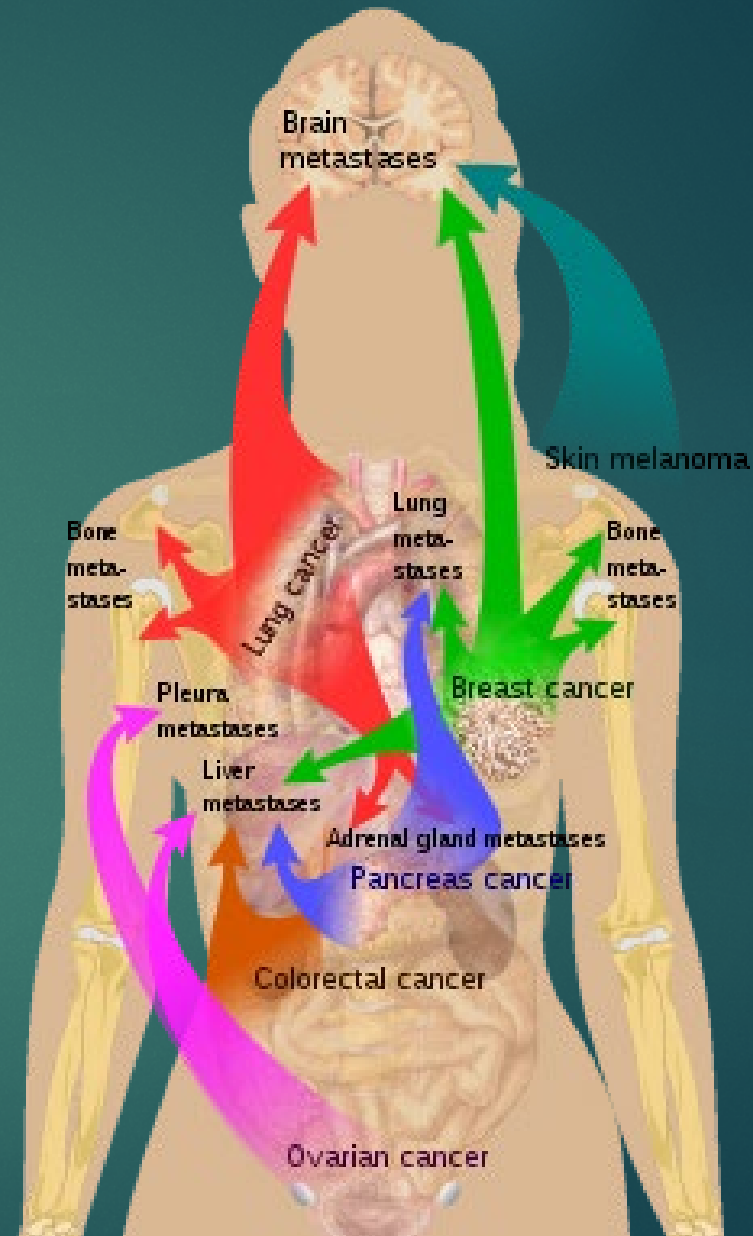


Benign or Malignant?

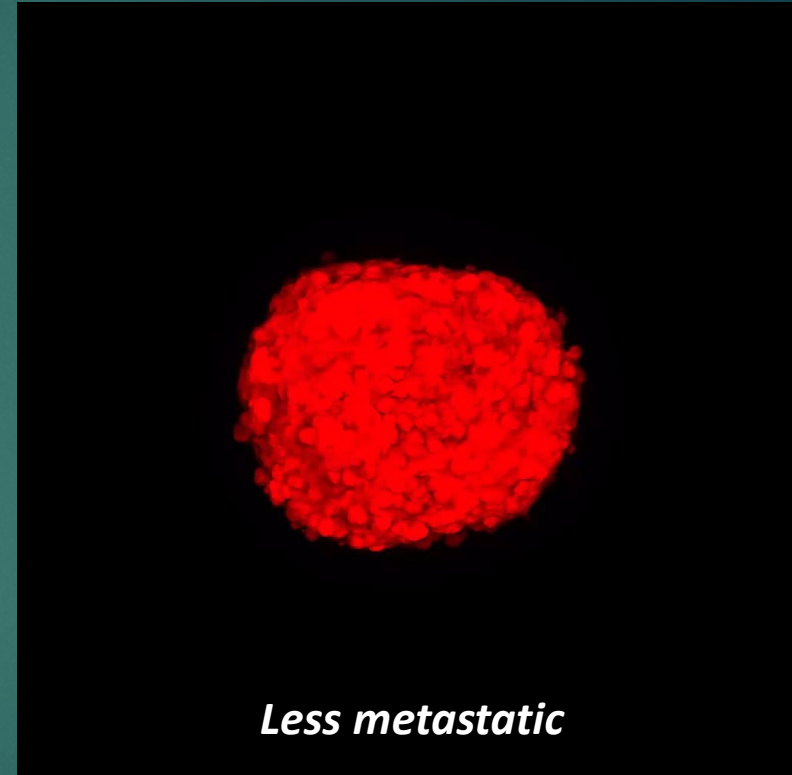
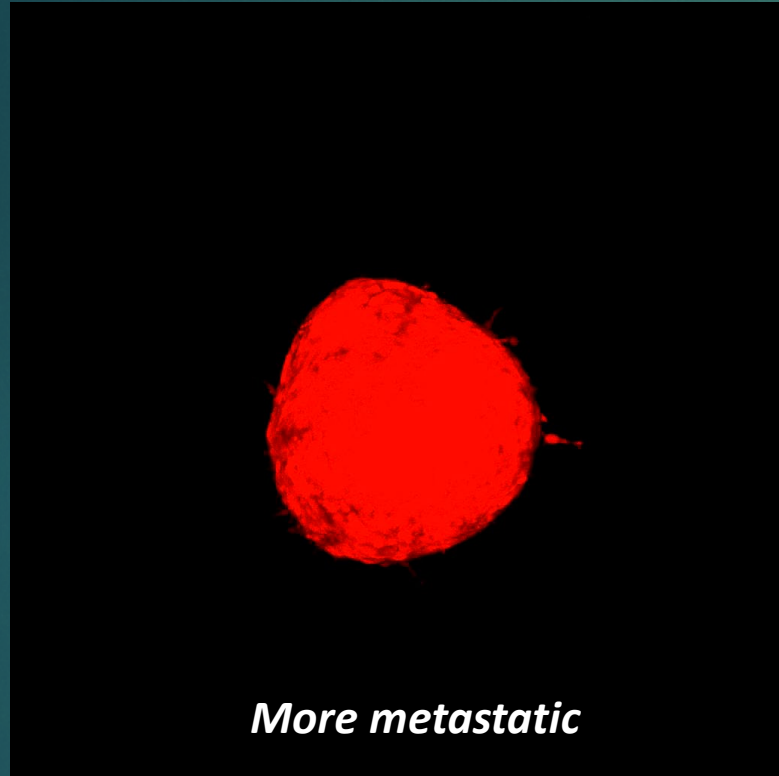


