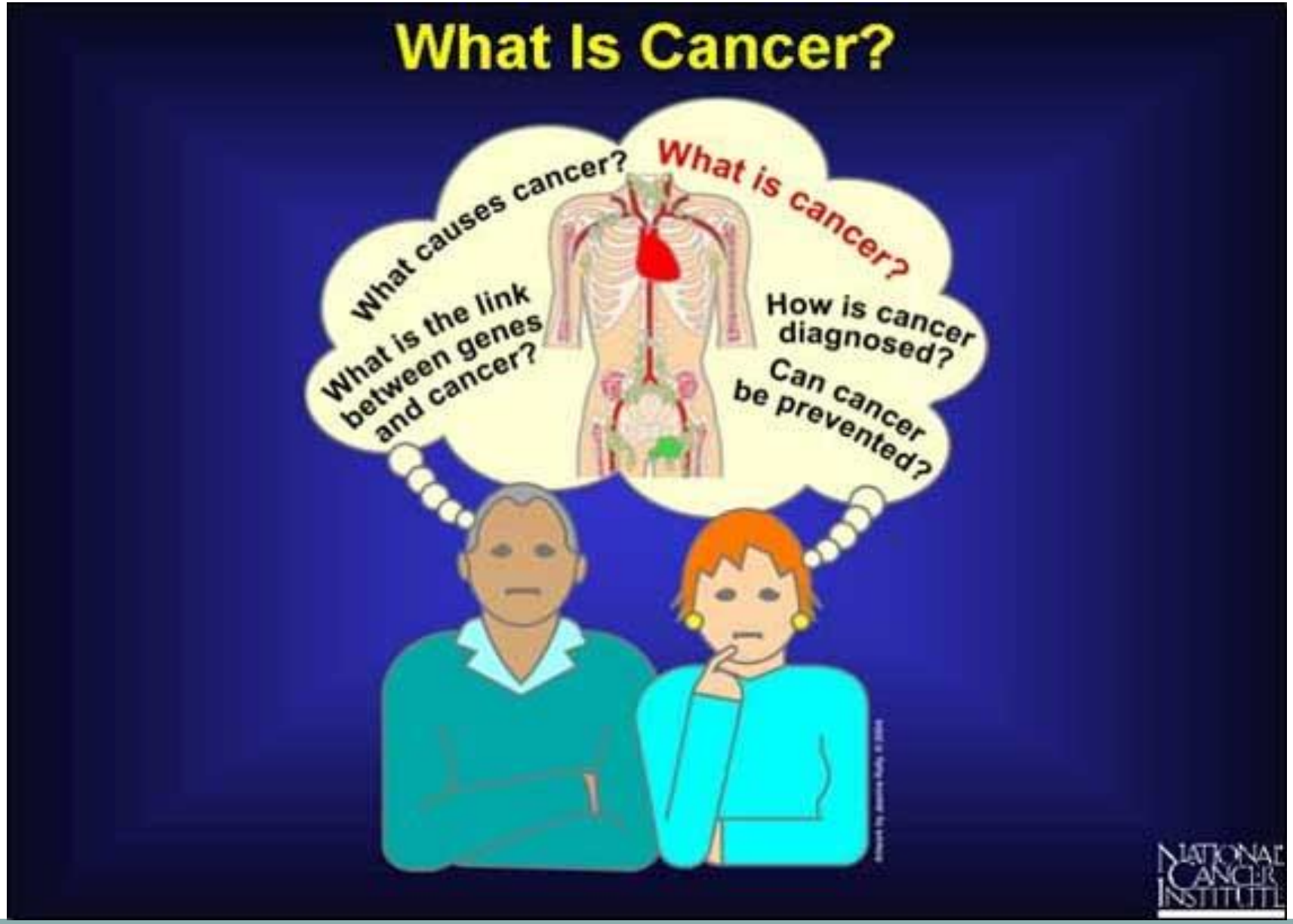
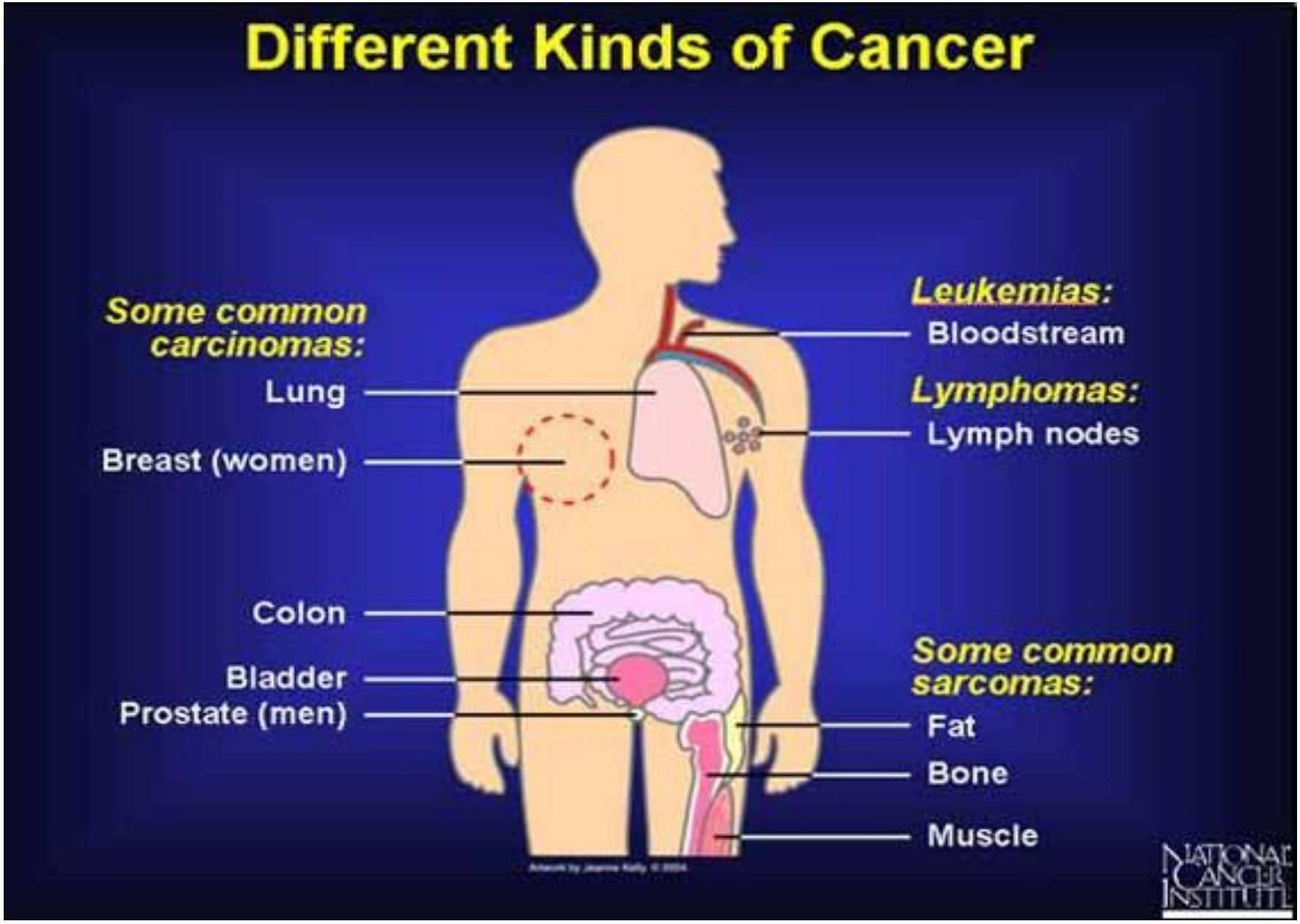
Cancer – Part 1




Different Kinds of Cancer
Some common carcinomas:
Lung
Breast (women)
Colon
Bladder
Prostate (men)
Leukemias:
Bloodstream
Lymphomas:
Lymph nodes
Some common sarcomas:
Fat
Bone
Muscle
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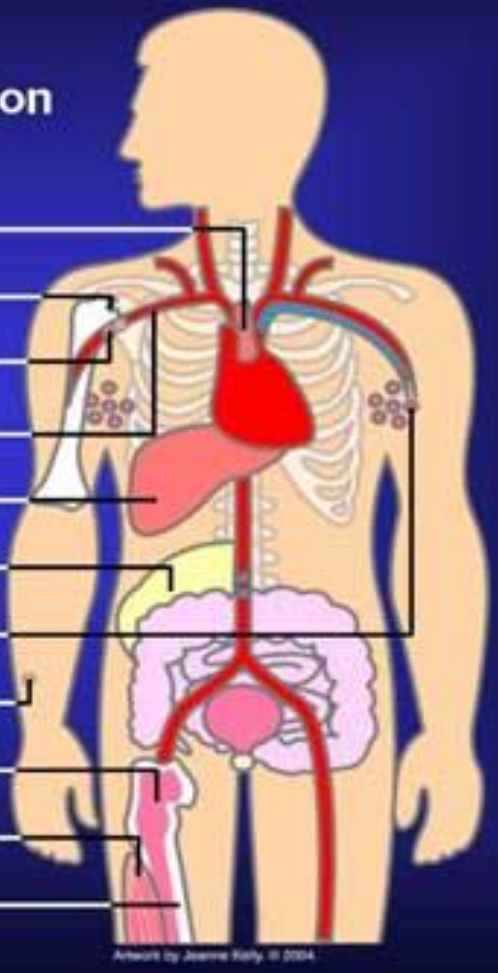
Naming Cancers

