



Cancer Screenings: Promote, Act, and Educate

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Disclosures

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Disclosures

References to Off-label or investigational usage(s) of pharmaceuticals or instruments:

- None



Objectives

- Review U.S. and world rates of breast, cervical, and colon cancer
- Outline the United States Preventative Task Force (USPTF) and American Cancer Society recommendations for breast, cervical, and colon cancer screening
- Explain epidemiology, etiology, prevention, and patient education regarding breast, cervical, and colon cancer
- Hypothesize possible interventions to improve patient education and cancer screening rates in the U.S.

Cancer Screenings



BREAST



COLON



CERVICAL

Review

Epidemiology

Risk Factors

Etiology

Signs & Symptoms

Diagnosis

Treatment

Prevention





Breast Masses - Etiology

Benign

- Fibroadenoma
- Cyst
- Fibrocystic changes
- Galactocele
- Fat Necrosis
- Breast Abscess

Malignant

- Invasive
- Non-invasive




Breast Cancer - Epidemiology

- Most Common
- Highest:
 - North America
 - Australia/New Zealand
 - Western/Northern Europe
- Lowest:
 - Asia
 - Sub-Saharan Africa



Breast Cancer – Risk Factors

- Increasing age
- Female Sex
- Race/Ethnicity
- Obesity
- Tall Stature
- Benign Breast Disease
- Dense Breast Tissue
- Bone Mineral Density
- Hormonal Factors
- Reproductive Factors
 - Early Menarche
 - Later Menopause
 - Nulliparity
 - First Full-term pregnancy
- Personal history of breast cancer
- Family history of breast cancer
- Alcohol Consumption
- Smoking
- Exposure to Ionizing Radiation



Breast Cancer – Breast Density

- BI-RADS

- A

- Fatty

- B

- Scattered Fibroglandular

- C

- Heterogeneously Dense

- D

- Extremely Dense

- 50% have dense breast tissue



Breast Cancer - Screening

- Asymptomatic
 - Annual Mammography
 - 40-49 years
 - >50 years
- Discontinuation
 - Age > 75
 - Expected life span is <10 years



Breast Cancer Screening: Risk versus Benefit

- Benefits:

- Reduction in breast cancer deaths

- Harm

- Overdiagnosis
- False-negative results
- False-positive results



Breast Cancer – Options

- Mammography
 - Digital Breast Tomosynthesis
- MRI
 - BRCA Variant Carrier
 - Other Variants
 - 1st degree relative of a BRCA variant carrier
 - Lifetime risk of >20%
 - Radiation to Chest
- Supplemental Screening
 - Digital breast tomosynthesis
 - MRI
 - Contrast-enhanced digital mammography (CEDM)
 - Molecular breast imaging (MBI)

- Low Income
- Uninsured
- Underinsured
 - National Breast and Cervical Cancer Early Detection Program (NBCCEDP)
- Foreign-born women

Breast Cancer - Resources



Breast Cancer – Signs & Symptoms

- Abnormal Mammogram
 - None
- Breast Mass
- Axillary Mass
- Skin Changes
- Back Pain
- Leg Pain
- Abdominal Pain
- Nausea
- Jaundice
- Shortness of Breath
- Cough



Breast Cancer - Diagnosis



Mammography

Breast Ultrasound



Breast
Cancer -
Diagnosis

Infiltrating Ductal Carcinoma

Infiltrating Lobular Carcinoma

Mixed ductal/lobular carcinoma

Luminal subtypes

HER2-enriched

Basal subtypes



Breast Cancer - Treatment

- Hormone Receptor Status
- TNM staging system



Breast Cancer – Genetic Counseling



Family





Breast Cancer - Prevention

- Breastfeeding
- Physical activity
- Weight loss in postmenopause
- Low-fat diet
- Chemoprevention
- Surgical prevention

Inconclusive:

- Fruits and vegetables
- Fat intake
- Soy/phytoestrogens
- Red Meat
- Fiber intake
- Calcium/vitamin D
- NSAIDs
- Bisphosphonates
- Phthalates
- Infertility
- Night-shift work



Colon Cancer - Etiology

- Anatomic
- Vascular
- Inflammatory
- Neoplastic



Colon Cancer - Epidemiology

- Male > Female
- 3rd most common men
- 2nd most common women
- Geographic:
 - Australia/New Zealand
 - Europe
 - North America