Metastasis

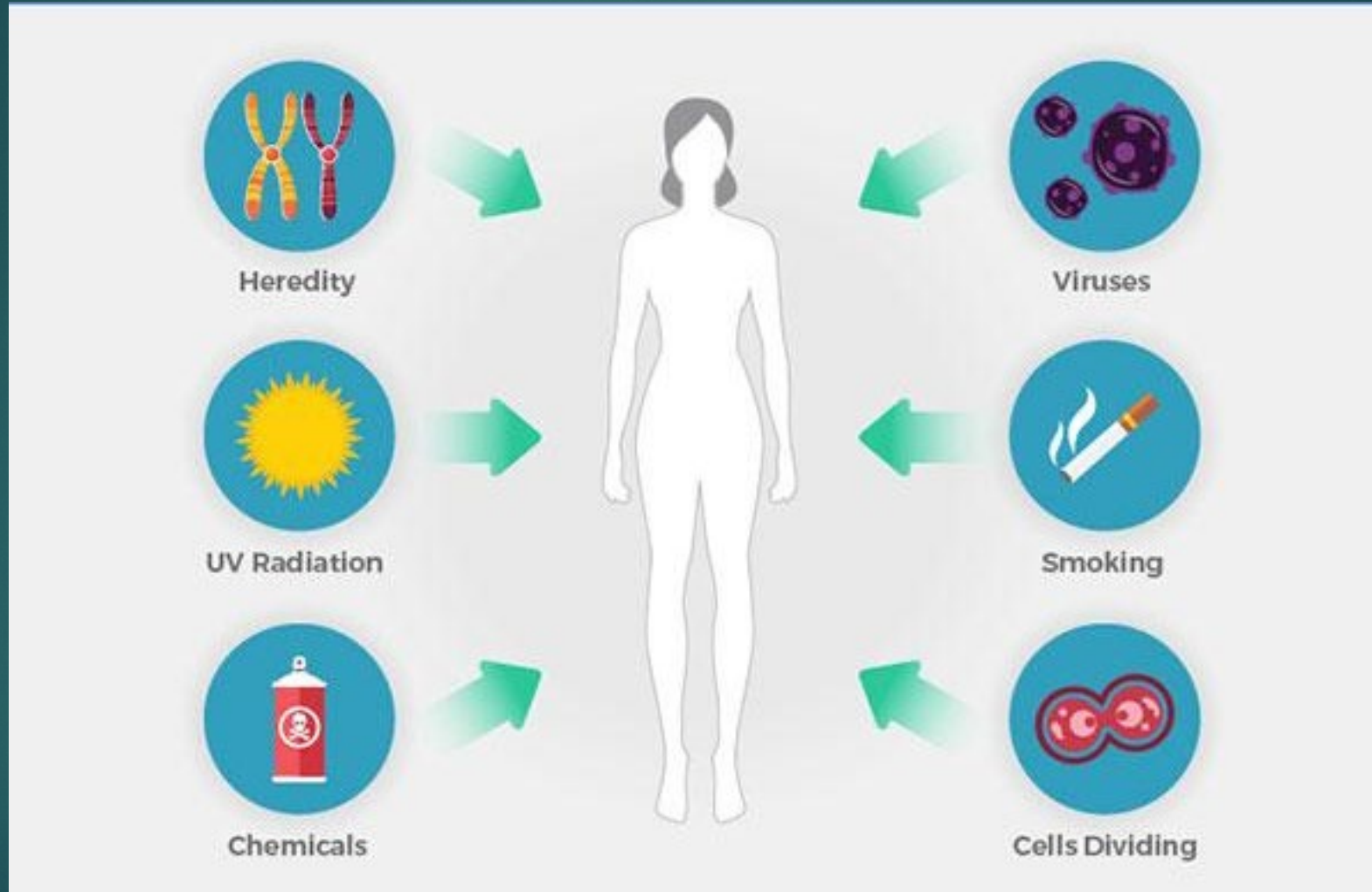
60->90%



Metastatic cells tend to be more invasive



What causes cancer?



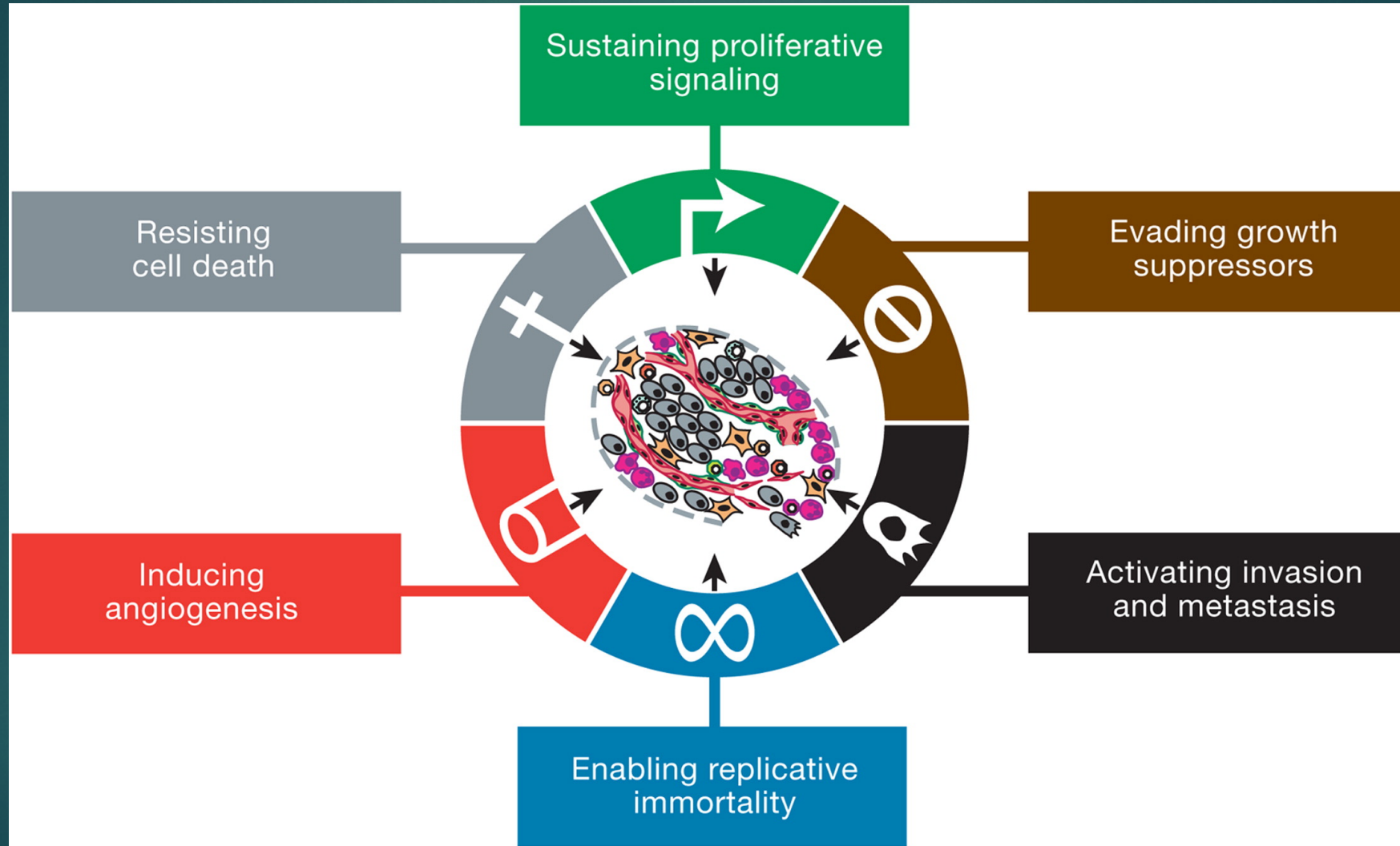
Two biggest factors: Time & Accumulation



