Cervical Cancer Screening and Prevention, 2019

Anita L. Nelson, MD
Professor and Chair of Obstetrics & Gynecology, Western University of Health Sciences
Professor Emeritus, Obstetrics & Gynecology, David Geffen School of Medicine at UCLA
Clinical Professor Obstetrics & Gynecology, University Southern California

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Learning Objectives
At the end of this presentation, the participant will be able to:

- Estimate the burden of disease caused by HPV for genital and oropharyngeal disease.
- List the current recommendations for screening for HPV-related cancers.
- Identify resources to consult for management of abnormal cervical screening tests.
- Describe the impact vaccines may have on future cancer screening programs.

Cervical Cancer: Global Perspective
- Third most common cancer in women
- In 2012: 528,000 cases
  - 266,000 deaths
  - 84% of cases in developing countries
- Sensitivity of cytology in detecting
  - Preinvasive squamous cancer 81%
  - Preinvasive adenocarcinoma 42%


U.S. Incidence of Cervical Cancer
- In US in 2019
  - 13,170 new cases
  - 4,250 deaths
  - 70% reduction from 1950’s due to Pap smear screening
- Cervical cancer is disease of economically disadvantaged—elderly, minorities and low socioeconomic status
- Types of cervical carcinoma: squamous 66%; adenocarcinoma 27.6%


Cervical Cancer: Impact of Screening: Remaining Gaps

- About 50% of US cervical cancers occur in:
  - Women never screened
- Another 10% US cervical cancers
  - Women not screened in past 5 years
- Screening fails
  - Low resource, medically underserved regions rates 7 times higher
  - Socioeconomic, geographic and/or racial disparities


HPV and Cervical Carcinoma

- Cervical cancer—first major solid tumor to be virally induced in essentially every case
- HPV DNA present in more than 99% of cervical cancer. Also in metastases
- HPV genes E6 and E7 integrated into host genome. Transforming proteins encoded by these genes are tumorigenic
- Persistent HPV infection is associated with high relative risk for SIL, particularly for HPV types 16 and 18


HPV Infection Prevalence

- Almost every person will acquire an HPV infection at some time in life
- 79 million Americans currently infected
- 14 million newly infected people each year
- Each year 42,700 new cases of cancer are found in parts of the body where HPV found
  - HPV causes about 33,700 of these cancers
- Cervical cancer is the only HPV cancer routinely screened for
  - Other HPV-related cancer may not be detected until they cause problems
  - Preventing infections is a priority

HPV Vaccine Information for Clinicians. Found at: www.cdc.gov/hpv

Genital Warts Affect Men and Women

- Over 2 years, ~60% of men and women with incident detection of HPV Type 6 or 111 developed genital warts.2,3

Genital Warts: Important Considerations

- HPV types 6 and 11 are responsible for >90% of anogenital warts1
- Anogenital warts are common and highly contagious2,3
  - May be a source of concern and anxiety for patients4
  - Subclinical infections may be transmitted without patients being aware5
  - Latency period of 3 weeks to 6 months; most develop within 3 months after infection6
  - Commonly recur despite treatment because eradication of the virus is not possible3,6

Clinical Manifestations of Genital Warts

- CONDYLOMATA ACUMINATA
- KERATOTIC FLAT WART
- FLAT CERVICAL CONDYLOMA

Natural Course of HPV Infection

- Incubation (1-8 Mo.)
- First Lesion
- Immune Response
- About 9 mo
- Late Stage
- Host Containment (3-6 Mo.)
- Active Growth (3-6 Mo.)
- Sustained clinical remission
- Persistent or recurrent disease

HPV Overview

- Human papillomaviruses (HPV) very common family of virus that infect epithelial tissue
- More than 150 types identified
- 40 HPV types can infect mucosal epithelial cells
- Genitals, mouth, throat
- Most infections asymptomatic and resolve spontaneously or at least become undetectable
- Some infections persist and can lead to cancer

Principles Underlying Screening Recommendations

- Virtually every sexually active person will be exposed to HPV
- Most HPV infections are transient
- High risk-HPV infections take longer (> 24 months) than low risk HPV
- Significant cervical dysplasia is caused by persistent HPV infection
Prevalence of Minor Precursors, Major Precursors, and Invasive Cancer

Risk Factors For Cervical Dysplasia and Cancer: Multiple Sexual Partners

<table>
<thead>
<tr>
<th>Number of Sexual Partners</th>
<th>Relative Risk Without Smoking</th>
<th>Relative Risk With Smoking</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2.37</td>
<td>4.7</td>
</tr>
<tr>
<td>3-5</td>
<td>5.41</td>
<td>10.8</td>
</tr>
<tr>
<td>6+</td>
<td>6.07</td>
<td>12.1</td>
</tr>
</tbody>
</table>

ACOG Screening Recommendations

<table>
<thead>
<tr>
<th>Age/ Condition</th>
<th>Screening</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 21</td>
<td>No screening</td>
</tr>
<tr>
<td>21-29</td>
<td>Cytology alone Q 3 years</td>
</tr>
<tr>
<td>30-65</td>
<td>HPV and cytology &quot;co-testing&quot; Q 5 years</td>
</tr>
<tr>
<td></td>
<td>Cytology alone Q 3 years</td>
</tr>
<tr>
<td>OR</td>
<td>No screening following adequate prior negative screening</td>
</tr>
<tr>
<td>&gt; 65</td>
<td>No screening if no prior ≥ CIN 2 in prior 20 years</td>
</tr>
</tbody>
</table>

A 67 year old G7P7 woman who has never had a pap smear test is referred for well woman care. She denies any recent abnormal bleeding, vaginal discharge or sexual contact for last 12 years. She has never smoked tobacco or consumed alcohol. What examinations and tests should she have to evaluate for pelvic organ carcinoma?