Cancer Prefixes Point to Location

Prefix	*Meaning*
adeno-	gland
chondro-	cartilage
erythro-	red blood cell
hemangio-	blood vessels
hepato-	liver
lipo-	fat
lympho-	lymphocyte
melano-	pigment cell
myelo-	bone marrow
myo-	muscle
osteo-	bone



Artwork by Jeanne Kelly. © 2004

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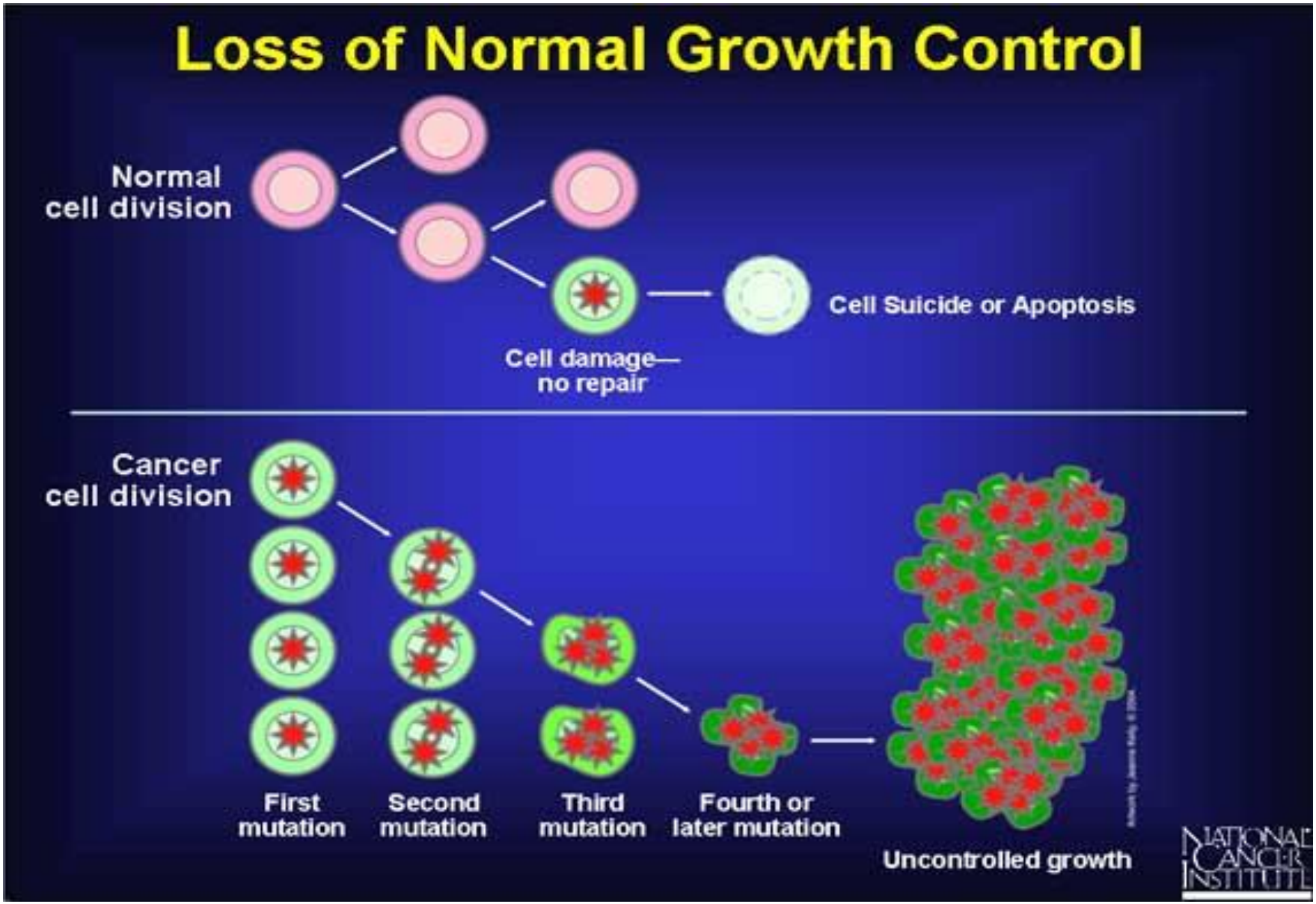
Loss of Normal Growth Control
Normal cell division
Cell Suicide or Apoptosis
Cell damage—no repair
Cancer cell division
First mutation
Second mutation
Third mutation
Fourth or later mutation
Uncontrolled growth
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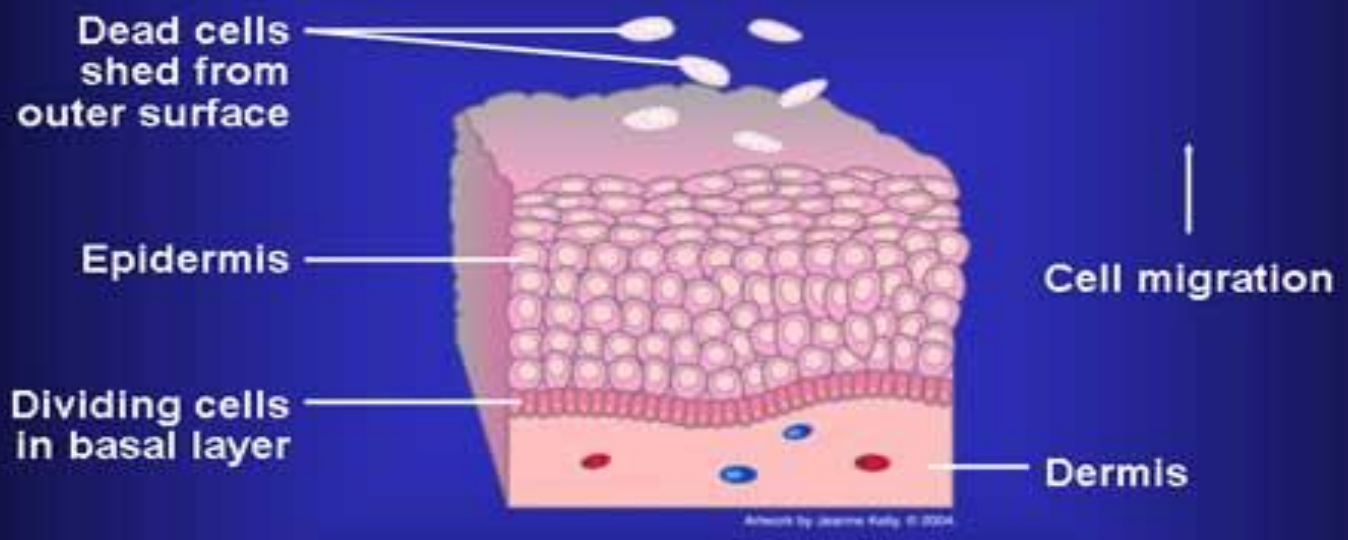
Example of Normal Growth