<https://www.clipart.email/clipart/sand-timer-clipart-46819.html>

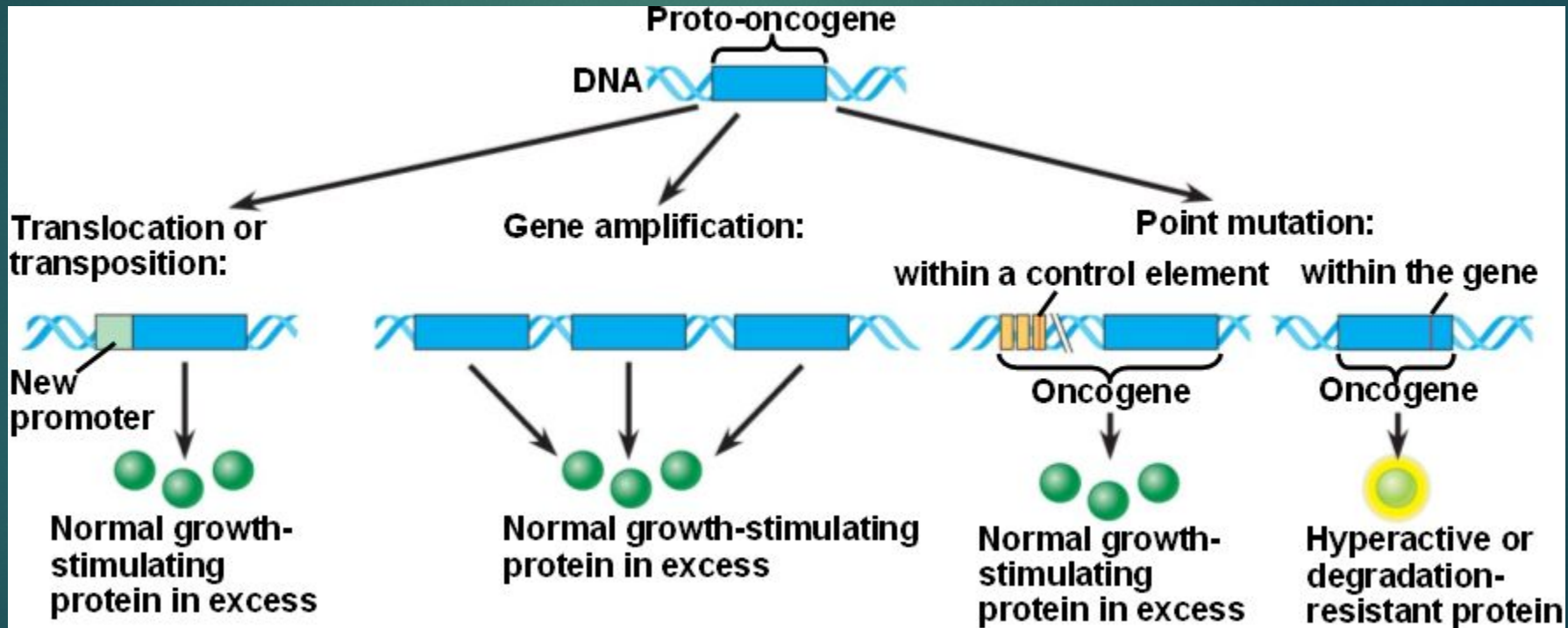
<https://www.shutterstock.com/search/overflowing+cup>

What Drives Cancer?



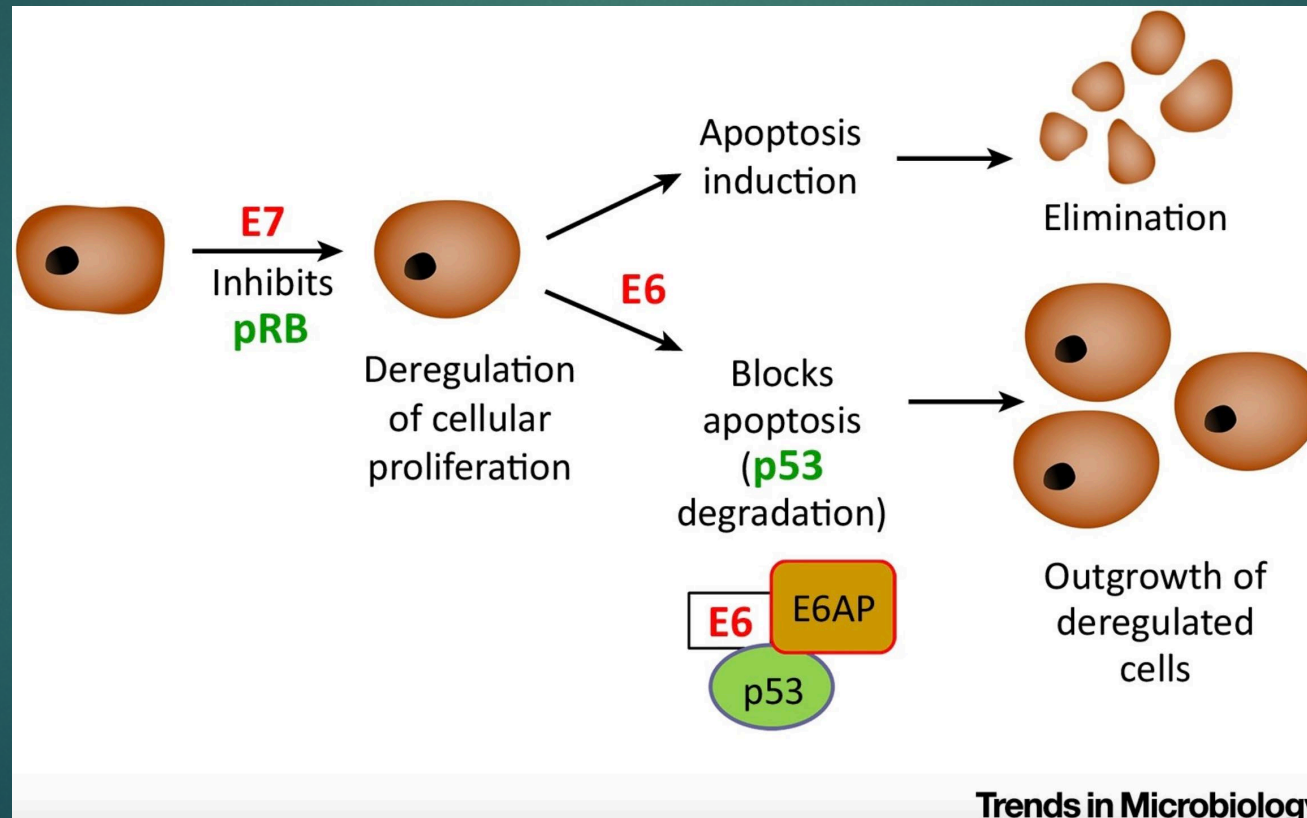
Increased Growth

- ▶ Leukemia, lymphoma, lung, and breast cancer can all possess mutations that activate proto-oncogenes



Resistant to Death

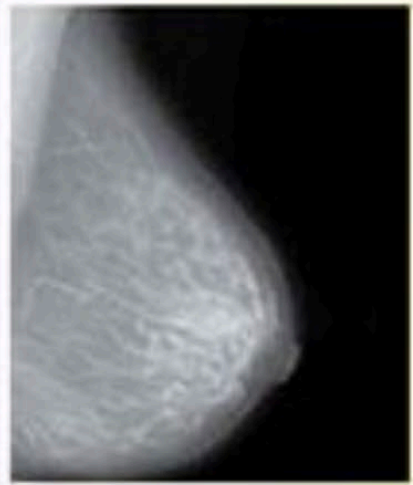
- ▶ Colon cancer, cervical cancer, and lymphoma are examples of cancers that can avoid death or growth suppression



An Overview of Cancer Diagnosis

- ▶ History and Physical Exam
- ▶ Blood work
 - ▶ Especially important for leukemia
- ▶ Diagnostic Imaging