A. No tests  
B. Cytology test  
C. Cytology test + HP-HPV test  
D. Colposcopy

Conditions for Discontinuation for Cervical Cytology Discontinuation

- 3 consecutive normal pap smears with satisfactory samples in last 10 years  
- No abnormal tests in that time frame  
- No ≥ CIN2 in last 20 years

New UPPSTF Recommendations for Cervical Cancer Screening

<table>
<thead>
<tr>
<th>Population Age</th>
<th>Screening Recommendations</th>
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<tbody>
<tr>
<td>21-29 Years</td>
<td>Every 3 years with cytology alone</td>
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<td>30-65 Years</td>
<td>Every 5 years with hrHPV testing alone, or</td>
</tr>
<tr>
<td></td>
<td>Every 5 years with contesting</td>
</tr>
<tr>
<td>&lt; 21 years, &gt; 65 years, with adequate prior screening, and women who have had a hysterectomy</td>
<td>Do not screen</td>
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</table>

Evaluation of Abnormal Pap Smear
- Depends on patient’s age and evidence of high risk HPV
- Reflex HPV testing now, repeat testing later
- Colposcopy-directed biopsy
- Endocervical curettage, if indicated
- Treatment: destroy dysplastic cells with
  - Ablation of ectocervix
  - LEEP, laser, cryotherapy
  - Cone biopsy if involves endocervical cells
  - Laser, LEEP, cold knife

Histologic Diagnoses: Old Terminology
- CIN 1: Mild dysplasia:
  - Involves lower 1/3 of epithelium
  - Not malignant
- CIN 2: “Moderate dysplasia”
  - Premalignant
- CIN 3 and CIS
  - Involves almost all of epithelium
  - Severe dysplasia and carcinoma in situ
  - 20-30% progress to invasive disease

Revised Terminology for Cervical Histopathology
- Problems with prior CIN 2
  - Poor reproducibility
  - Agreement in only 13-43% of cases
  - No clear clinical meaning
  - Usually combined with CIN 3
  - Many represent mixture of cells
- Intermediate diagnosis of CIN 2 to soon be resolved into either low grade LSIL or high grade SIL

ASCPC App: Essential Resource
- Screening guidelines. Choose one:
  - Consensus
  - Primary HPV screening
  - USPSTF screening
- Management
  - Age, HPV status, pregnancy, initial cytology
  - Get algorithm
  - Provides Next step options, select choice
  - Next management algorithm and risk of CIN3+
- Updates automatically
A 29 year old woman with LSIL on pap smear. No previously abnormal pap smears. New sex partner 9 months ago. No HPV test was done. What should we do next?

A. HPV testing  
B. Colposcopy  
C. Repeat testing in 12 months

A 47 year old woman presents with HSIL. Her colposcopy was not satisfactory. A diagnostic LEEP cone was performed as was an ECC above the LEEP site. Hemostasis was challenging. Her remaining cervical length is 2.5 cm. Her ECC was unsatisfactory. What are your treatment options? Check all that apply:

A. Cytology at 6 and 12 months  
B. Co-testing at 12 and 24 months  
C. Cytology and ECC at 4-6 months  
D. Repeat diagnostic excisional procedure  
E. Hysterectomy

Overview of Treatments
- Ablative treatments: destroy affected cervical tissue.
  - Cryotherapy
  - Laser ablation
  - Electrofulguration
  - Cold coagulation
- Excisional methods: provide tissue specimen
  - Cold-knife conization
  - LEEP/LLETZ +/- conization
  - Laser conization
  - Electrosurgical needle conization

Comparisons of Treatments

- All ablative and excisional modalities, (except cryotherapy), have similar efficacy in:
  - Eliminating CIN
  - Reducing risk of future invasive diseases
- Treatment failures: 5-15%
  - Most failures occur within 2 years
- Risk of invasive disease after treatment:
  - 56/100,000 treated women in 20 years
  - 10 times higher than general population

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Persistent HPV: Clinical Significance

- Double blind, randomized, controlled screening study
  - 1997-2000 12, 527 Swedish women 32-38 years
    - Cytology + HPV testing vs. cytology alone
  - 341 HR-HPV+, cytology negative
    - 194 long term follow-up (13 years)
      - 40 (20%) had persistence – all developed $\geq$ CIN2 in 7 years
  - HPV testing is the crystal ball that tells us a patient’s risk of having precancer or cancer in the future

Primary Screening High Risk HPV

- HPV FOCAL trial
  - HPV testing vs. cytology
    - More colposcopies early, fewer later
    - Earlier detection of precancer

<table>
<thead>
<tr>
<th>Incidence Rate (1000 (95% CI) at 48 Months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPV</td>
</tr>
<tr>
<td>CIN 3+</td>
</tr>
<tr>
<td>CIN2+</td>
</tr>
</tbody>
</table>

HPV Screening Algorithm
Number of HPV-Associated and Attributable Cancer Cases per Year

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>% HPV-Related</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervix</td>
<td>11,866</td>
<td>91</td>
<td>10,751</td>
</tr>
<tr>
<td>Vagina</td>
<td>846</td>
<td>75</td>
<td>635</td>
</tr>
<tr>
<td>Vulva</td>
<td>3,934</td>
<td>69</td>
<td>2,707</td>
</tr>
<tr>
<td>Penis</td>
<td>1,269</td>
<td>63</td>
<td>803</td>
</tr>
<tr>
<td>Anus</td>
<td>6,530</td>
<td>91</td>
<td>5,957</td>
</tr>
<tr>
<td>Oropharynx</td>
<td>18,266</td>
<td>70</td>
<td>12,885</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>42,671</strong></td>
<td><strong>79</strong></td>
<td><strong>33,737</strong></td>
</tr>
</tbody>
</table>

Epidemiology of Anal Cancer

- Estimated ~8,300 new cases in the US (2019)
- Incidence increasing by 2% per year
- Lifetime risk for someone born in the US today is ~1 in 600 men and women

HPV Persistent Infection

- Persistent infection with high-risk (oncogenic) HPV types can lead to:
  - Cervical, vaginal, vulvar cancer in women
  - Penile cancer in men
  - Oropharyngeal and anal cancer in both men and women
- HPV 16,18 account for 80% of HPV-related cases
- HPV 6,11 cause almost all genital warts and laryngeal papilloma
- Also can cause low grade cervical cell abnormalities

Vulvar and Vaginal Cancers

- In 2019 it is estimated that:
  - ~6,070 new case of vulvar cancer will be diagnosed
  - ~5,350 new cases of vaginal and other genital cancer will be diagnosed
- Over the past 25-30 years, the incidence of vulvar cancer has slightly increased, especially among women, while during the same time span, the incidence of vaginal cancer has slightly decreased.
- ~40-50% of vulvar cancers caused by HPV types 16 & 18
- ~70% of vaginal cancers caused by HPV types 16 & 18

Low- and High-Grade AIN

Anal Cancer Affects Men and Women

- Men and women with a genital HPV infection are at risk for anal cancer, because HPV can spread throughout the anogenital region.
- Anal intercourse significantly increases the risk of anal cancer; however, anal cancer can occur in heterosexual males.
- In the US, it is estimated that women account for nearly 2/3 of cases of anal cancer.
- Risk of anal cancer is elevated among women with cervical and vulvar cancers.