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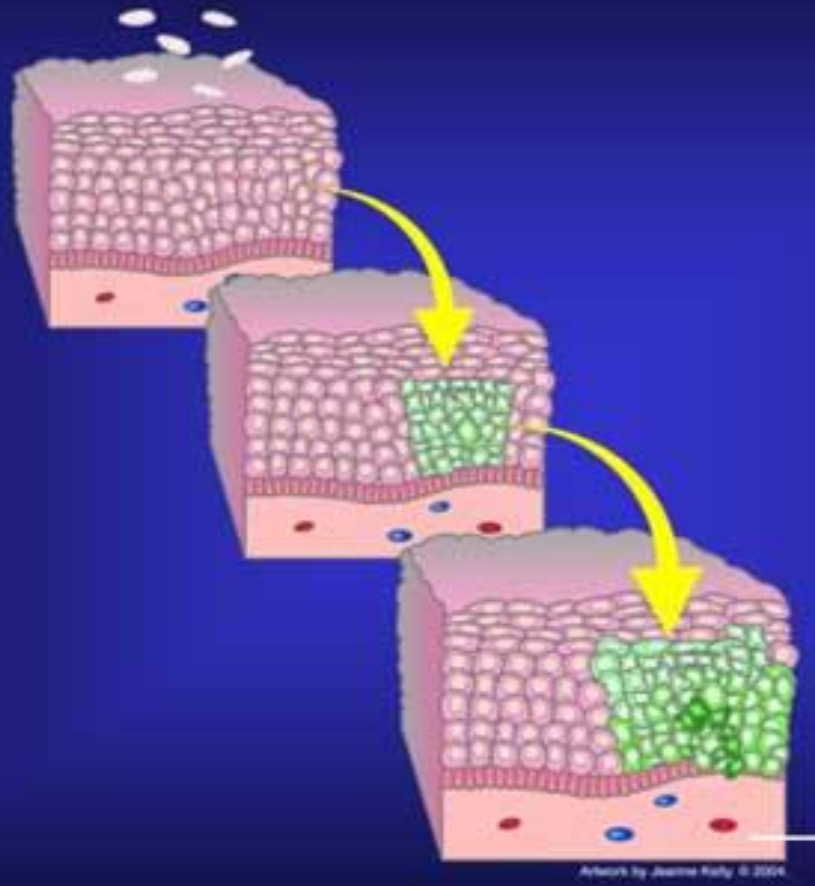
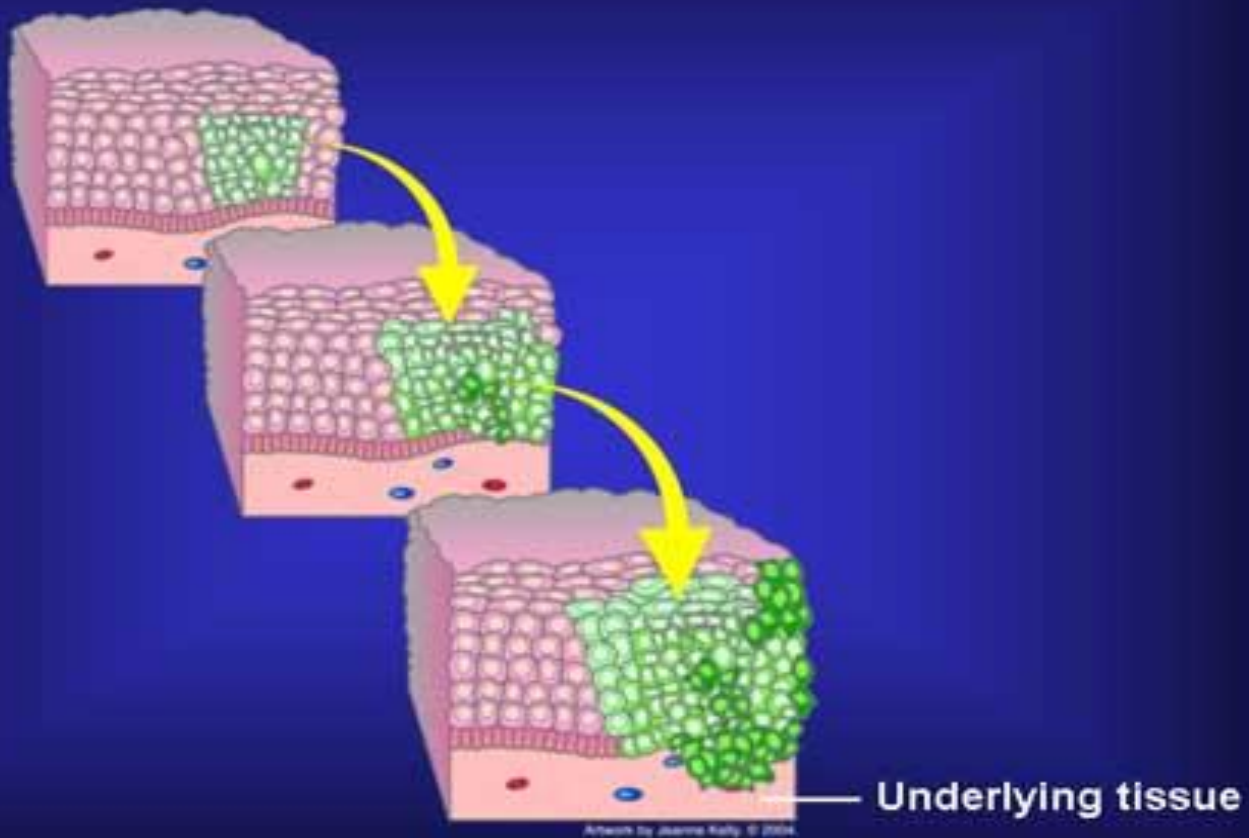
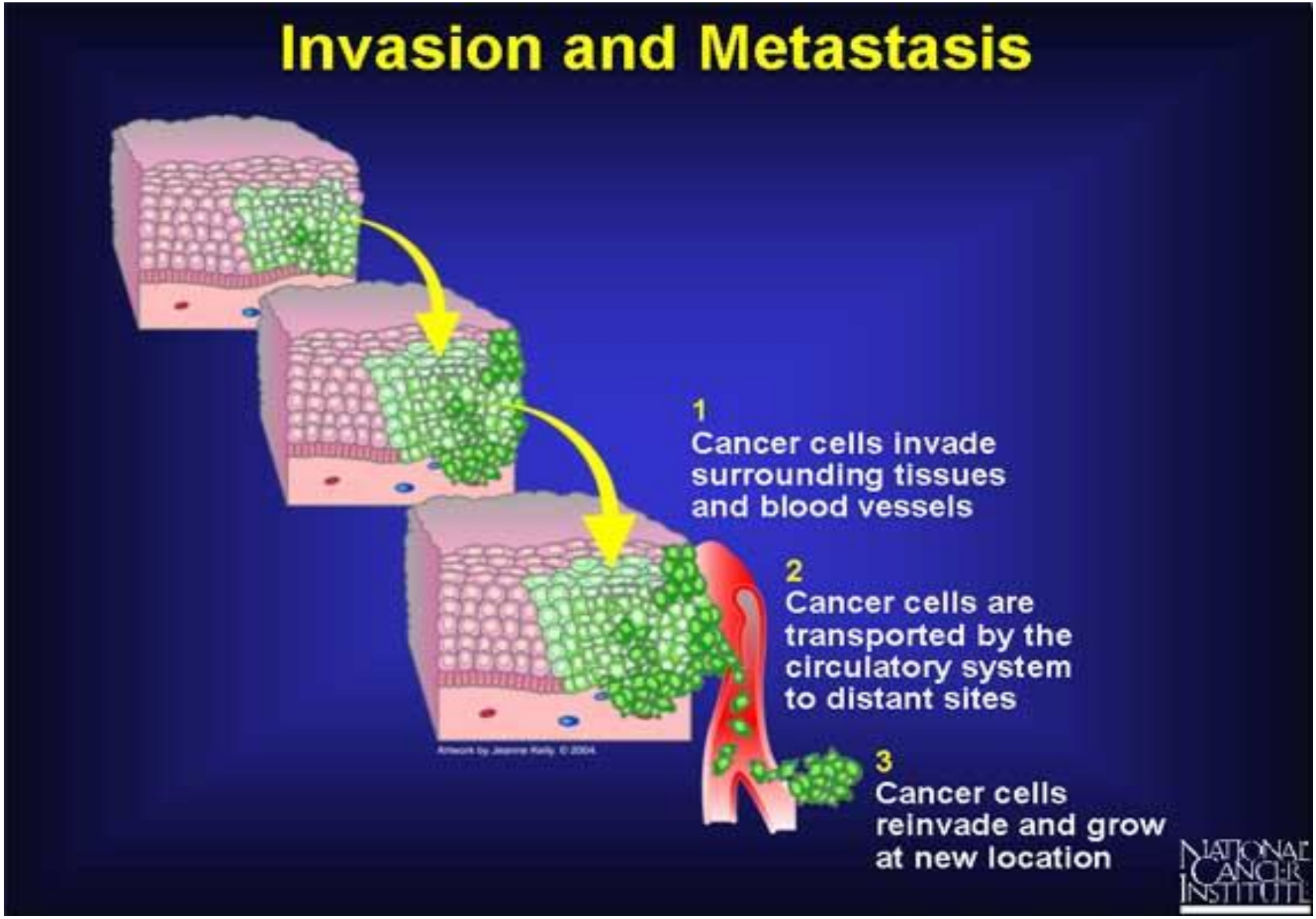
The Beginning of Cancerous Growth



Tumors (Neoplasms)