Imaging—Mammogram



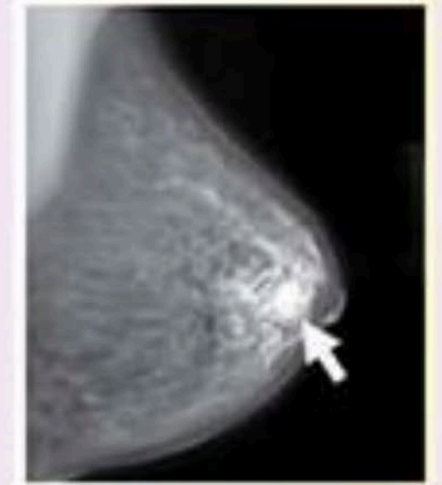
Normal
mammogram



Benign cyst
(not cancer)

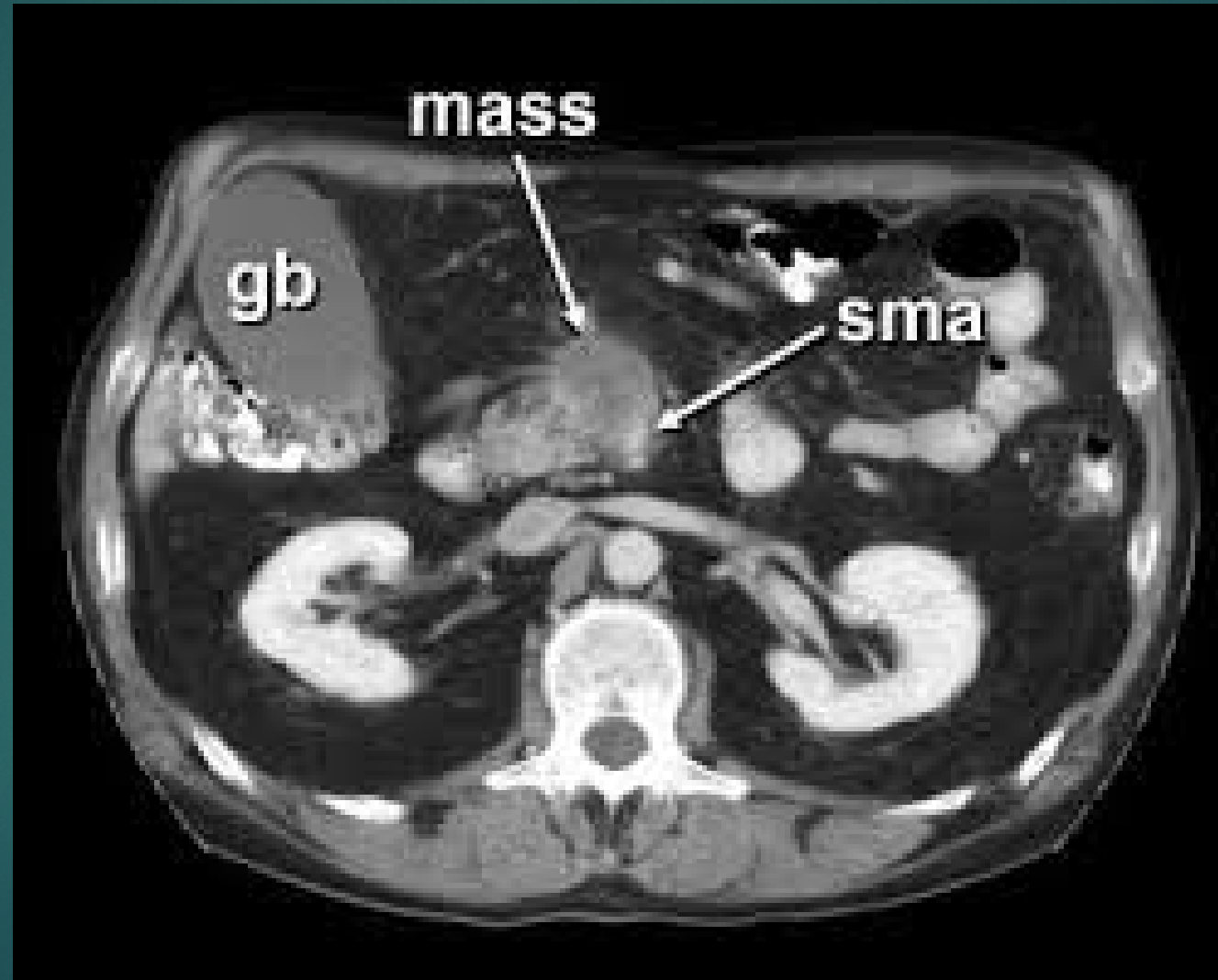


Breast
calcifications

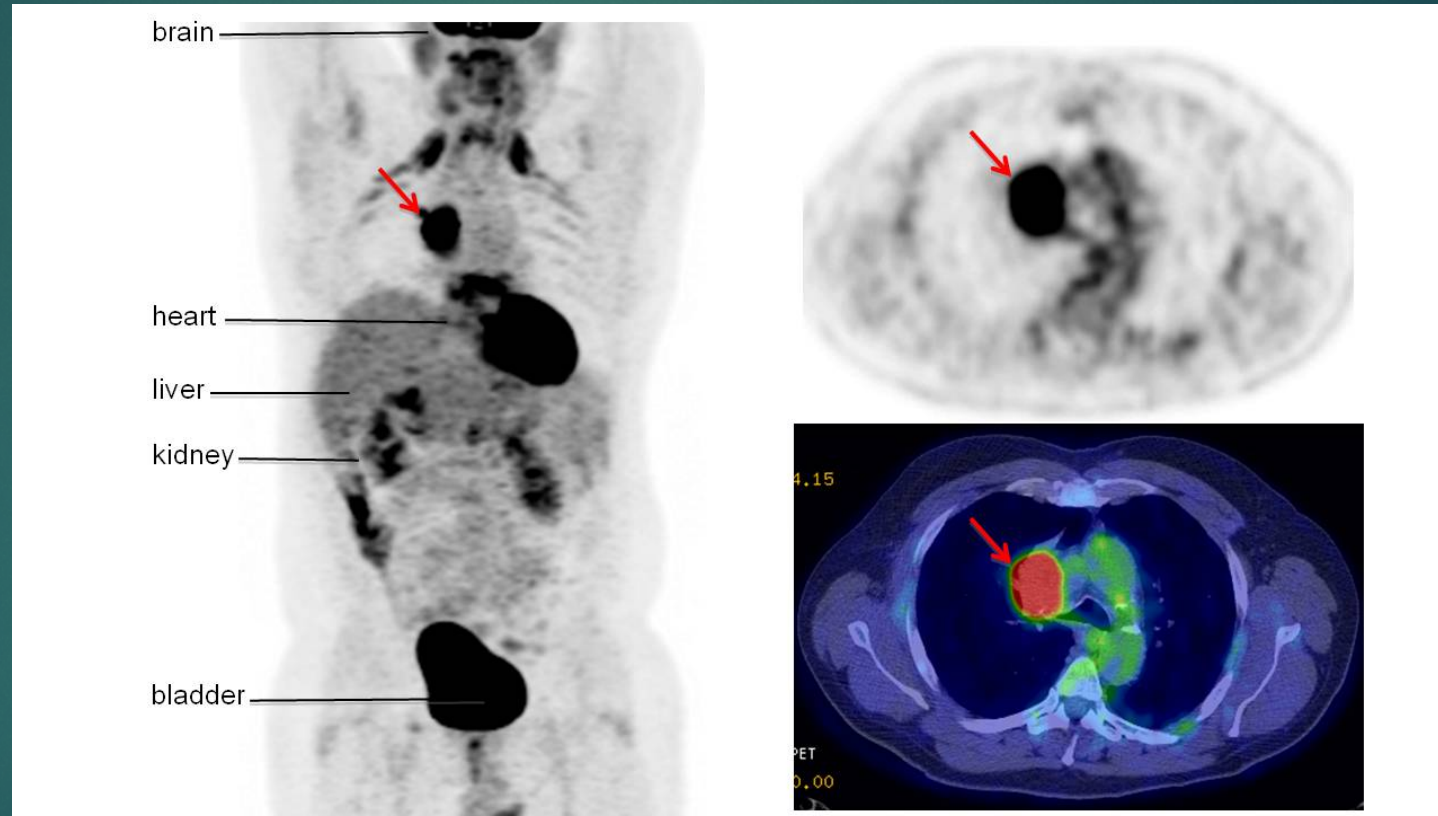


Breast
cancer

Imaging—MRI



Imaging—PET Scan



This 55-year-old smoking man developed a new cough. PET/CT shows a large, active cancer (**arrow**) compressing the bronchus leading to the right lung.