- Age
- Hereditary CRC syndromes
- Personal history
 - CRC
 - Adenomatous polyps
- Family history
 - CRC
 - Adenomatous polyps
- Inflammatory bowel disease
- Radiation
- Cystic Fibrosis
- Race
- Sex
- Acromegaly
- Renal Transplantation
- Obesity
- Diabetes
- Red Meat
- Tobacco
- Alcohol
- Androgen Deprivation Therapy
- Cholecystectomy



Colon Cancer – Risk Factors



Colon Cancer - Screening

- Asymptomatic
 - Age > 45
- Discontinuation
 - Age > 75
 - Expected life span is <10 years
 - Prior testing results



Colon Cancer Screening: Risk versus Benefit

□ Benefits:

- Decreased mortality rates
- Improve prognosis
- Remove premalignant polyps

□ Harm

- Perforation
- Overdiagnosis
- False-negative results
- False-positive results



Colon Cancer – Options

- Colonoscopy
 - Every 10 years
 - Surveillance
- Multitarget stool DNA testing
 - Every 3 years
- Fecal immunochemical testing
 - Annually
- Computed tomography colonography
 - Every 5 years



Colon Cancer – Signs & Symptoms

- Asymptomatic
- Change in bowel habits
- Melena
- Rectal bleeding
- Rectal mass
- Iron deficiency anemia
- Abdominal pain
- Abdominal distention
- Nausea/vomiting



Colon Cancer - Diagnosis

- Colonoscopy
- Computed tomography colonography
- PILLCAM 2
- Biopsy
- Tumor Markers
- Flex Sigmoidoscopy
- Blood based tests:
 - Metyhlated circulating DNA markers
 - Blood-based microRNAs
 - Cell-free DNA



Colon Polyp - Diagnosis

- Inflammatory
- Hamartomatous
- Sessile Serrated Lesions
- Adenomatous Polyps
- Submucosal



Colon Cancer - Treatment

- TNM Staging
- Tumor Markers
- Colonoscopy
- Radiographic imaging
- Family History
- Surgical Resection
- Neoadjuvant therapy
- Radiation Therapy




Colon Cancer – Genetic Counseling



Family





Colon Cancer - Prevention

- Physical Activity
- Diet
- Fiber
- Resistant Starch
- Folic Acid and Folate
- Vitamin B6
- Calcium
- Vitamin D
- Magnesium
- Garlic
- Fish Consumption
- Coffee Intake
- Aspirin/NSAIDs
- Chemoprevention
- Hormone Therapy
- Statins



Cervical Cancer – Etiology



HPV





Cervical Cancer – Epidemiology

- 4th most common cancer
- Resource-limited regions
- Geographical:
 - Africa
 - Central America
- Black > White
- 50 years
- Low vaccination rates