Invasion and Metastasis
1
Cancer cells invade surrounding tissues and blood vessels
2
Cancer cells are transported by the circulatory system to distant sites
3
Cancer cells reinvade and grow at new location
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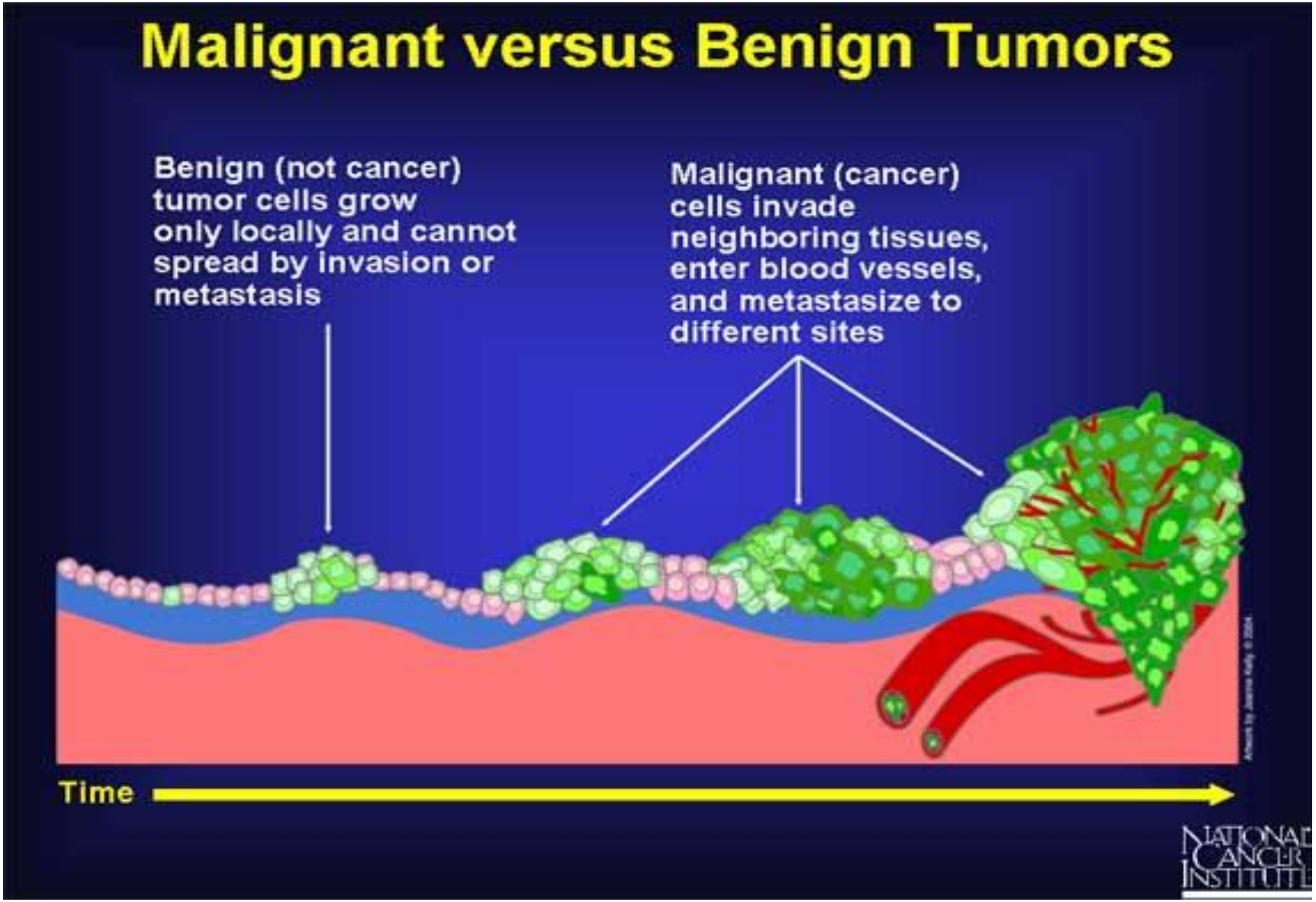
Malignant versus Benign Tumors
Benign (not cancer) tumor cells grow only locally and cannot spread by invasion or metastasis
Malignant (cancer) cells invade neighboring tissues, enter blood vessels, and metastasize to different sites
Time
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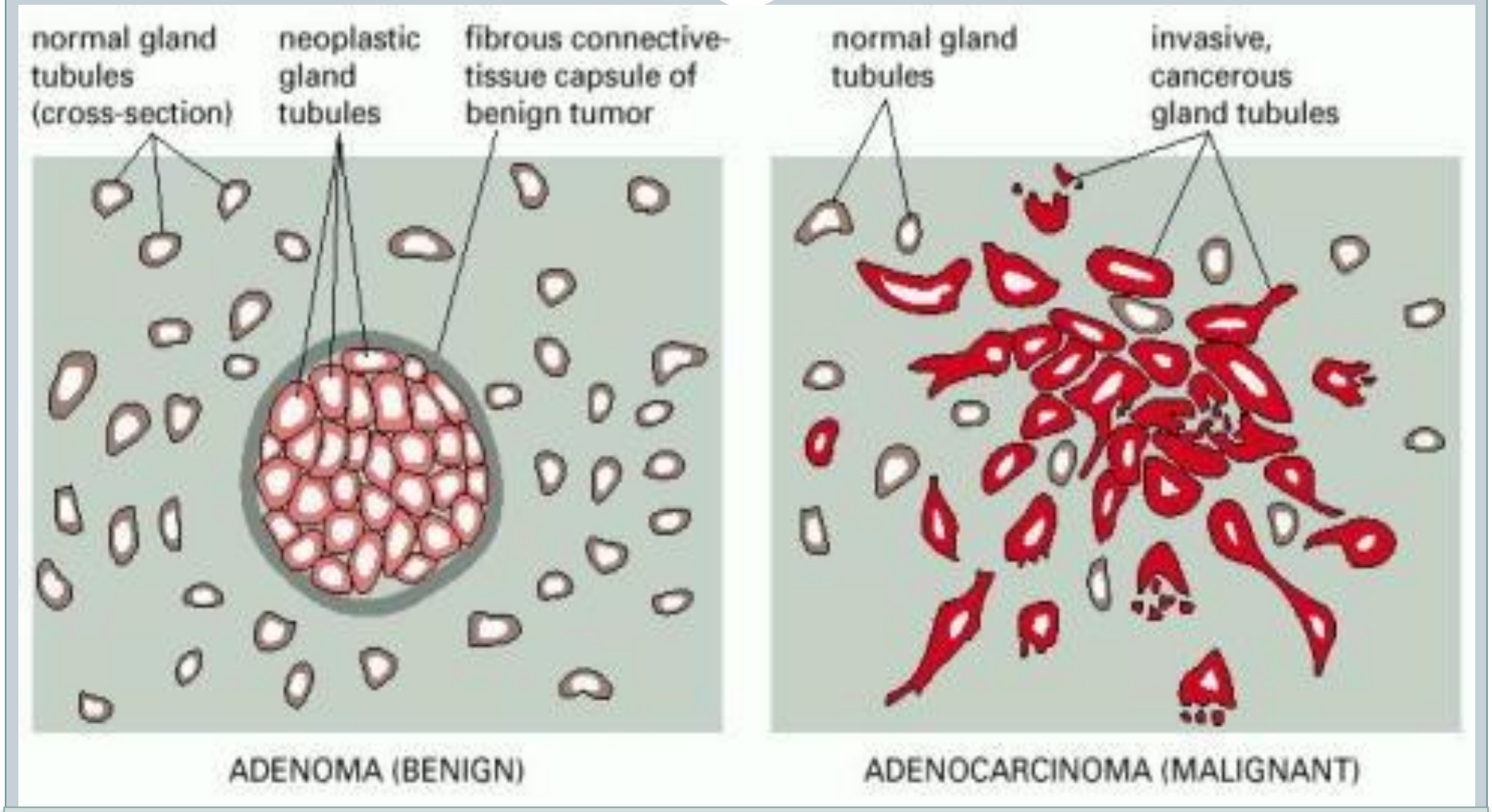
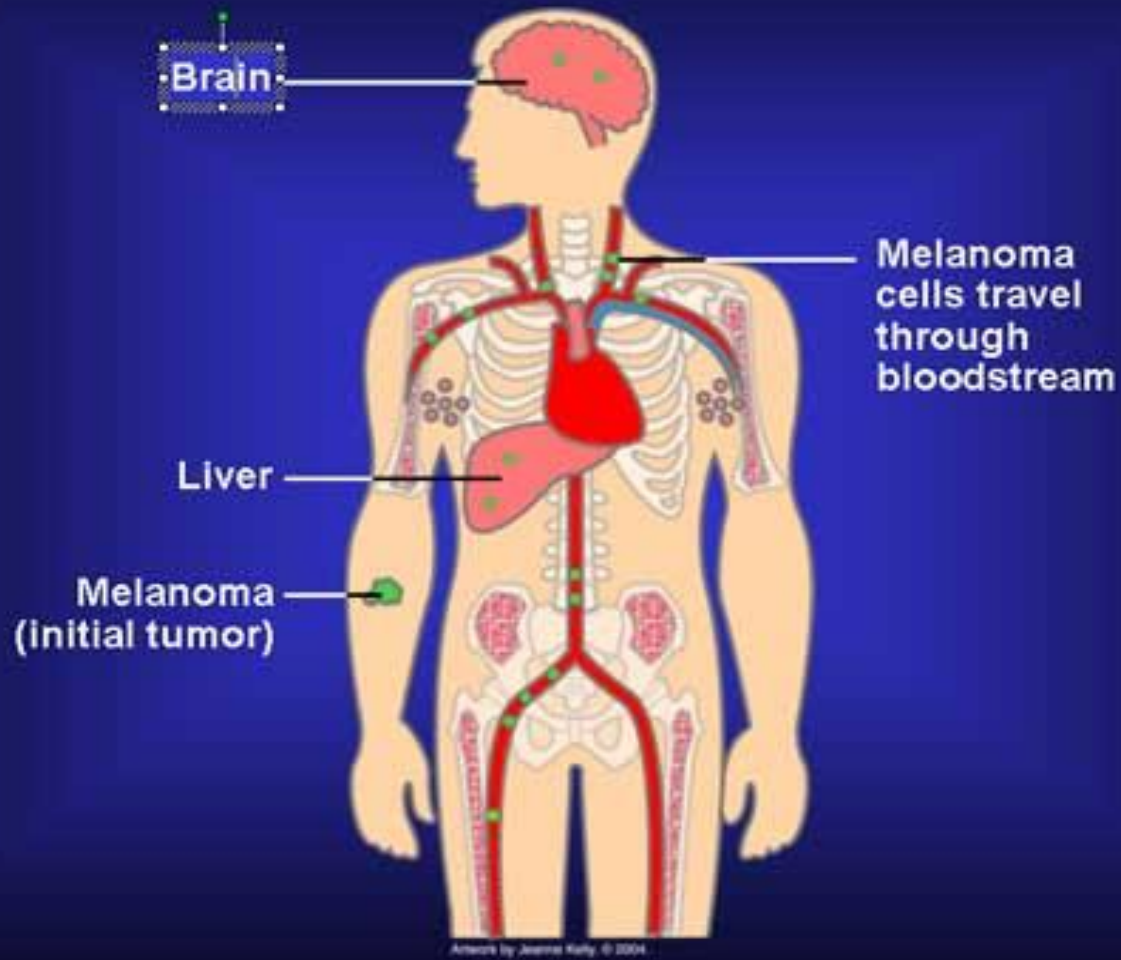
Tumor Types