Cancer Treatment: The Big 3

- ▶ Surgery
- ▶ Chemotherapy
- ▶ Radiation Therapy

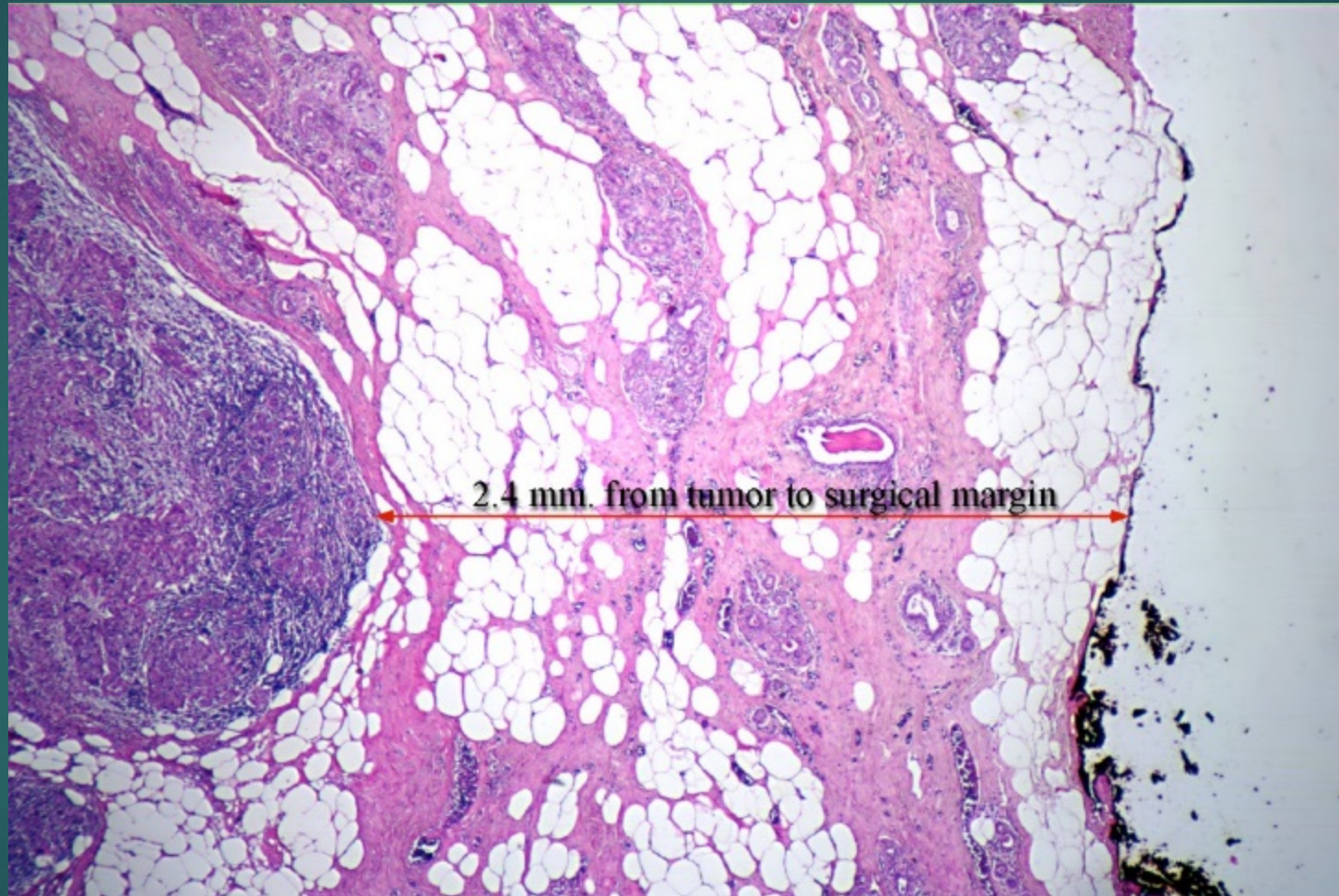
Surgery

- ▶ Excellent option when tumor is localized
- ▶ Requires adjuvant therapy if cancer has spread



