Taking Action Against Cervical Cancer Through Early Detection and Vaccination

Clinician Outreach and Communication Activity (COCA)

Webinar

November 20, 2014
Objectives

At the conclusion of this session, participants will be able to—

- Describe the epidemiology, natural history, and clinical features of cervical cancer.
- Discuss current recommendations and rationale for HPV vaccination and cervical cancer screening in the U.S.
- Identify opportunities for screening and vaccination and share evidence-based practices for clinicians and health departments.
Continuing Education Disclaimer

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TODAY’S PRESENTER (1)

Mona Saraiya, MD, MPH
Associate Director of the Office of International Cancer Control
Division of Cancer Prevention and Control
National Center for Chronic Disease Prevention and Health Promotion
Centers for Disease Control and Prevention
George Sawaya, MD
Obstetrician-Gynecologist
Professor in Obstetrics
Gynecology and Reproductive Sciences
San Francisco General Hospital Colposcopy Clinic
TODAY’S PRESENTER (3)

Francisco García, MD, MPH
Obstetrician-Gynecologist
Director of Public Health
Pima County Health Department - Arizona
Today

- Saraiya: Vital Signs and overview of HPV vaccination
- Sawaya: Cervical cancer screening and treatment
- Garcia: What doctors and communities can do to promote cervical cancer prevention
About Vital Signs

- Appears on the first Tuesday of the month as part of the CDC journal *MMWR*.
- Provides the latest data and information on key health indicators.

<table>
<thead>
<tr>
<th>Cancer prevention</th>
<th>Alcohol use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obesity</td>
<td>Cardiovascular health</td>
</tr>
<tr>
<td>Tobacco use</td>
<td>Teen pregnancy</td>
</tr>
<tr>
<td>Motor vehicle passenger safety</td>
<td>Health care-associated infections</td>
</tr>
<tr>
<td>Prescription drug overdose</td>
<td>Food safety</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>Developmental disabilities</td>
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</table>

- For more information about *Vital Signs* and to subscribe, please visit [http://www.cdc.gov/vitalsigns/](http://www.cdc.gov/vitalsigns/).

Mona Saraiya MD, MPH
Associate Director, Office of International Cancer Control
Division of Cancer Prevention and Control

Clinician Outreach and Communication Activity (COCA)
November 20, 2014
Cervical Cancer Is Preventable—
No woman should die of cervical cancer

- More than **4,000** women die of cervical cancer each year.
- As many as **93%** of cervical cancers could be prevented by screening and HPV vaccination.
- In 2012, **8 million** U.S. women ages 21 to 65 have not been screened for cervical cancer in the last 5 years.

Methods

- Behavioral Risk Factor Surveillance System (BRFSS), 2012
  - Percentage of women who had not been screened for cervical cancer in the past 5 years
  - Cervical cancer incidence rates by state, Census region, and U.S. overall
  - Cervical cancer incidence rates by state, Census region, and U.S. overall
Percentage of Women Who Had Not Been Screened for Cervical Cancer in the Past 5 Years, BRFSS 2012

- 11.4% (8 million) women aged 21–65 had not been screened for cervical cancer in the past 5 years.
- 23.1% of women not screened did not have health insurance.
- 25.5% of women not screened did not have a regular health care provider.
- The proportion of inadequately screened women is higher among older women and Asian/Pacific Islanders.

Source: MMWR 2014;63.
Cervical Cancer Death Rates—United States, 2011
Screening, Incidence, and Death by State and Region

- **Screening, 2012**
  - Range of not screened by state: 6.9% to 18.7%.
  - South had the lowest percentage overall not screened (12.3%).

- **Incidence rates, 2007–2011**
  - 62,150 cervical cancer cases.
  - Overall 1.9% per year decrease in the United States.
  - South had the highest incidence rate (8.5 per 100,000).

- **Death rates, 2007–2011**
  - 19,969 cervical cancer deaths.
  - Overall death rate did not change in the United States.
  - South had the highest death rate (2.7 per 100,000).


- Widespread use of the Pap test has resulted in dramatic decreases in cancer deaths.
- Death rates did not change from 2007–2011.

What Can Be Done to Address Cervical Cancer?

Doctors, nurses, and health systems can:

- Help women understand what screening tests are best for them and when they should get screened.
- Screen or refer all women as recommended at any visit.
- Make sure patients get their screening results and the right follow-up care quickly.
- Use reminder-recall systems to help doctors, nurses, and patients remember when screening and HPV vaccination are due.
- Strongly recommend that preteens and teens get vaccinated against HPV.