www.ncbi.nlm.nih.gov/books

Why Cancer Is Potentially Dangerous



Tumor Growth & Metastasis - Lecture & Animations

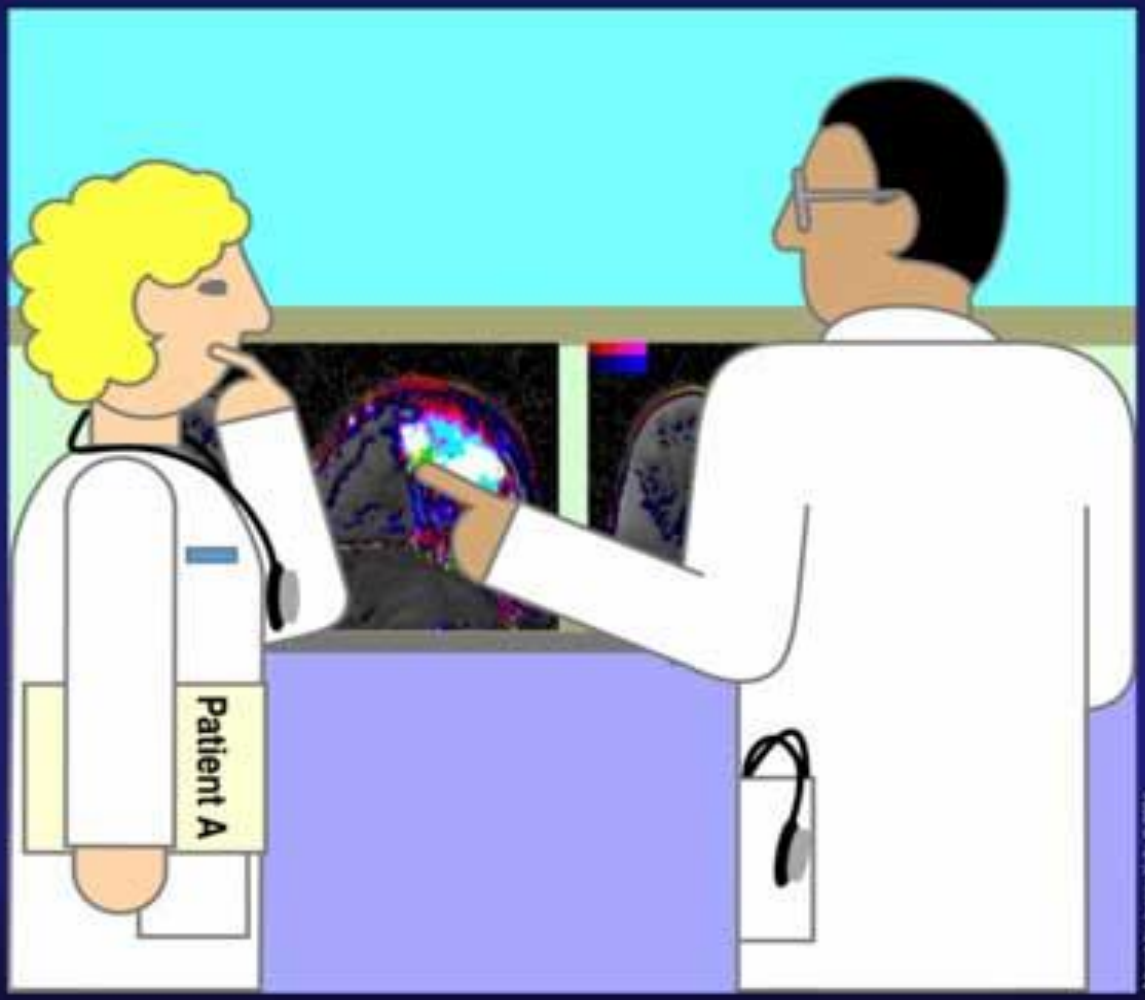
Go to http://www.hhmi.org/biointeractive/ , then at the top of the screen under the **Topic** tab, choose cancer with the drop down menu at the top, and then scroll down to:

Research Mechanics: Putting the Brakes on Cancer, Lecture.

In the first part (segments 1 – 13) – The nature of cancer is explained. Examples of various benign, malignant, and metastatic tumors are shown. An animation of angiogenesis shows tumor cells multiplying, recruiting blood vessels, and metastasizing. (22 minutes, 25 seconds)

In the second part (segments 18-31), cancer is defined as a genetic disease. The three types of genes that mutate to cause cancer – oncogenes, tumor suppressor genes, and repair genes. One example of cancer is familial colon cancer and there are two main kinds – FAP (polyposis) caused by a tumor suppressor gene mutation and HNPCC (non-polyposis) caused by a mismatch repair gene mutation. Also shown is the p53 tumor suppressor protein mutation which occurs in many types of cancer and environmental factors that may cause this mutation. (25 minutes)

Cancer Detection and Diagnosis



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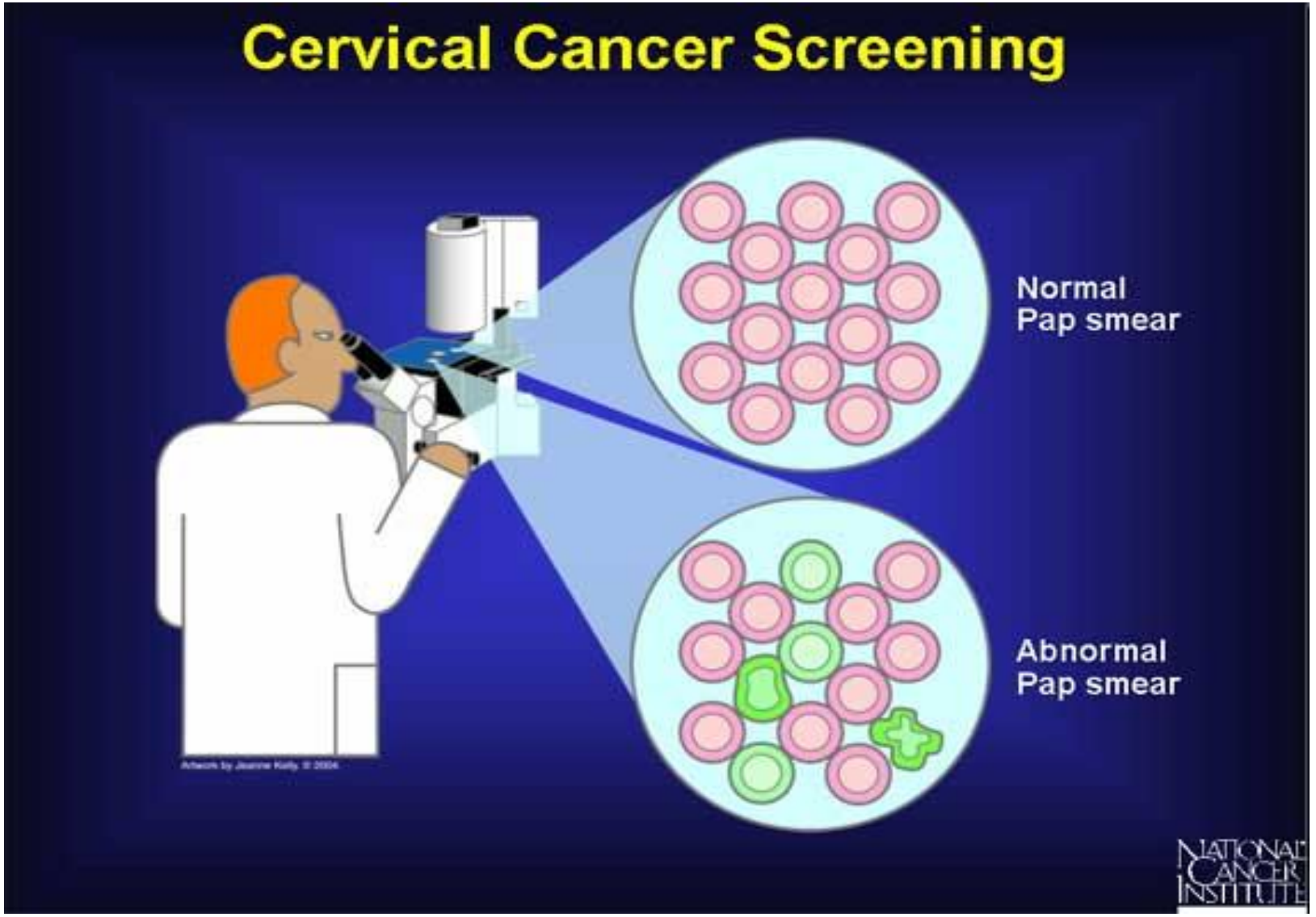
Early Cancer May Not Have Any Symptoms