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Surgical Margins

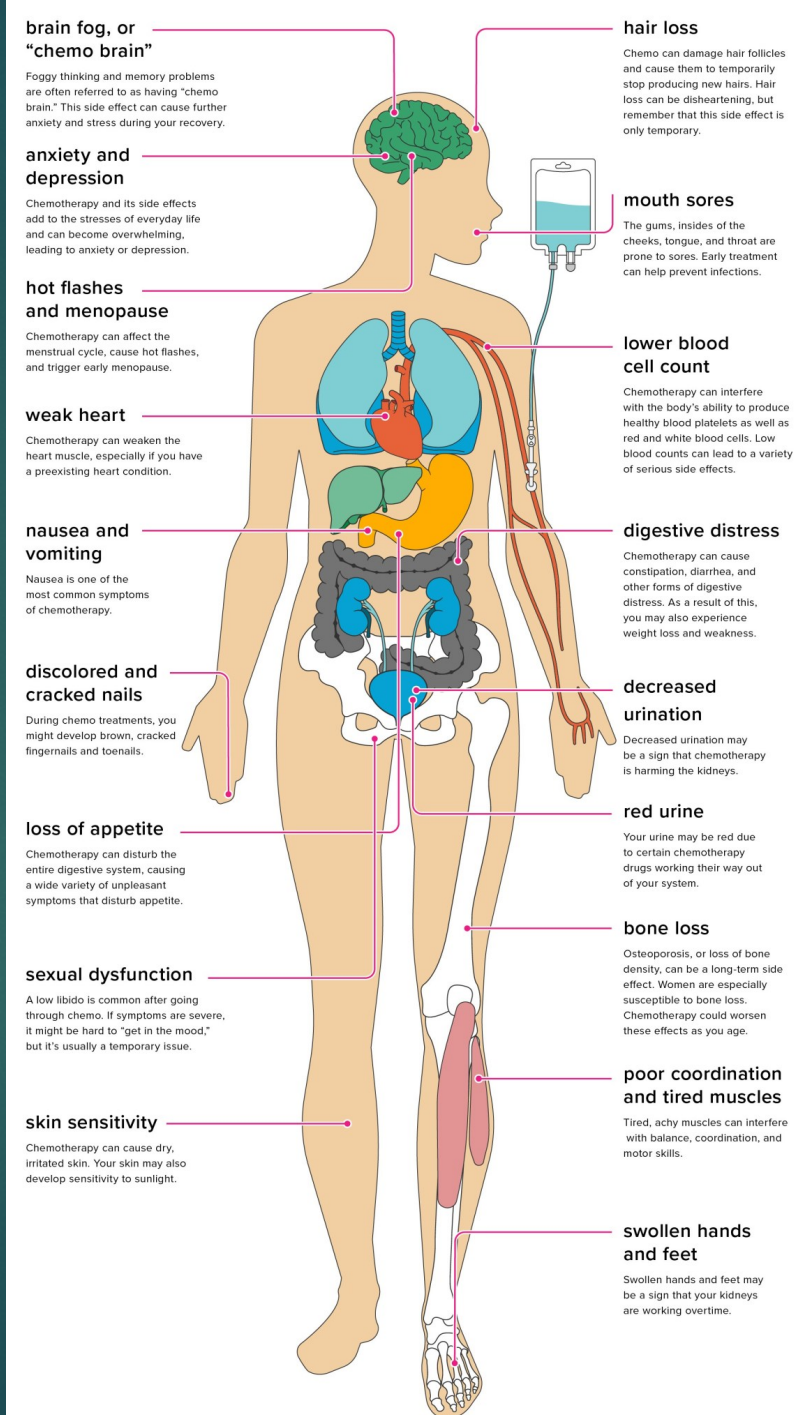


<http://www.askewpathologyconsultation.com/2017/11/24/margins-breast-cancer/>

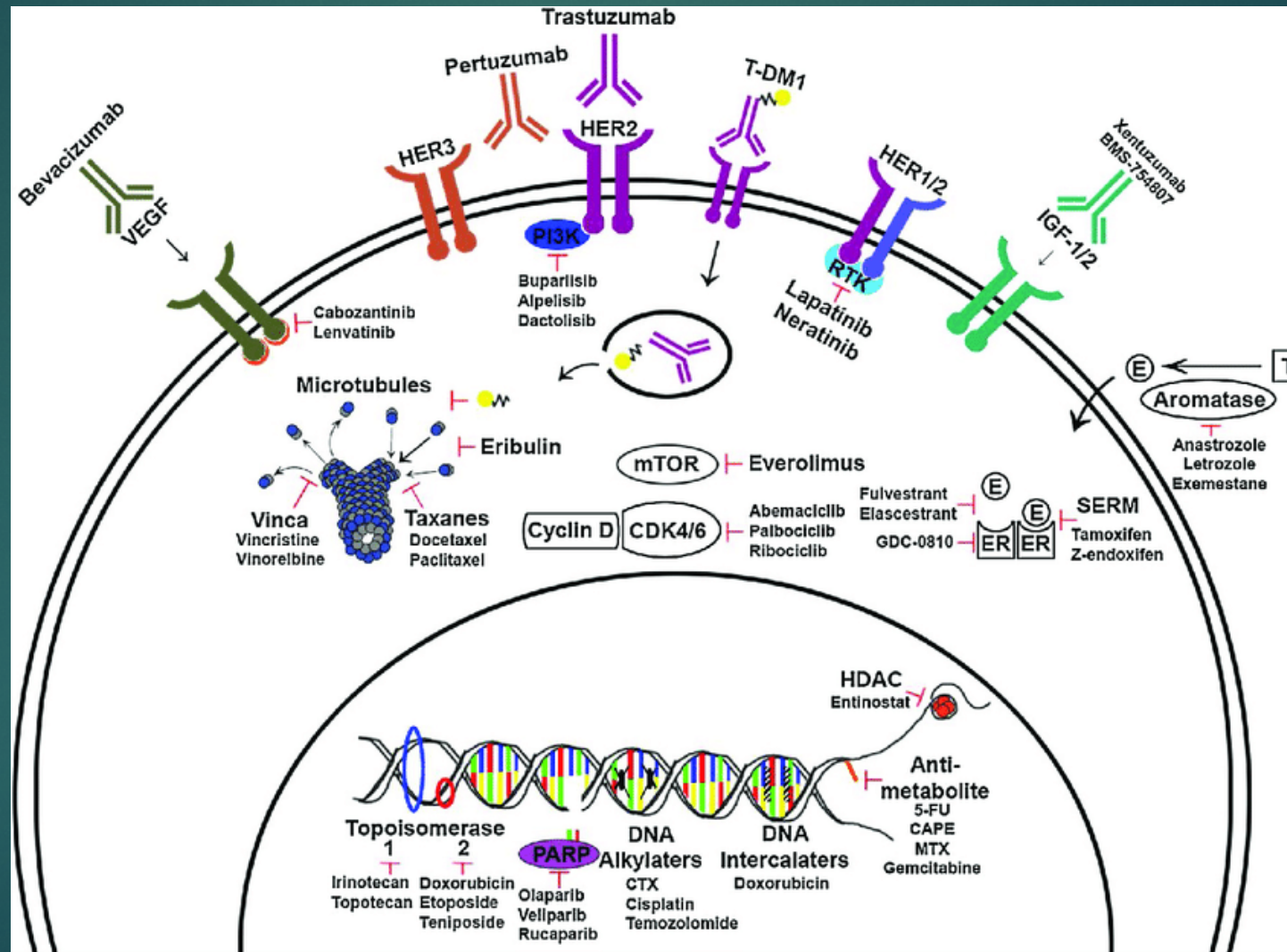
Chemotherapy

- ▶ Drugs that inhibit proliferation of cancer cells
- ▶ In a perfect world, they would only target cancer cells
- ▶ Chemotherapy can have numerous side effects
 - ▶ Dependent on age of patient, dose, and type of drug
- ▶ Two main areas of chemotherapy
 - ▶ Conventional: damage DNA and/or kill dividing cells
 - ▶ Biologic/targeted: target pathways specific to cancer cells