Low- and High-Grade AIN

- No national screening guidelines exist for anal cancer in men or women.
- Therefore, many people are diagnosed when the disease is more advanced.


Oropharyngeal Cancers

- Head and neck cancers are 6th most common cancer worldwide.
- 53,000 cases pharynx and oral cancer expected in US in 2019.
- 3% of all cancers.
- Historically most common risk factors: tobacco and alcohol use.
- Today HPV implicated ever more commonly.


Oropharyngeal Cancers

- Result of smoking cessation.
- Prevalence of HPV-positive oropharyngeal squamous.
- All cancer in US.
  - 1980 – 20%
  - 2014 – 70% (90% HPV-16)
- May surpass cervical cancer by 2020


HPV Vaccine History

- Worldwide, HPV accounts for 5% of all cancers.
- Anti-16 vaccine first developed as proof of concept. Tested, but not marketed.
- Bivalent 16, 18 version FDA approved 2009.
  - UK first choice.
  - Anti-cancer option in US.
- Quadrivalent 16,18,6,11 FDA approved 2006 for women; 2009 for men.
- 9-valent 16,18,6,11,31,33,45,52 and 58 – 2014*
  - Extended to age 45 for men and women 2018 (FDA).

HPV Vaccine Information for Clinicians. Found at: www.cdc.gov/hpv

Burden of Disease from 7 Oncogenic HPV Types in 9-Valent Vaccine

- Since 2016 9-valent is only HPV vaccine available in US.
- Of the 32,500 cancers caused by HPV in US each year, 30,000 are caused by HPV types that could have been prevented by the 9-valent HPV vaccine.
Other HPV-Related Disease Caused by 9 HPV Types in US in 2018

<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>Estimated Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-grade cervical precancers</td>
<td>216,000</td>
</tr>
<tr>
<td>Genital warts</td>
<td>320,000</td>
</tr>
<tr>
<td>Low-grade cervical lesions</td>
<td>468,700</td>
</tr>
</tbody>
</table>

Efficacy Against Premalignancies Caused by HPV Types 6,11,16 & 18

<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>Efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervical, HPV 16- &amp; 18-related CIN 2/3 or AIS</td>
<td>98%</td>
</tr>
<tr>
<td>Vulvar/Vaginal, HPV 16- &amp; 18-related VIN 2/3 &amp; VAIN 2/3</td>
<td>100%</td>
</tr>
<tr>
<td>Anal, HPV 6-, 11, 16- &amp; 18-related AIN 2/3</td>
<td>75%</td>
</tr>
<tr>
<td>Genital warts, HPV 6- &amp; 11-related</td>
<td>89% in males, 99% in females</td>
</tr>
</tbody>
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Efficacy Against Premalignancies Caused by HPV Types 31, 33, 45, 52 & 58

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HPV 9-Valent Vaccine

FDA Indications: Women

- HPV 9-valent is a vaccine indicated in females
  - Ages 9 thru 45 years
  - Prevention of:
    - Cervical, vulvar, vaginal, & anal cancers
    - HPV Types 16, 18, 31, 33, 45, 52 & 58
    - Precancerous or dysplastic lesions
    - HPV Types 6, 11, 16, 18, 31, 33, 45, 52 & 58
    - Genital warts
    - HPV Types 6 & 11

FDA Indications: Men

- HPV 9-valent is a vaccine indicated in males
  - Ages 9 thru 45 years
  - Prevention of:
    - Anal cancers caused by
      - HPV Types 16, 18, 31, 33, 45, 52 & 58
      - Precancerous or dysplastic anal lesions
      - HPV Types 6, 11, 16, 18, 31, 33, 45, 52 & 58
    - Genital warts
    - HPV Types 6 & 11

CDC/AAP/... Recommendations

- 9-valent HPV vaccine childhood
  - 11-12 year old adolescents; 2 dose regime
    - May start as early as age 9
- Catch up vaccines; 3 dose regime
  - Men 13-21 years
  - Women 13-26 years
  - Men who have sex with men, transgender people and people with certain immunocompromising conditions 22-26 years

HPV Vaccine Information

HPV 9-Valent Vaccine

FDI Indications: Women

Ages 9 thru 45 years
Prevention of:
- Cervical, vulvar, vaginal, & anal cancers
- HPV Types 16, 18, 31, 33, 45, 52 & 58
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  - Men who have sex with men, transgender people and people with certain immunocompromising conditions 22-26 years

HPV Vaccine Information
Limitations of Use
HPV 9-Valent Vaccine

- HPV 9-valent is not a treatment for existing
  - Genital lesions, cervical, vulvar, vaginal and anal cancers; or cervical intraepithelial neoplasia (CIN), vulvar intraepithelial neoplasia (VIN), vaginal intraepithelial neoplasia (VAIN), or anal intraepithelial neoplasia (AIN)
- HPV does not cause all vulvar, vaginal & anal cancers
- HPV 9-valent only protects against those caused by HPV types in the vaccine
- Vaccination with HPV 9 valent may not result in protection in all who receive the vaccine

Uptake of HPV Vaccine in US

- 2017 US estimates
  - 49% of adolescent 13-17 years, up-to-date
    - 53.1% girls; 44.3% boys
  - 65.5% received at least one dose
    - 68.6% girls; 62.6% boys
  - Compared to Tdap ≥ 1 dose 88.7%

Sexual Activity-Related Outcomes After HPV Vaccination of 11- to 12-year-Olds

- HPV vaccination in 11- to 12-year old girls was not associated with increased sexual activity-related outcomes

Safety

- The vaccine cannot transmit/cause HPV infection
  - It contains no viral DNA or RNA
  - Only antigens are the proteins expressed on the viral capsid (virus like particle vaccine)
- Over 100 million doses of the HPV vaccine have been distributed in the US
- CDC and FDA have been monitoring safety for over 10 years

Safety Profile
HPV 9-Valent Vaccine Post Any Dose

<table>
<thead>
<tr>
<th>Population (n)</th>
<th>Injection-site %</th>
<th>Systemic %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pain</td>
<td>Swelling</td>
</tr>
<tr>
<td>Females 9-15 yrs (n=299)</td>
<td>89.3</td>
<td>47.8</td>
</tr>
<tr>
<td>Females 16-26 yrs (n=7,071)</td>
<td>89.9</td>
<td>40.0</td>
</tr>
<tr>
<td>Males 9-15 yrs (n=639)</td>
<td>71.5</td>
<td>26.9</td>
</tr>
<tr>
<td>Males 16-26 yrs (n=1,394)</td>
<td>63.4</td>
<td>20.2</td>
</tr>
</tbody>
</table>

- Systemic adverse reactions after any dose in 9 thru 26 year olds at a frequency of ≥ 10%

Effectiveness Observed in Use

- HPV vaccine introduced in US 2006
  - By 2014 the HPV infections responsible for majority of HPV cancers and genital warts
    - decreased by 71% in treated women
    - decreased by 61% among treated men
Estimated Number of Diagnosed CIN2+ Cases by Age Group  
United States, 2008 and 2016


Estimated Number of Diagnosed CIN 2+ Cases  
by Human Papillomavirus (HPV) Type and Age Group  
United States, 2008


Herd Immunity?