Cervical Cancer Screening
Normal
Pap smear
Abnormal
Pap smear
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Breast Cancer Screening
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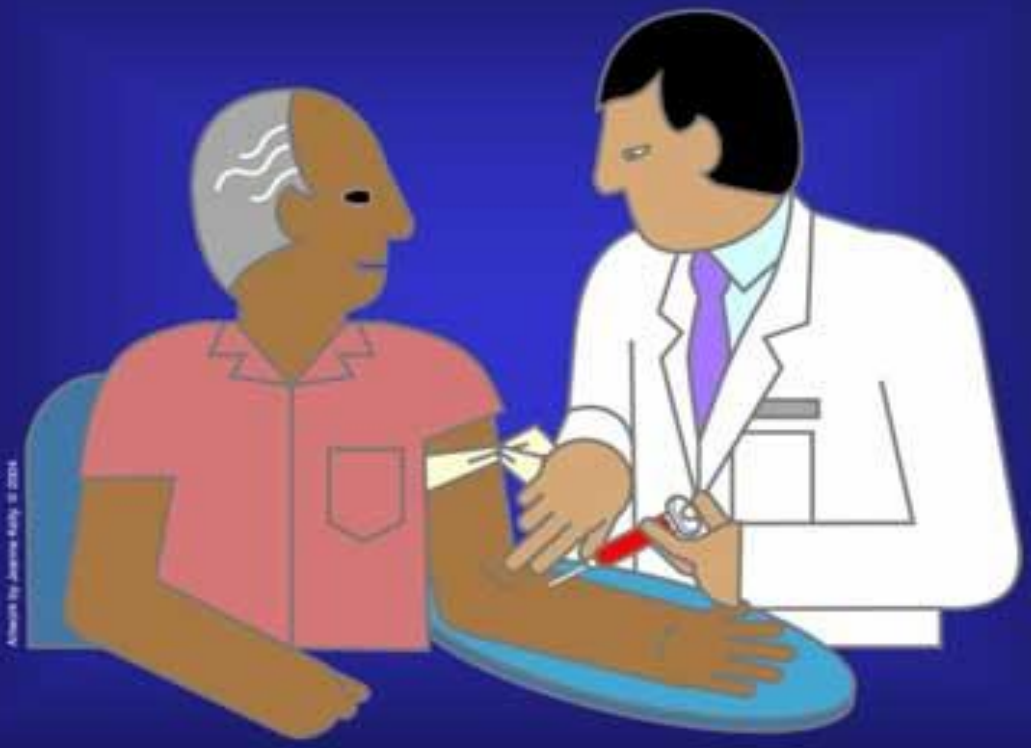
Prostate and Ovarian Cancer Screening



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Colon Cancer Screening

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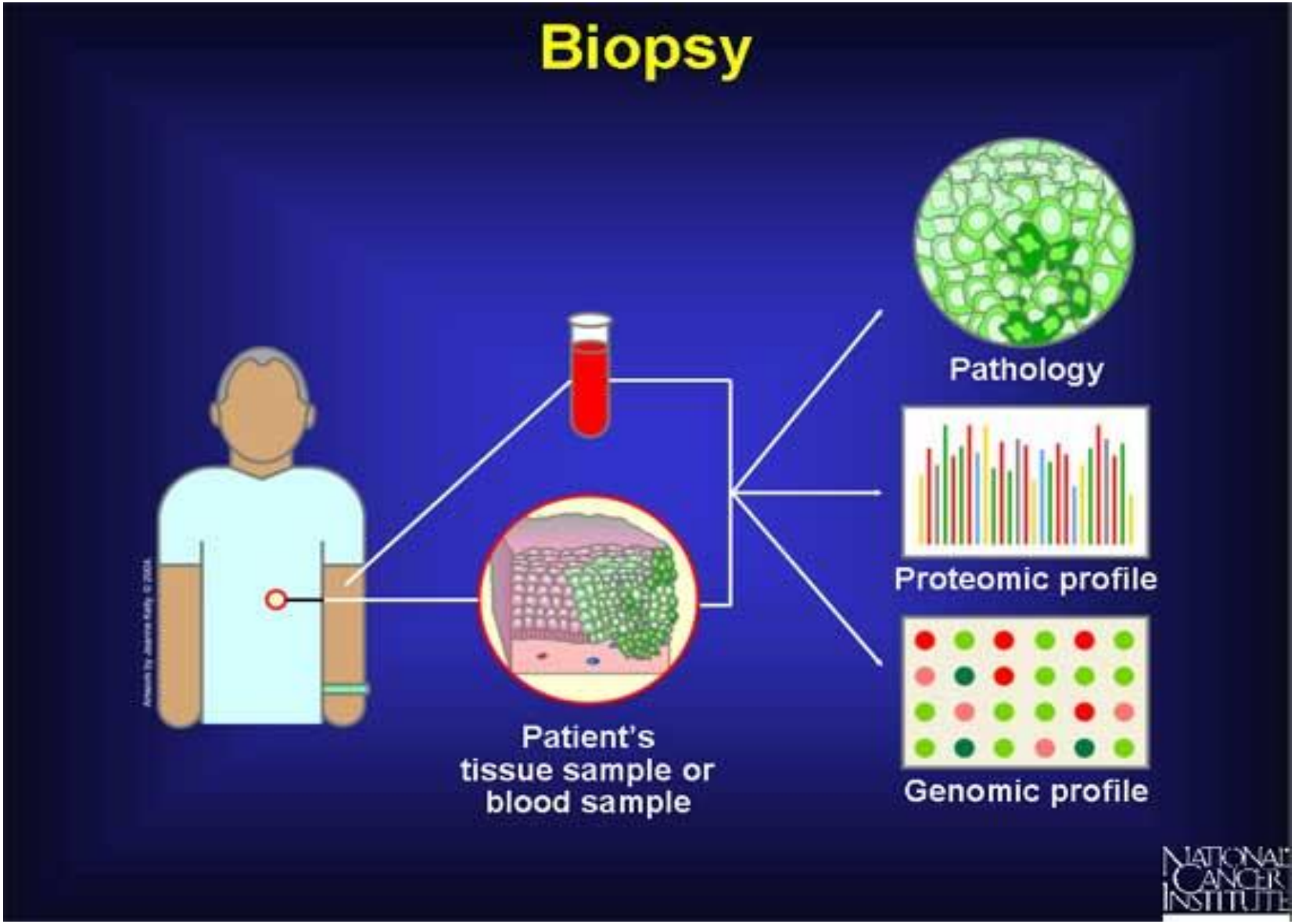
Early Screening for Colon Cancer – Lecture & Video

Go to http://www.hhmi.org/biointeractive/ , then at the top of the screen under the **Topic** tab, choose cancer with the drop down menu at the top, and scroll down to:

Chaos to Cure: Bringing Basic Research to Patients, Lecture.

The first part (segments 1 -13) is about colon cancer caused by a mutation of the APC gene leading to Familial Adenomatous Polyposis (FAP) Early screening saves lives. (22 minutes, 20 seconds).


Biopsy
Pathology
Proteomic profile
Genomic profile
Patient's
tissue sample or
blood sample
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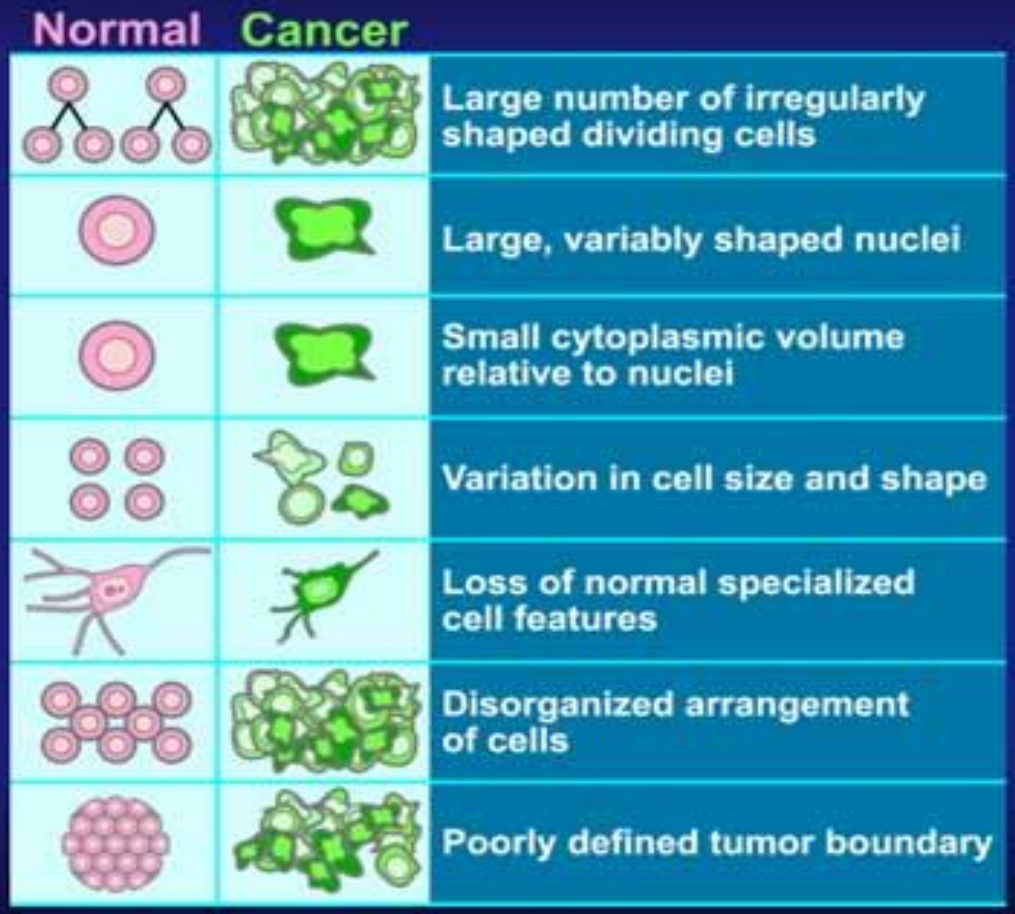
Microscopic Appearance of Cancer Cells