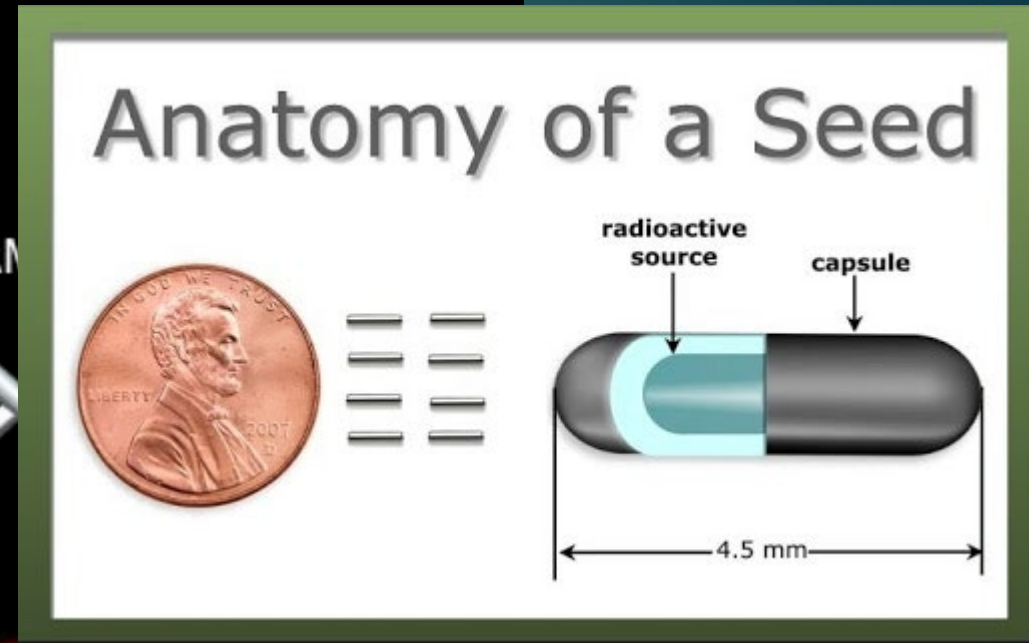
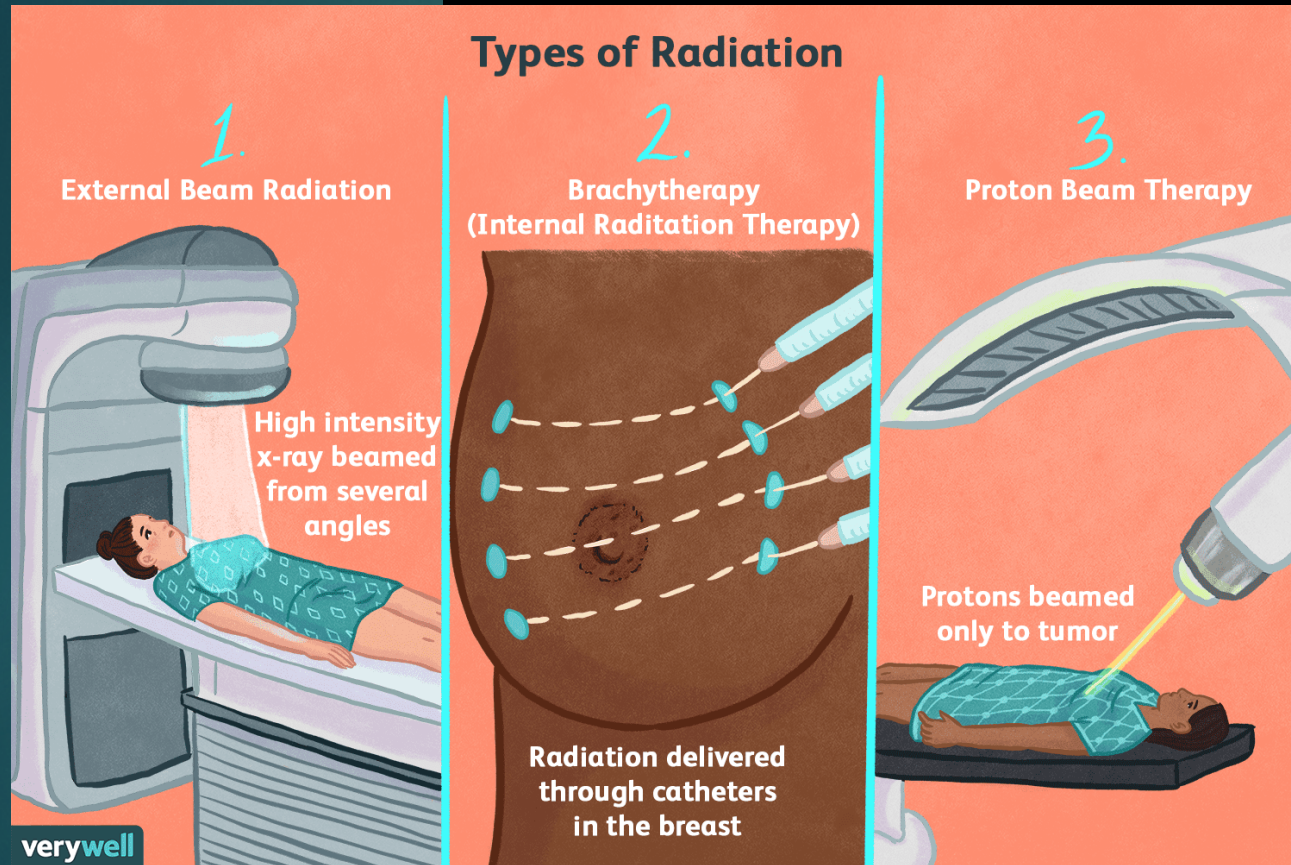
<https://www.healthline.com/health/cancer/effects-on-body#1>



Chemotherapy Examples



Radiation

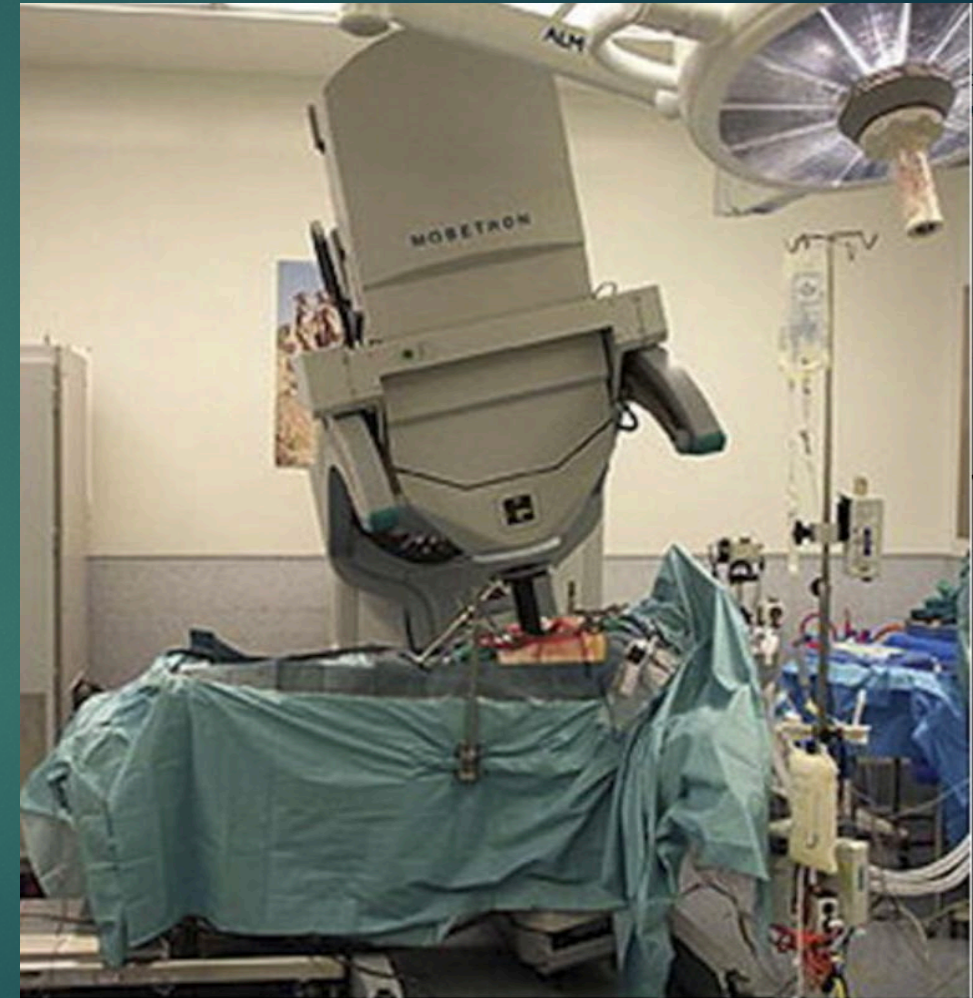


Direct Route

Radiation—Special Techniques



<https://www.med.unc.edu/neurosurgery/services/brain-tumors/cyberknife-and-tomotherapy/>