<table>
<thead>
<tr>
<th>Vaccination Status</th>
<th>aOR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-valent vaccine-type HPV</td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>0.25 (0.18 to 0.35)</td>
</tr>
<tr>
<td>Vaccinated</td>
<td>0.18 (0.12 to 0.26)</td>
</tr>
<tr>
<td>Unvaccinated</td>
<td>0.95 (0.56 to 1.62)</td>
</tr>
<tr>
<td>4-valent vaccine-type HPV</td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>0.18 (0.12 to 0.27)</td>
</tr>
<tr>
<td>Vaccinated</td>
<td>0.13 (0.08 to 0.22)</td>
</tr>
<tr>
<td>Unvaccinated</td>
<td>0.50 (0.26 to 0.97)</td>
</tr>
<tr>
<td>5 HPV types in the 9-valent by not the 4-valent vaccine</td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>0.44 (0.30 to 0.64)</td>
</tr>
<tr>
<td>Vaccinated</td>
<td>0.26 (0.16 to 0.42)</td>
</tr>
<tr>
<td>Unvaccinated</td>
<td>1.90 (1.09 to 3.34)</td>
</tr>
</tbody>
</table>


Proportions of women vaccinated across 4 study waves infected with any vaccine-type HPV, adjusted for propensity scores.

Proportions of women who were unvaccinated across 4 study waves infected with any vaccine-type HPV, adjusted for propensity scores.
Preparing for (More) Change

- At-home HPV tests may be key to reaching patients
  - Currently used in Australia, Netherlands
  - None approved yet in US
- Study of underserved women – 80% returned kits
  - 25% positive for HR-HPV
- Comparison of detection rates HR-HPV
  - Self collected office 15.5%
  - Clinical collection office 11.4%
  - Self collection home 12.4%
- Impacts of vaccination – increased false positives

Screening for Colorectal Cancer

2019
Colorectal CA-Basics

- Begins in the colon or rectum (*colorectal cancer*)
- Usually develops from pre-cancerous changes or growths in the lining of these organs
- These growths are called *polyps*
- 2nd leading cause of cancer-related death in the US
WHAT IS COLORECTAL CANCER?

Colorectal cancer, or CRC, is the third most commonly diagnosed cancer in both men and women in the United States, and the second leading overall cause of cancer deaths.

WHO GETS CRC?

More than 90% of CRCs occur in people age 50 and older.

HOW DOES CRC DEVELOP?

1. Most CRC begins as a non-cancerous growth called a polyp that forms on the innermost layer of the colon or rectum. Some polyps can become cancerous.
2. As a CRC tumor develops, it grows through several layers of tissue.
3. Eventually the tumor may reach nearby lymph and blood vessels, and may even spread to lymph nodes and distant sites in the body.

HOW MANY ARE AFFECTED?

More than 140,000 Americans are diagnosed each year. That's about 16 every hour.

Each year, 28,700 people are diagnosed with metastatic CRC, or advanced stage disease.

50,000 Americans will die from the disease each year.

CRC incidence has been increasing in adults <50.

Colorectal CA
CATCHING CRC EARLY IS IMPORTANT

Because the early stages of the disease do not typically cause symptoms, the American Cancer Society recommends screening tests beginning at age 50 for those at average risk for CRC.

9 out of 10 individuals diagnosed with early stage CRC that has not spread (metastasized) beyond the colon or rectum SURVIVE 5 YEARS4 (and many live much longer)

1 out of 10 individuals with advanced stage CRC that has spread (metastasized) to other organs such as the lungs or the liver SURVIVES 5 YEARS4

WHAT ARE SOME WARNING SIGNS?

- Changes in bowel habits, such as diarrhea, constipation or narrowing of the stool
- A constant need to evacuate the bowel
- Blood in the stool
- Weakness & fatigue
- Cramping or abdominal pain
- Unintended weight loss

References:

Colorectal CA
Colon CA-Progression

Colon Polyp to Cancer takes about 10-15 years

Sporadic 80%

Familial 15%

Hereditary 4%

IBD 1%
Risk factors include:

- Family or personal history of colon cancer or polyps (FAP, Lynch)
- Chronic inflammatory bowel disease (UC, Crohn’s)
- Use of ETOH or cigarettes and other tobacco products
- High-fat, red meat diet
- Physical inactivity/Obesity
- DM2

Factors associated with decreased risk for CRC

- Vitamin containing folic acid
- ASA and other NSAID’s
- Post menopausal HRT
- Ca supplementation
- Selenium
- Consumption of fruits, vegetables and fiber
Clinical Presentation

• Proximal (right sided) lesions present with symptoms caused by anemia – fatigue, weight loss, shortness of breath, lightheadedness, mahogany feces caused by occult bleeding

• Distal (left sided) lesions present with symptoms of obstruction, changes in BM pattern, postprandial colicky abdominal pain, hematochezia

Abdominal pain 44%
Change in bowel habit 43%
Hematochezia or melena 40%
Weakness 20%
Anemia without other gastrointestinal symptoms 11%
Weight loss 6%
Some patients have more than one abnormality
15 to 20% of patients have distant metastatic disease at the time of presentation
Why Screen?

3rd most common cancer in both men and women in the U.S. (not including skin cancer).

2nd leading cause of cancer-related death in the U.S. for men and women combined.

It’s estimated that more than half of all cases could be prevented by regular colonoscopy screening!
Prognosis and 5 year Survival Rates for Colon CA

- Stage I (T1-2N0) - 93%
- Stage IIA (T3N0) - 85%
- Stage IIB (T4N0) - 72%
- Stage IIIA (T1-2 N1) - 83%
- Stage IIIB (T3-4 N1) - 64%
- Stage IIIC (N2) - 44%
- Stage IV - 8%
“Despite the effectiveness and cost-effectiveness of screening, only 60% - 65% of the eligible population is current with screening, a rate that has fallen short of the goal of 80% by 2018.”