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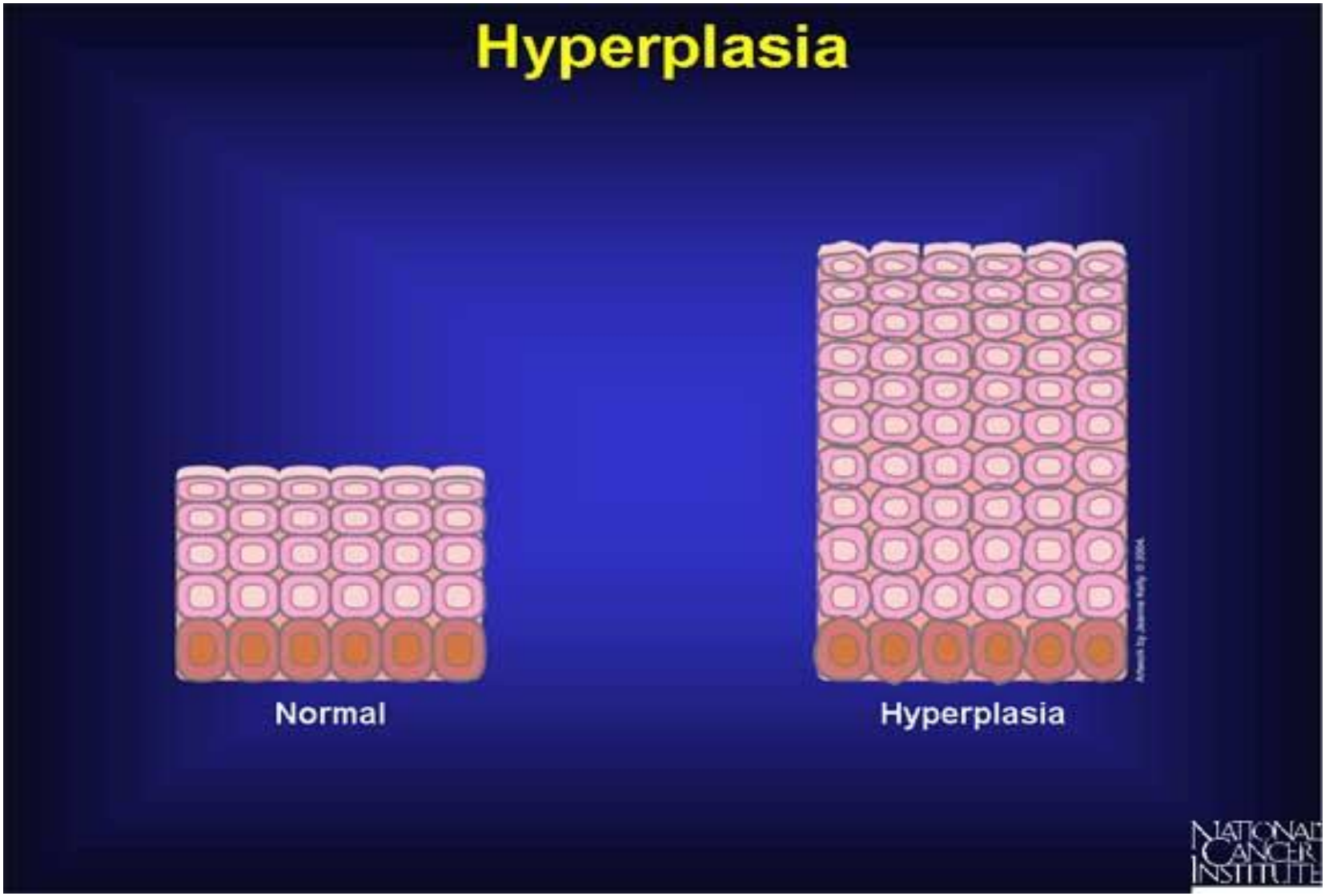
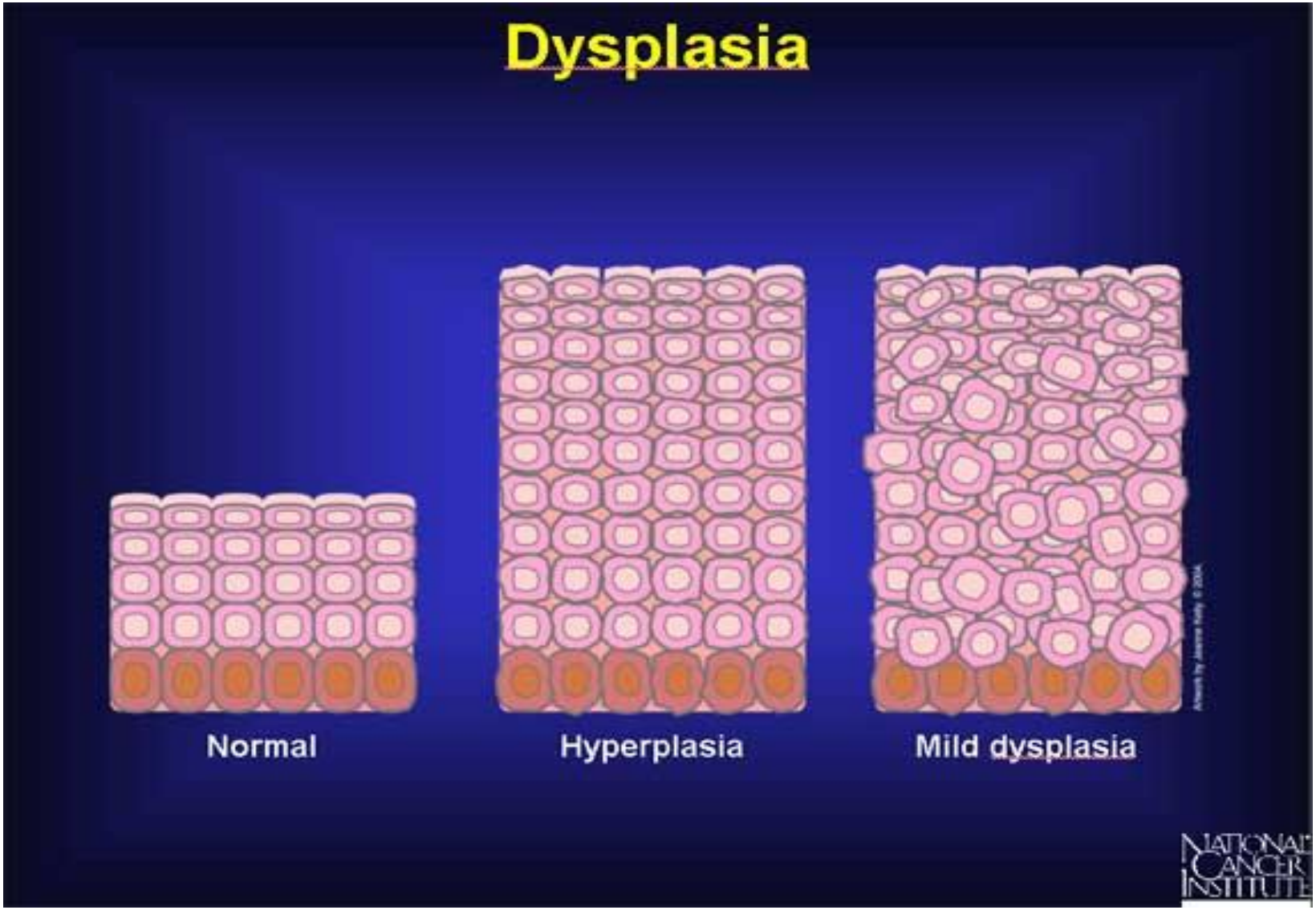