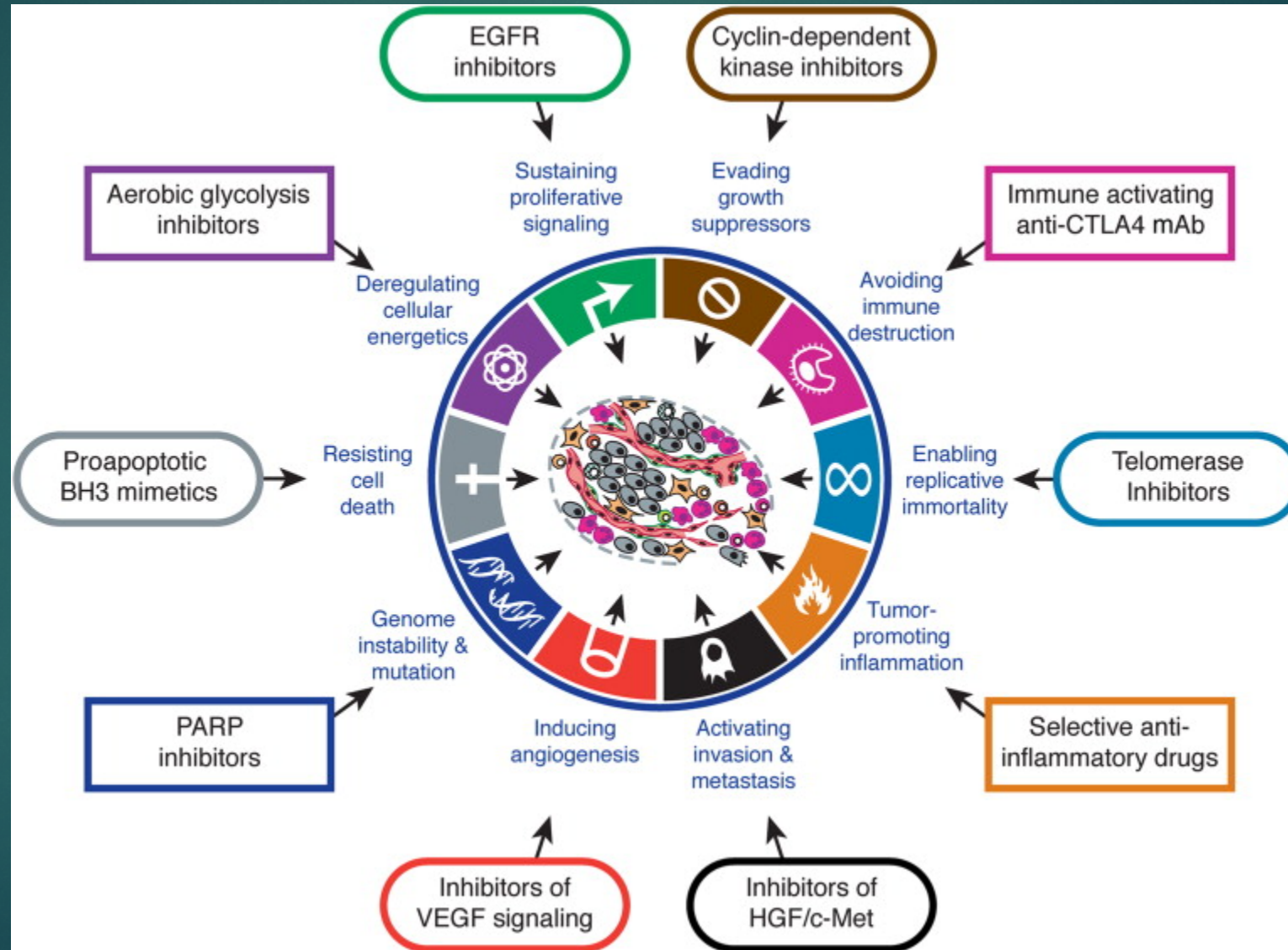
<https://www.med.unc.edu/radonc/patient/treatments/>

Comprehensive Cancer Care

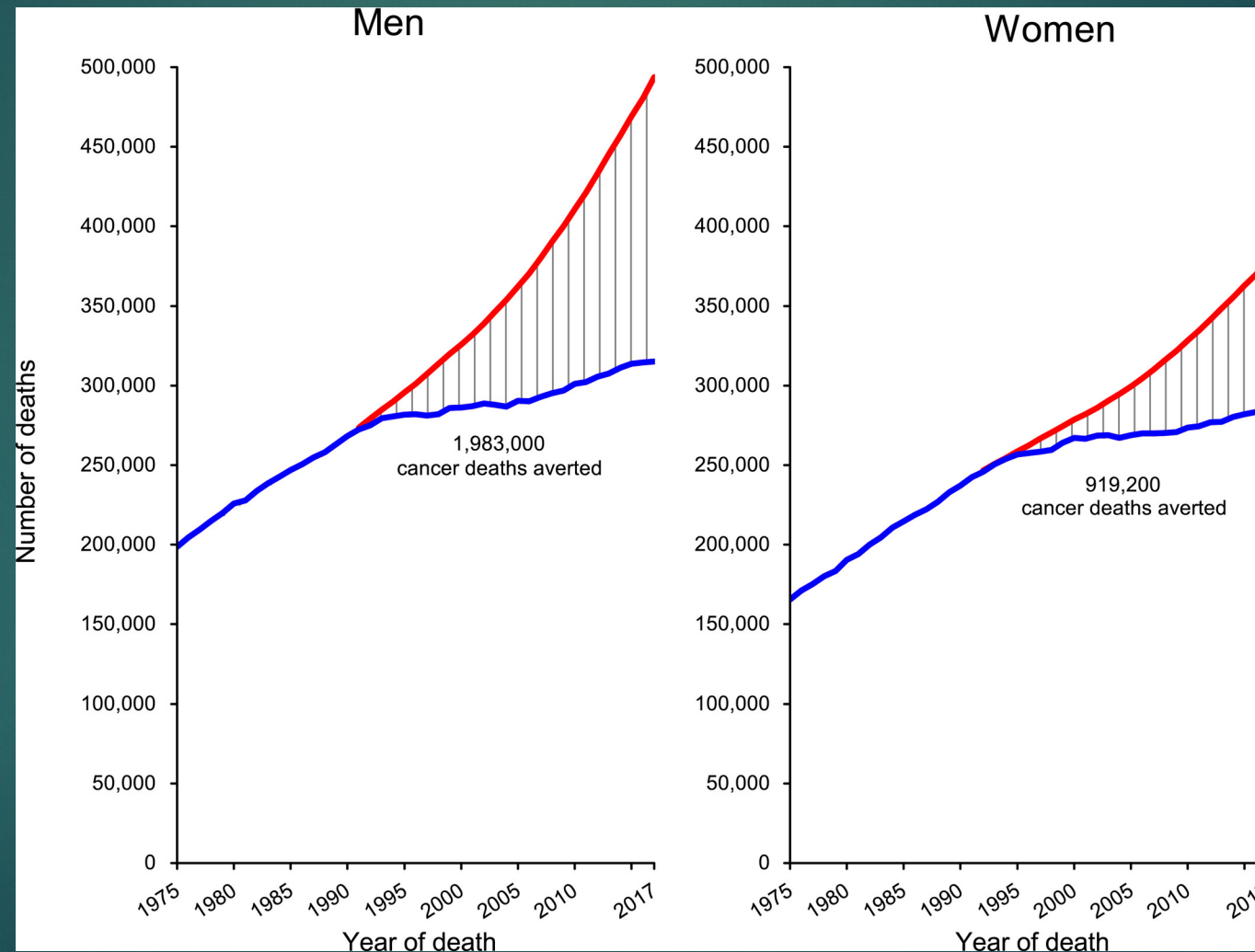


- ▶ Team-based approach
 - ▶ Oncologists
 - ▶ Surgeons
 - ▶ Nutritionists
 - ▶ Psychiatrists
 - ▶ Physical Therapists
 - ▶ Faith/Family Support

Cancer Treatment



Cancer deaths averted since 1991



Questions?