—Thomas F. Imperiale, MD, professor of medicine at Indiana University School of Medicine
Options for Screening

**Flexible Sigmoidoscopy**
- **Benefits:** Fairly quick, Few complications, Minimal bowel preparation, Does not require sedation or a specialist
- **Limitations:** Views only one-third of colon, Cannot remove large polyps, Small risk of infection or bowel tear, Slightly more effective when combined with annual fecal occult blood testing, Colonoscopy still needed if abnormalities are detected, Limited availability
- **Test time interval:** every 5 years

**Colonoscopy**
- **Benefits:** Examines entire colon, Can biopsy and remove polyps, Can diagnose other diseases, Required for abnormal results from all other tests
- **Limitations:** Full bowel preparation needed, Can be expensive, Sedation of some kind usually needed, necessitating a chaperone to return home, Patient may miss a day of work, Highest risk of bowel tears or infections compared with other tests
- **Test time interval:** 10 years

**Double-contrast Barium Enema**
- **Benefits:** Can usually view entire colon, Few complications, No sedation needed
- **Limitations:** Full bowel preparation needed, Some false positive test results, Cannot remove polyps or perform biopsies, Exposure to low-dose radiation, Colonoscopy necessary if abnormalities are detected, Very limited availability
- **Test time interval:** 5 years

**Computed Tomographic Colonography**
- **Benefits:** Examines entire colon, Fairly quick, Few complications, No sedation needed, Noninvasive
- **Limitations:** Full bowel preparation needed, Cannot remove polyps or perform biopsies, Exposure to low-dose radiation, Colonoscopy necessary if abnormalities are detected, Not covered by all insurance plans
- **Test time interval:** 5 years

**High-Sensitivity Guaiac-based Fecal Occult Blood Test (FOBT)**
- **Benefits:** No bowel preparation, Sampling is done at home, Low cost, Noninvasive
- **Limitations:** Requires multiple stool samples, Will miss most polyps, May produce false-positive test results, Pre-test dietary limitations, Slightly more effective when combined with a flexible sigmoidoscopy every five years, Colonoscopy necessary if abnormalities are detected
- **Test time interval:** Annual

**Fecal Immunochemical Test (FIT)**
- **Benefits:** No bowel preparation, Sampling is done at home, Low cost, Noninvasive
- **Limitations:** Requires multiple stool samples, Will miss most polyps, May produce false-positive test results, Slightly more effective when combined with a flexible sigmoidoscopy every five years, Colonoscopy necessary if abnormalities are detected
- **Test time interval:** Annual

**Stool DNA Test**
- **Benefits:** No bowel preparation, Sampling is done at home, Requires only a single stool sample, Noninvasive
- **Limitations:** Will miss most polyps, High cost compared to other stool tests, New technology with uncertain interval between testing, Colonoscopy necessary if abnormalities are detected
- **Test time interval:** uncertain
### TABLE 1. Screening tests for colorectal cancer

<table>
<thead>
<tr>
<th>Tests That Detect Cancer</th>
<th>Frequency</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
</table>
| Guaiac fecal occult blood test (gFOBT) | Annual | Noninvasive | • Requires pre-test medication and diet restrictions  
• Requires two samples from three consecutive bowel movements  
• Positive results require follow-up colonoscopy |
| Fecal immunochemical test (FIT) | Annual | • Noninvasive  
• More specific than gFOBT for lower GI bleeding  
• No pre-test medication or diet restrictions | Positive results require follow-up colonoscopy |
| Stool DNA testing (sDNA) | Undetermined | Noninvasive | • Requires single stool specimen >30 g sent in ice pack  
• Detects some but not all advanced cancers  
• No determination on what to do when DNA is positive and follow-up colonoscopy is negative  
• Most expensive of stool tests |

<table>
<thead>
<tr>
<th>Tests That Detect Adenomas and Cancer</th>
<th>Frequency</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
</table>
| Flexible sigmoidoscopy (FSIG) | Every 5 years (may be extended by combining with annual gFOBT or FIT) | • Requires minimum preparation (enemas), but full colonoscopy prep yields better results  
• Does not require sedation | Invasive  
• May cause patient discomfort, leading to reluctance to have subsequent tests  
• Limited by extent of scope insertion  
• Positive results require colonoscopy  
• Rarely colonic perforation |
| Colonoscopy | Every 10 years | • Visualizes entire bowel  
• Allows same-session biopsy and polypectomy | Invasive  
• Patients find preparation unpleasant  
• Time (one day for prep + one day for exam and recovery); driver required  
• Risk of cardiopulmonary and other anesthesia effects, postpolypectomy bleeding, perforation |
| Double-contrast barium enema (DCBE) | Every 5 years | • Minimally invasive  
• Evaluates entire colon  
• Detects most cancers and majority of polyps | Extensive preparation, some discomfort  
• No opportunity for biopsy or polypectomy |
| CT colonography (CTC) | Every 5 years, still under review | • Minimally invasive  
• Procedure takes 10 minutes; no sedation or recovery time required | Prep similar to colonoscopy  
• Polyps >6 mm require follow-up colonoscopy  
• Risk of cumulative radiation exposure |
Colonoscopy - most frequently used in US
Sigmoidoscopy

Advantages: Bowel prep less onerous, can be performed without sedation

Limitations: Screens up to splenic flexure only, can cause perforation, abnormal tests require f/u colonoscopy
Double Contrast Barium Enema (DCBE)

• Uses X-rays and Barium to find abnormal growths in the colon
• Low risk and often less expensive than a colonoscopy.
• Can also help detect polyps, diverticulum (a pouch pushing out from the colon) and structural changes in the large intestine.

THE PREP
• Restrict intake of dairy products and adopt a clear liquid diet for 24 hours beforehand

THE PROCEDURE
• Pt lies lateral recumbent and a well-lubricated rectal tube is inserted through the anus to slowly administer the barium into the rectum and colon.
• As the barium fills the intestine, X-rays of the abdomen are taken to distinguish significant findings and help detect abnormal growths. The process lasts for about 30 to 45 minutes.