Hyperplasia
Normal
Hyperplasia
NATIONAL CANCER INSTITUTE


Dysplasia
Normal
Hyperplasia
Mild dysplasia
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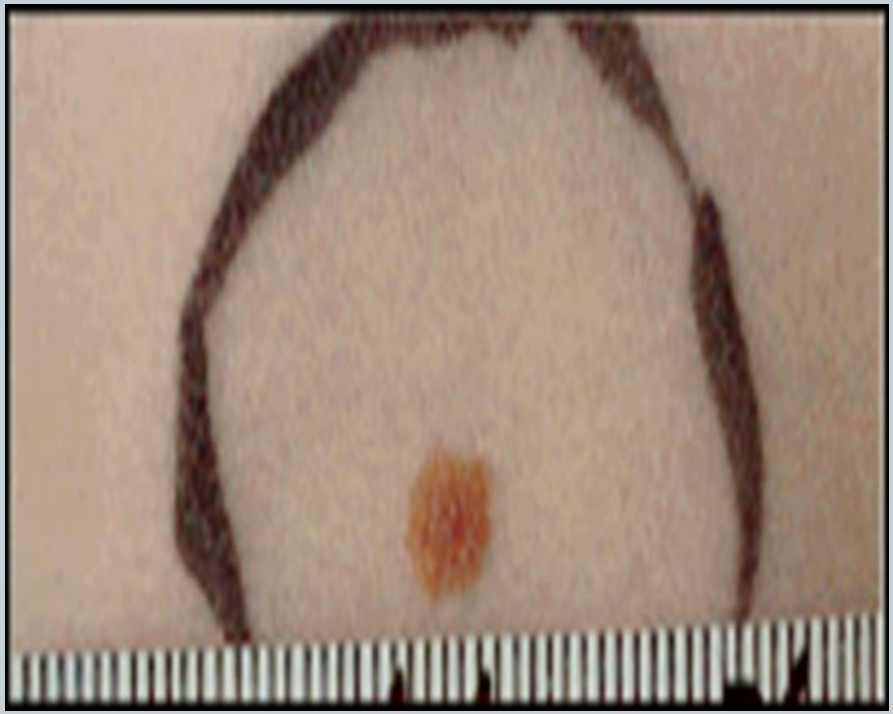
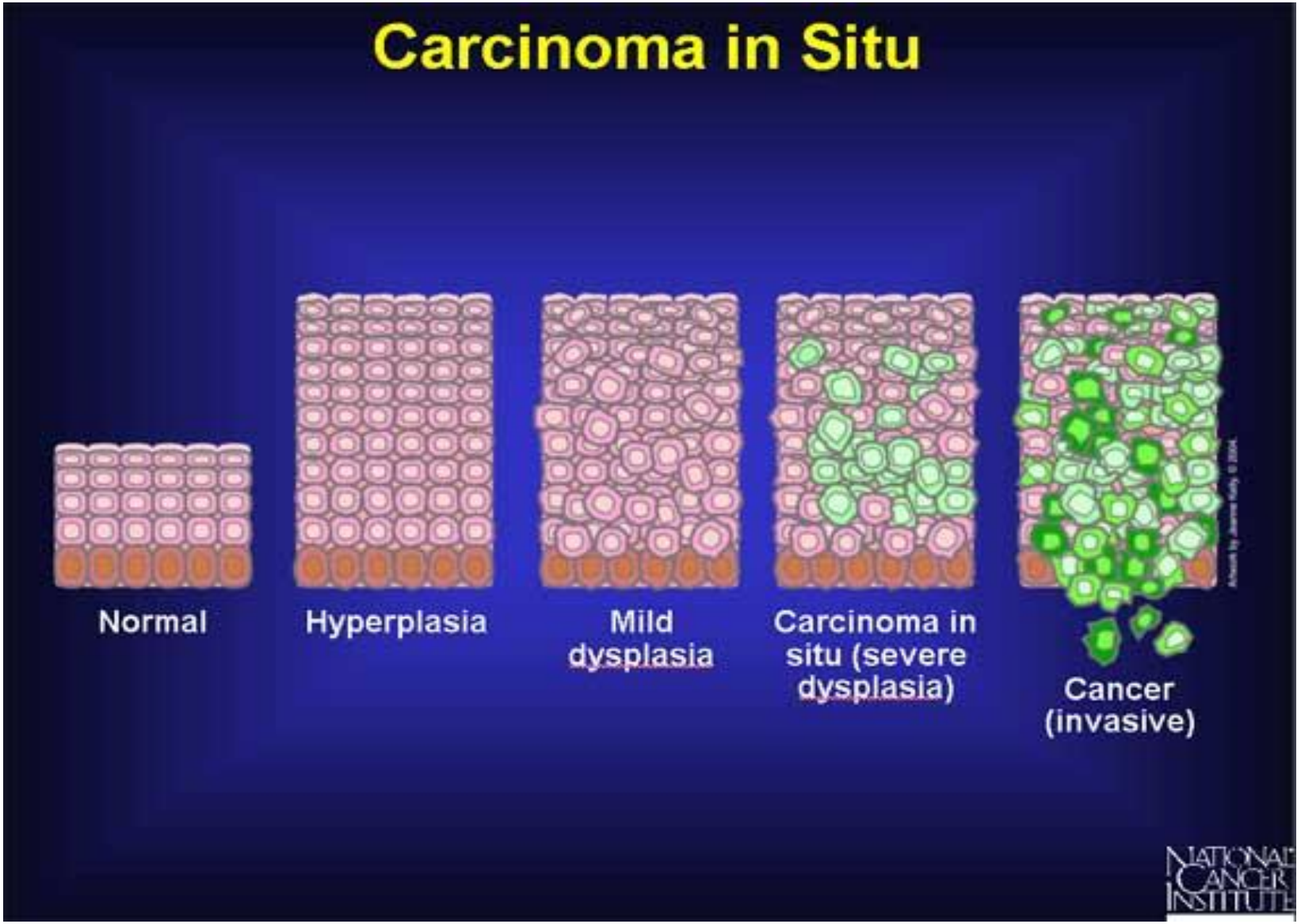
Normal Common Mole with Distinct Edges (Left) and Dysplastic Nevus (Right) with Irregular Edges and Color Fading into the Skin Around It



http://www.cancer.gov/cancertopics/prevention/skin/molephotos


Carcinoma in Situ
Normal
Hyperplasia
Mild dysplasia
Carcinoma in situ (severe dysplasia)
Cancer (invasive)
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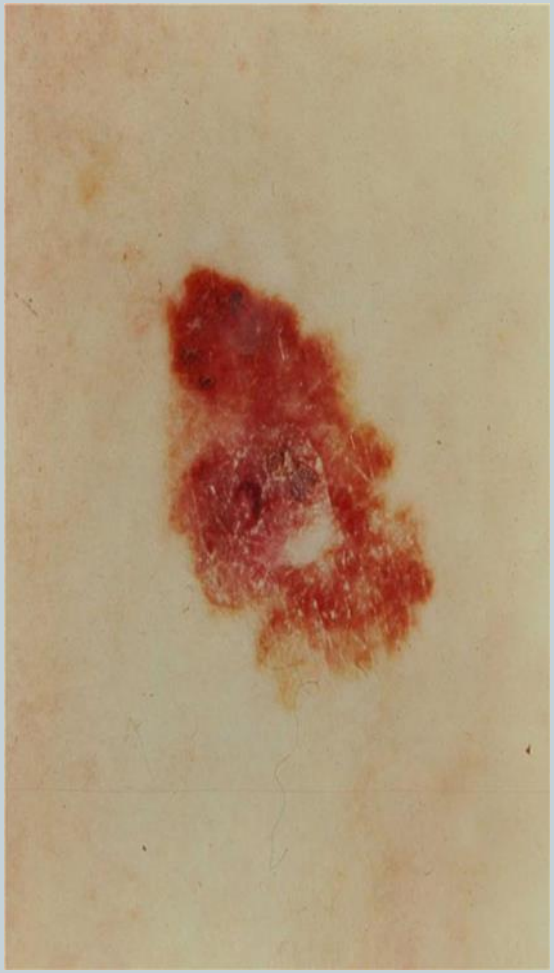
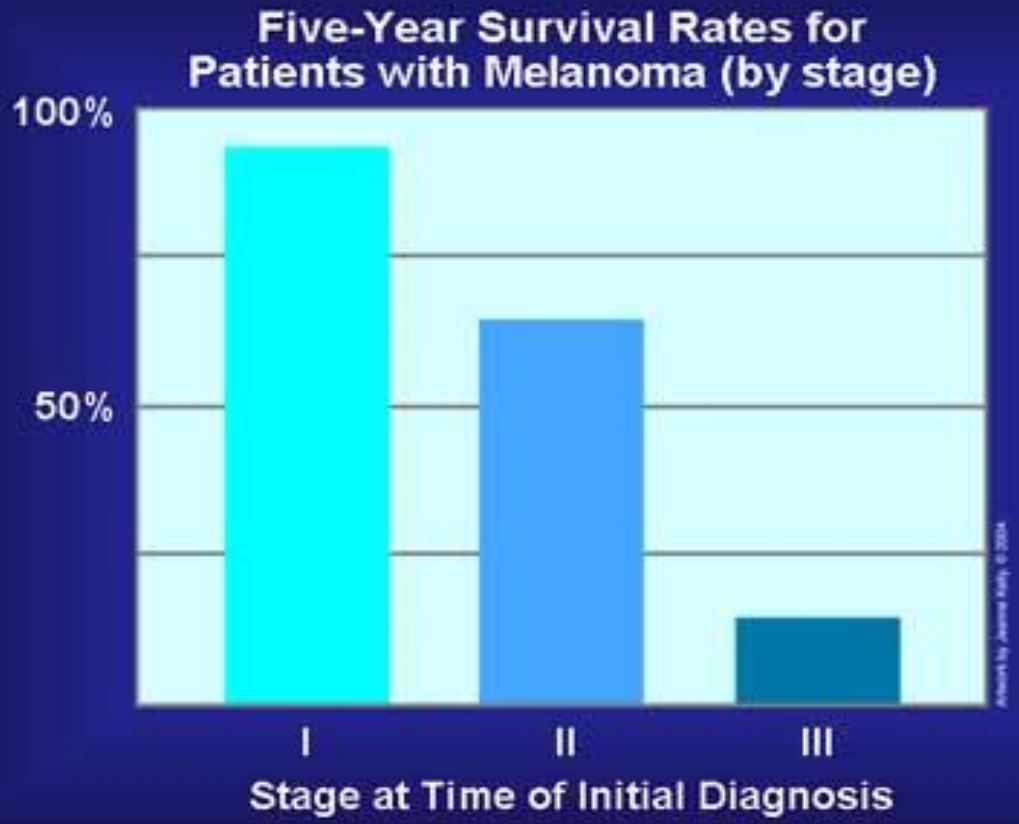
Melanoma (Cancer) Lesions



http://www.cancer.gov/cancertopics/pdq/treatment/melanoma/HealthProfessional

Tumor Staging



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Tumor Grading