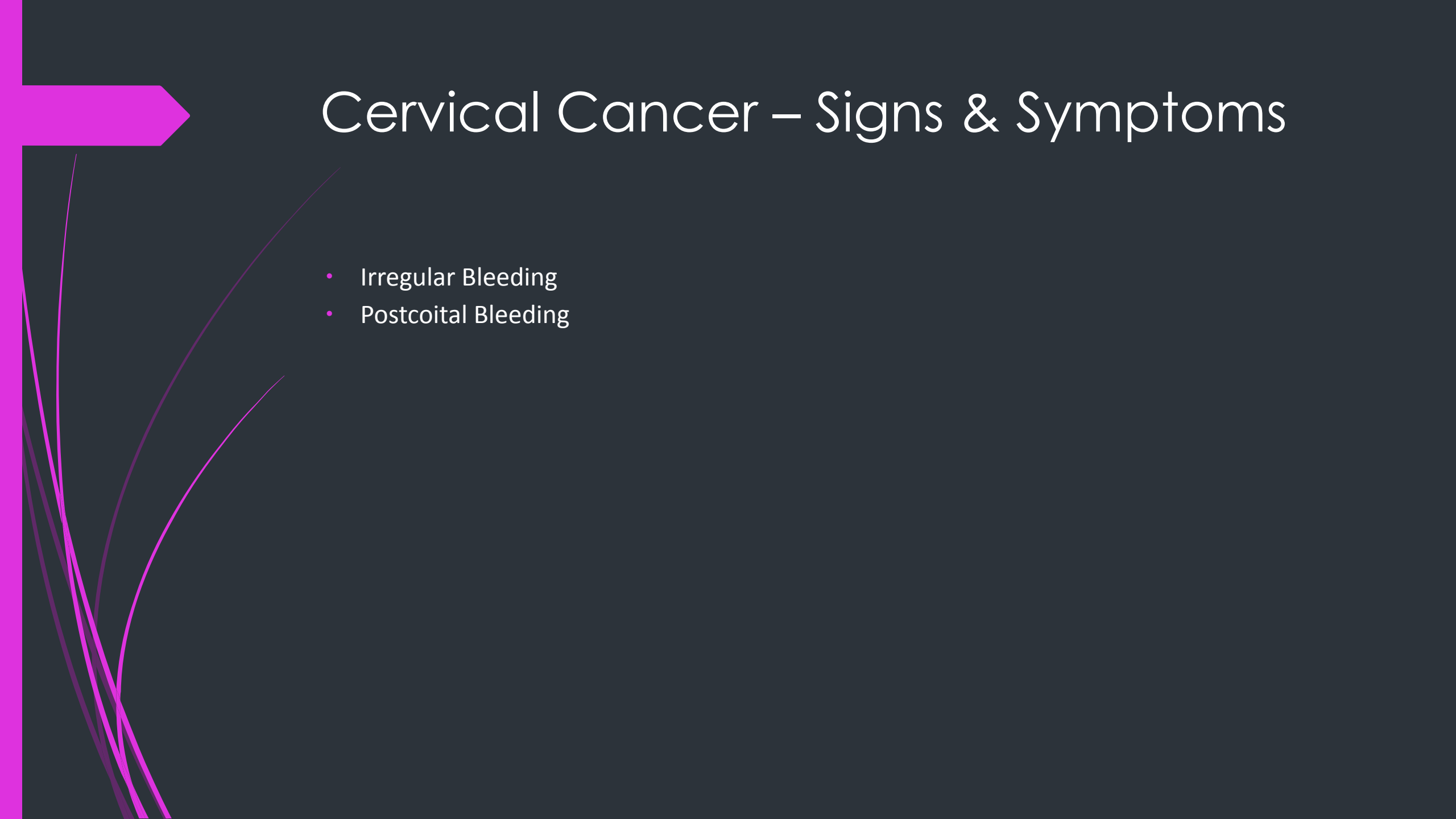
Cervical Cancer –

- Screen Age 21-65
- Immunocompromised
- Primary high-risk HPV screening with reflex cervical cytology
- Cervical cytology with HPV co-test
- Cervical cytology with reflex HPV
- HPV swab



Cervical Cancer – Risk Factors

- HPV
 - Early onset sexual activity
 - Multiple sexual partners
 - A high-risk sexual partner
 - History of sexually transmitted infections
 - Early age at first birth
 - History of vulvar or vaginal neoplasia
 - Immunosuppression
- Low socioeconomic status
- Oral contraceptive use
- Cigarette smoking
- Genetics
- Partners not circumcised



Cervical Cancer – Signs & Symptoms

- Irregular Bleeding
- Postcoital Bleeding



Cervical Cancer – Diagnosis

- Cervical Cytology
- Pelvic Exam
- Biopsy
- Colposcopy



Cervical Cancer – Treatment

- FIGO Staging
- Surgery
- Radiation
- Adjuvant Therapy



Cervical Cancer – Prevention



Vaccination





Prostate Cancer

- 2nd most common cancer in males



Prostate Cancer – Risk Factors

- Increasing age
- African American males
- Family history of prostate cancer
- Family history of breast cancer
- Known *BRCA1* or *BRCA2* mutation
- Polygenic risk score (PRS)
- Prior prostate biopsy



Prostate Cancer - Screening

- Controversial
 - Age 40-45
 - Race
 - Family history
 - Age > 50
 - Annual
 - Discontinue
 - Age > 69
- Prostate-specific antigen (PSA)
 - Digital rectal exam (DRE)



References

- <https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/breast-cancer-screening>
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Thank you

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