• ADVANTAGES- Done without sedation, Very low risk, Less expensive than a colonoscopy, Identifies lesions in the entire colon, Accurate for finding abnormalities, such as narrowed areas or pockets or sacs, in the intestinal wall, Can find cancer in earliest stage, when most treatable, Slight risk of perforation, Less expensive option to colonoscopy
• DISADVANTAGES- Some may find the test uncomfortable, Availability is decreasing; usually only for those who cannot undergo colonoscopy, Uses X-ray radiation
Fecal Immunochemical Test (FIT)

• Detects blood in stool without Prep or Risk
• Similar to an FOBT, except the FIT test is newer and doesn’t require a restricted diet before. A FIT test may not detect blood from further up the digestive tract (such as the stomach), which means it is more specific to finding blood coming from the lower gastrointestinal tract than the FOBT.
• Can alter sensitivity and specificity based on threshold for positive result thus modifying test for specific population, or disease state
• Inexpensive, usually covered by insurance

**ADVANTAGES:** Easy to do, No special changes to diets or medicines, No liquids/prep to drink, Inexpensive; covered by most insurance, Done in privacy of your home and flexible for your schedule, More specific than guaiac FOBT; identifies human blood only

**DISADVANTAGES:** A number of tests are available; they use different antibodies and therefore differ in their sensitivities, Patients may find test unpleasant, May miss tumors that bleed in small amount or not at all, These tests may perform poorly without refrigeration in warm climates or if there are postal delays, Must be repeated every year
Guaiac Fecal Occult Blood Test (FOBT)

- Can detect small amounts of blood in stool but requires abstaining from red meat and certain medications for a number of days before. Avoid: Nonsteroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen (Advil), naproxen (Aleve) or aspirin (more than one adult aspirin per day), for seven days before testing, Vitamin C in excess of 250 mg daily from either supplements or citrus fruits and juices for three days before testing, Red meats for three days before testing, as the components of blood in the meat may cause the test to show positive.

- An FOBT is more specific to finding blood from further up the digestive tract, such as the stomach.

- No risk involved and generally covered by insurance, Average cost before insurance: about $5.

- Must be repeated yearly.

**ADVANTAGES**

- Inexpensive; covered by most insurance
- Can be simple to complete
- Can be completed in the comfort of your own home

**DISADVANTAGES**

- Cannot identify polyps; can only detect signs of cancer
- Will need a colonoscopy if test is positive
- Patients may find test unpleasant
- Requires strict adherence to the test protocol for the test to be accurate (restricted diet and multiple days of stool collection)
- High false positive rate — non-cancerous conditions may also cause blood in the stool and not specific for human blood
- May miss tumors that bleed in small amounts or not at all
tDNA

• In 2014, a new noninvasive test to detect colon and rectal cancer was approved by the Food and Drug Administration.
• Cologuard® was the first stool-based DNA colorectal cancer screening test available.
• Its development has offered hope that more people will be willing to be screened, driving down the rates of these cancers.
• While Cologuard is a potentially exciting advancement, many questions remain about the optimal use of stool-based testing, which detects the presence of red blood cells and DNA mutations that may be indicative of cancer.
FIT test has less false positives than FOBT?

• A. True
• B. False
Guidelines-ACG

American College Gastroenterology

• Colonoscopy **every 10 years, beginning at age 50**, remains the preferred CRC screening strategy.

• It is recognized that colonoscopy is not available in every clinical setting because of economic limitations. It is also realized that not all eligible persons are willing to undergo colonoscopy for screening purposes.

• In these cases, patients should be offered an alternative CRC prevention test (flexible sigmoidoscopy every 5–10 years, or a computed tomography (CT) colonography every 5 years) or a cancer detection test (fecal immunochemical test for blood, FIT).
Guidelines-ACG

Changes in this guideline from the 2000 ACG recommendations for screening

• Screening tests are divided into cancer prevention and cancer detection tests. Cancer prevention tests are preferred over detection tests.
• Screening is recommended in African Americans beginning at age 45 years.
• CT colonography every 5 years replaces double contrast barium enema as the radiographic screening alternative, when patients decline colonoscopy.
• FIT replaces older guaiac-based fecal occult blood testing. FIT is the preferred cancer detection test.
• Annual Hemoccult Sensa and fecal DNA testing every 3 years are alternative cancer detection tests.
• A family history of only small tubular adenomas in first-degree relatives is not considered to increase the risk of CRC.
• Individuals with a single first-degree relative with CRC or advanced adenomas diagnosed at age ≥60 years can be screened like average-risk persons.
Dna stool test is the least expensive test, therefore should be the first test used for screening colon cancer??

• A. True
• B. False
Screening for high-risk people – Emory University

• A first-degree relative (sibling, parent, child) who has had colorectal cancer or an adenomatous polyp:
  Screening should begin at age 40 years or 10 years before Dx
• Family history of familial adenomatous polyposis (FAP):
  Screening should begin at puberty
  Sigmoidoscopy - annually, beginning at age 10 to 12 years
  Colonoscopy - every five years
• Family history of hereditary nonpolyposis colorectal cancer (HNPCC):
  Screening should begin at age 21 years
  Sigmoidoscopy - annually, beginning at age 10 to 12 years
  Colonoscopy - every one to two years, beginning at age 20 to 25 years or 10 years younger than the earliest case in the family, whichever comes first
Screening for high-risk people – Emory University

- Personal history of adenomatous polyps
  - Screening should be based on pathological findings
  - Advanced or multiple adenomas (3 or greater): First follow-up colonoscopy should occur in 3 yrs
  - 1 or 2 small (< 1 cm) tubular adenomas: First follow-up colonoscopy should occur at 5 years

- Personal history of colorectal cancer:
  - After colon resection
  - Approximately six months after the surgery
  - If the colonoscopy performed at six months is normal, subsequent colonoscopy should be repeated at 3 years and then if normal, every 5 years

- Personal history of inflammatory bowel disease
  - Every one to two years after an eight year history of the disease with pancolitis or
  - Every one to two years after 15 years history of left-sided colitis or
  - For all patients beginning with eight to ten years of disease to document the extent of the disease

• The USPSTF recommends screening for colorectal cancer starting at age 50 years and continuing until age 75 years.
• The decision to screen for colorectal cancer in adults aged 76 to 85 years should be an individual one, taking into account the patient’s overall health and prior screening history.
• Adults in this age group who have never been screened for colorectal cancer are more likely to benefit.
• Screening would be most appropriate among adults who 1) are healthy enough to undergo treatment if colorectal cancer is detected and 2) do not have comorbid conditions that would significantly limit their life expectancy.
US Preventative Services Task Force (USPSTF) – 2016

**Screening guideline:**
- Begin at age 50 years; Continue until age 75 years
- Age 76-85 years: individualized decision; More beneficial for those who:
  - have never been screened before
  - are healthy enough to undergo treatment
  - do not have a significantly limited life expectancy
- Do not screen after age 85 years

**Risk stratification:**
- Did not specifically review evidence on screening in high risk individuals
US Preventative Services Task Force (USPSTF) – 2016

**Recommended methods:**
- None preferred over others
  - No head-to-head studies demonstrating that any strategy is more effective than others
  - Varying evidence on their effectiveness and strengths and limitations
- Numerous screening tests available:
  - Stool-based: gFOBT, FIT, FIT-DNA
  - Visualization: flexible sigmoidoscopy ±FIT, colonoscopy, CT colonography
  - Serology: SEPT9 DNA test

**Main points:**
- CRC screening substantially reduces deaths in adults aged 50-75
- Not enough US adults are using this preventive intervention
Colonoscopy should be done on everyone over the age of 50?

- A. True
- B. False
High risk defined as:
• Family history of CRC  -or-
• Advanced adenoma in a first-degree relative diagnosed at < 60 years  -or-
• 2 first-degree relatives diagnosed with advanced adenoma at any age

Screening guideline for high risk patients:
• Begin 10 years before age at diagnosis of youngest affected relative, or age 40 years (whichever is earlier)
• Colonoscopy every 10 years if only one first-degree relative with CRC and diagnosed at age ≥ 60 years
• Otherwise, colonoscopy every 5 years

Screening guideline for average risk patients:
• Begin screening at age 50
• African Americans – begin at age 45
US Multi-Society Task Force on Colorectal Cancer (MSTF) – 2017 AGA ACG ASGE

**First-tier screening methods:**
- Colonoscopy every 10 years  -or-
- Fecal immunohistochemical test (FIT) every year

**Second tier screening methods:**
- Computed tomography (CT) colonography every 5 years  -or-
- FIT-DNA test every 3 years  -or-
- Flexible sigmoidoscopy every 5 to 10 years

**May discontinue screening when:**
- Prior negative screenings and age ≥75 years  -or-
- <10 years of life expectancy
- Individualized decision
2018 Colorectal Cancer Screening Guideline
for men and women at average risk

TESTING OPTIONS
- Stool-based tests look for signs of cancer in a person’s stool.
- Visual exams such as colonoscopy or CT colonography, look at the inside of the colon and rectum for polyps or cancer.
- No matter which test you choose, the most important thing is to get tested.

Visit cancer.org/colonguidelines to learn more.

All positive results on non-colonoscopy screening tests should be followed up with a timely colonoscopy to complete the screening process. Talk to your doctor about screening, and contact your insurance provider about insurance coverage for screening.

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Average risk defined as no history of:

- Adenomatous polyps or CRC -or-
- Family history of CRC -or-
- Hereditary CRC syndrome (e.g., FAP, Lynch Syndrome) -or-
- Abdominal or pelvic radiation for a previous cancer -or-
- Inflammatory bowel disease

Screening guideline for average risk patients:

- Begin at age 45 years; Continue until age 75 years
- Age 76-85 years: individualized decision based on:
  - patient preference
  - health status and life expectancy
  - prior screening history
- Screening after age 85 is discouraged
American Cancer Society – 2018

**Recommended methods:**
- High-sensitivity stool-based test (every 1-3 years, depending on test) - or -
- Structural (visual) examination (every 5-10 years, depending on test)
- All positive non-colonoscopy screening tests should be followed up with a timely colonoscopy

**Methods not recommended:**
- Methylated Sept9 DNA serum biomarker
- Capsule endoscopy

**Risk stratification:**
- Did not specifically review evidence on screening in high risk individuals
### Guidelines Summary

<table>
<thead>
<tr>
<th></th>
<th>USPSTF, 2016</th>
<th>MSTF, 2017</th>
<th>ACS, 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average-risk patients</strong></td>
<td>• 50-75: screen&lt;br&gt;• 76-85: may screen&lt;br&gt;• &gt;85: do not screen</td>
<td>• 50-75 (45-75 if African American): screen&lt;br&gt;• &gt;75: may discontinue</td>
<td>• 45-75: screen&lt;br&gt;• 76-85: may screen&lt;br&gt;• &gt;85: do not screen</td>
</tr>
<tr>
<td><strong>High-risk patients</strong></td>
<td>Not reviewed</td>
<td>• Begin 10 years before age at diagnosis of youngest relative, or age 40 years&lt;br&gt;• Colonoscopy every 10 years if only one first-degree relative diagnosed at ≥60&lt;br&gt;• Colonoscopy every 5 years for all others at high risk</td>
<td>Not reviewed</td>
</tr>
<tr>
<td><strong>Preferred Methods</strong></td>
<td>None specified</td>
<td>• Colonoscopy every 10 years&lt;br&gt;-or-&lt;br&gt;• FIT every year</td>
<td>• High-sensitivity stool-based test every 1-3 years&lt;br&gt;• Structural (visual) exam every 5-10 years&lt;br&gt;• Colonoscopy if positive non-colonoscopy test</td>
</tr>
</tbody>
</table>
How is your state doing?
References


Gender Transition
Medical and Surgical Options
Disclaimer

All treatment options are off label. These are general guidelines and must be appropriately adapted to meet specific healthcare needs.
John Kowalczyk, D.O.
F.A.C.O.S.

Urology Group of Southern California, Los Angeles
Matthew 19:12
For there are eunuchs who were born that way, and there are eunuchs who have been made eunuchs by others—and there are those who choose to live like eunuchs for the sake of the kingdom of heaven. The one who can accept this should accept it.
Magnus Hirschfeld
Gender Confirmation: Hormone and Surgical Therapies
Christine Jorgensen
Georges Burou
Medical options

Testosterone Treatment
Estrogen Treatment
Progesterone Treatment
Androgen Blockers
Feminization

Breast Implantation
Orchiectomy
Genital Reconstruction Surgery
Masculinization

Chest Masculinization
Hysterectomy with Oophorectomy
Metoidioplasty and Phalloplasty
Masculinizing Chemical Therapies
Maculinizing - FTM

- Straight forward TT (Testosterone Therapy).
- The patient can be treated as a typical hypogonadal patient.
- Exam includes: physical with breast and Gyne (if not part of your routine refer for pelvic and PAP), CBC, CMP, Testo levels. (may not be easy to complete)
Testosterone Treatment

- Oral therapy has no safe alternative FDA approved at this time.
- Studies are under way evaluating safer oral agents. They are in phase 2 studies.
- Topical gels are safe and effective but very costly.
- Injectable are very effective and most cost effective. Can be painful.
- Pellets effective but very costly. They tend to dissolve poorly leaving palpable residue.
Effects of Testosterone Treatment

- Thickening of the vocal chords and deepening of the voice
- Facial hair growth (mustache and/or beard growth)
- Increased body hair growth (notably on arms, legs, chest, belly, and back)
- Increased body musculature
- Enlargement of the clitoris
- Cessation of menses (monthly periods)
Effects of Testosterone Treatment (continued)

- Potential hair loss at the temples and crown of the head, resulting in a more masculine hairline; possibly male-pattern baldness
- Migration of body fat to a more masculine pattern (i.e., fat deposits shifting from hips, thighs and buttocks to the abdomen area)
- Increased activity of the skin's oil glands (i.e., skin becomes more oily, which may result in acne)
- Increase in red blood cells (RBC)
Effects of Testosterone Treatment (continued)

• Change in cholesterol levels may occur-- the "good" cholesterol (HDL) may go down and the "bad" cholesterol (LDL) may go up.

• Scent of body odors and urine may change

• Skin may become rougher in feeling and/or appearance.

• Increase in sex drive
Testosterone Treatment

ASE

Polycythemia

Dvt

Hair

Cardiac

Skin

liver
Questions
Feminizing Chemical Therapies
Estrogen Treatment

- Premarin is a conjugated estrogen isolated from mare's urine.
- Premarin is a brand name protected. More costly than generic.
- Estradiol is a synthesized from from cholesterol.
- Pharmacy [checker.com](http://checker.com) shows that 90 tabs can be as low as $33.00.
Estrogen Treatment

- Since males have more testosterone and produce less estrogen, higher doses are needed.

- Typical starting dose is 2 mg BID generic. Premarin 1.25 mg BID. Titrate as clinically indicated.

- Easiest administration is oral form. Requires little on no skill.
**Estrogen Treatment**

- Topical application is safest route due to limited absorption and less toxicity.
- Can be more costly if not covered.
- Starting doses as low as 250 mcg applied every 2 days.
- Much slower rate of physiologic change.
Estrogen Treatment

- Injectables are the most effective therapy.
- More invasive approach.
- More painful approach.
- Estradiol cypionate 5-10mg IM every 2 weeks. Quicker half life.
- Estradiol Valerate 20-40 mg IM every 2 weeks. Slower half life.
Estrogen Treatment

- Pellets are costly.
- Most invasive.
- May leave scar tissue.
- Difficult to titrate.
Effects of Estrogen Treatment

- Breast tissue growth
- Softer, less coarse skin
- Lessening of body hair
- Loss of muscle mass
- Fat redistribution
Effects of Estrogen Treatment (continued)

- Hypogonadism (low Testosterone)
- Loss of libido
- Diminished erections
- Less hair loss
- Infertility
Estrogen Treatment ASE

- Liver toxicity
- DVT
- Cholesterol metabolism
- Mood changes
- HCT changes
- Fat distribution
Estrogen Treatment ASE

- Nausea
- Emesis
- Headaches
- Sterility (offer banking)
- ED/Libido
- Hot flashes
Progesterone

- Medroxy-progesterone
- Oral therapy
- Similar ASE to ERT
- Starting dose 10 mg daily either days 1-15 or QD.
Spironolactone

* steroidal antimineralocorticoid.
* antagonizes the action of aldosterone.
* antiandrogen properties by competing for receptor sites.
* introduced in 1959.
* causes diuresis.
* ASE include urinary frequency, ataxia, dry skin, rashes, electrolyte imbalance and immunosuppressive properties.
* Starting doses 50-100 mg daily.
Alpha-Reductase Inhibitors

- Blocks production of DHT.
- Does not block receptors.
- Generic agents very cost effective.
- May cause ED/libido issues.
- Decreases hair loss.
- Finasteride 5 mg daily
Clinical Monitoring

- Physical exam including testis and breasts.
- History
- Labs including: CBC, CMP, Cholesterol.
- Suggestive: PSA, Testosterone and estrogen levels.
Casodex (bicalutamide)

- Increasing discussions.
- Potent antiandrogen agent.
- Used in advanced prostate cancer. Usually indicates terminal condition.
- Higher rates of DVT and PE.
- Others ASE includes liver toxicity, GI problems and osteopenia.
- 50 mg daily.
- Not approved for use outside PCA and usually only covered for this condition.
Questions
Surgical Options

FTM / MTF
Female anatomy

FTM
Surgical

- Facial masculinization (uncommon)
- Chest masculinization
- Hysterectomy with or without oopherectomy
GRS FTM

- Phalloplasty
- Cosmetic concerns
- Stricture with urethra
- Functionality
- Graft failure
- Technically challenging
GRS FTM

- Metoidioplasty
- Release dorsal ligaments
- With or without urethroplasty
- Functionality
- Less invasive
Metoidioplasty

Holder slide
GRS FTM

- Labial flap to create urethra
GRS FTM

- Urethral extension with labia
GRS FTM

- Flap created with vascular bundles ready for revascularization
GRS FTM

- Distal urethra constructed with buccal mucosa and coronal development
Male anatomy

MTF
GRS MTF

- Can be partial or complete
- Orchietomy allows removal of testosteron
- Penis remains
- Less invasive
GRS MTF

- Facial feminization
- Tracheal shave
- Breast implants
- Electrolysis and laser
Orchiectomy

- Removal of testis
- Medical or technical term
- Castration is not a term that is commonly used
GRS MTF

- Complete GRS includes penectomy with orchiectomy
- Extensive surgery
- Prostate is NOT removed
GRS

- Extreme lithotomy
- Markings for flaps
GRS

- Penectomy
- Orchitectomy
- Urethral dissection
GRS

- Graft tissue to form neo-vagina
GRS

- Grafts repositioned and sutured
- Urethra anchored and catheterized
- Drains to prevent hematoma and seroma
GRS Complications

- DVT
- Flap failure
- Infection
- Not functional
- Urethral stenosis and strictures
- Bleeding
GRS Complications (continued)

- Pain
- Fistula
- Permanent scars
Change of Status

DMV has a one page form

Passport requires completion of an application with physician documentation under penalty of perjury

Change of birth certificate require application, documentation and court petition.
GRS

Questions