HPV / HPV Vaccine Basics
Human Papillomaviruses

- **Double-stranded DNA virus**
  - More than 120 closely related viruses
    - Types numbered in order of discovery
- **HPV infection confined to epithelium**
  - Begins in base of epithelium, cells proliferate and are not killed
- **Humoral and cellular immune responses identified**
  - Antibodies detected in less than 70% of females infected
HPV Types Differ in Their Disease Associations

~40 Types

Mucosal/genital sites of infection

Cutaneous sites of infection ~ 80 Types

High-risk (oncogenic)
HPV 16, 18

Low-risk (non-oncogenic)
HPV 6, 11

Cervical cancer
Vaginal, vulvar, penile, anal, oropharyngeal, oral cavity
High-grade precancers -- Low-grade cervical disease

Genital warts
Laryngeal papillomas
Low-grade cervical disease

“Common” hand and foot warts
Genital HPV Infection

- Most common sexually transmitted infection
- ≈14 million new infections in U.S. each year
- Acquired around sexual debut
  - 40% infected within 2 years
- Most sexually active persons infected at some point
- Infection usually transient, asymptomatic
  - 90% clear or become undetectable within 2 years
- Persistent infection with some types can lead to disease
Evolution of Recommendations for HPV Vaccination in the United States

2006
- Quadrivalent Routine, females 11 or 12 years* and 13-26 yrs not previously vaccinated

2007
- Quadrivalent or Bivalent Routine, females 11 or 12 years* and 13–26 years not previously vaccinated

2008
- Quadrivalent Routine, males 11 or 12 years* and 13-21 years not previously vaccinated
- May be given, 22–26 years**

2009
- Quadrivalent Routine, males 11 or 12 years* and 13-21 years not previously vaccinated
- May be given, 22–26 years**

2010
- Quadrivalent (HPV 6,11,16,18) vaccine; Bivalent (HPV 16,18) vaccine
- *Can be given starting at 9 years of age
- **For MSM and immunocompromised males, quadrivalent HPV vaccine through 26 years of age

2011
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ACIP Recommendation for HPV Vaccine

- Routine HPV vaccination recommended for both males and females ages 11–12 years
- Catch-up ages 13–21 years for males; 13–26 for females
- May vaccinate at ages 9–10 years for both males and females; 22–26 for males
HPV Vaccine Recommendation for Females

Either bivalent HPV vaccine (Cervarix) or quadrivalent HPV vaccine (Gardasil) recommended for girls at age 11 or 12 years for prevention of cervical cancer and precancer

- Also for girls 13 through 26 who haven’t started or completed series
- Only quadrivalent HPV vaccine (Gardasil) also for prevention of vaginal, vulvar, and anal cancers, as well as genital warts.
HPV Vaccine Recommendation for Males

- Quadrivalent HPV vaccine (Gardasil) recommended for boys at age 11 or 12 years for prevention of anal cancer and genital warts
  - Also for boys 13 through 21 who haven’t started or completed series
  - Young men, 22 through 26 years of age, who identify as gay or bisexual
  - Young men, 22 through 26 years of age, who are immunocompromised
HPV Vaccination Schedule

- **ACIP recommended schedule is 0, 1–2, 6 months**
  - Following the recommended schedule is preferred

- **Minimum intervals**
  - 4 weeks between doses 1 and 2
  - 12 weeks between doses 2 and 3
  - 24 weeks between doses 1 and 3

- **Administer IM**
HPV Vaccine
Duration of Immunity

- The vaccine appears to have good long-term protection duration after a complete 3-dose schedule
- Available evidence indicates protection for at least 8–10 years
  - Multiple cohort studies are in progress to monitor the duration of immunity
HPV vaccine is cancer prevention.
Talk to your child's doctor about vaccinating your 11-12 year old against HPV.
www.cdc.gov/vaccines/teens

If there were a vaccine against cancer, wouldn't you get it for your kids?

HPV vaccine is cancer prevention.
Talk to the doctor about vaccinating your 11-12 year old sons and daughters against HPV.
www.cdc.gov/vaccines/teens
If there were a vaccine against cancer, wouldn’t you get it for your kids?

HPV vaccine is cancer prevention. Talk to the doctor about vaccinating your 11–12 year old sons and daughters against HPV.

www.cdc.gov/vaccines/teens
Thank You
www.cdc.gov/cancer

For more information, contact:
Mona Saraiya MD, MPH
yzs2@cdc.gov

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E-mail: cdcinfo@cdc.gov Web: http://www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.
Updates on Cervical Cancer Screening

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Professor
Department of Obstetrics, Gynecology and Reproductive Sciences
Department of Epidemiology and Biostatistics
University of California, San Francisco
Director, Cervical Dysplasia Clinic, San Francisco General Hospital
From virus to cancer

Precancerous lesions

Cervical intraepithelial neoplasia (CIN) Graded based on proportion of epithelium involved

• CIN 1: indicates active HPV infection; high spontaneous resolution: treatment discouraged
• CIN 2: most treated, but about 40% resolve over a 6-month period; treatment may be deferred in young women
• CIN 3: proximal cancer precursor
• Adenocarcinoma in situ (rare)
## Treating precancerous lesions: 3 main modalities

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freezing or Laser</td>
<td>Destroying abnormal cervical changes by freezing with a very cold instrument (cryotherapy) or by vaporizing them with a laser beam</td>
</tr>
<tr>
<td>LEEP or Cone biopsy</td>
<td>Removing abnormal cervical changes with a hot wire (LEEP) or with a scalpel (cone biopsy)</td>
</tr>
<tr>
<td>Hysterectomy</td>
<td>Removing the cervix and uterus entirely</td>
</tr>
</tbody>
</table>
# 2012 Cervical Cancer Screening Guidelines for Average-risk Women

US Preventive Services Task Force, American Cancer Society/American Society for Colposcopy and Cervical Pathology/American Society for Clinical Pathologists, American College of Obstetricians and Gynecologists

<table>
<thead>
<tr>
<th>Age to begin screening</th>
<th>21</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening methods and intervals, by age</strong></td>
<td><strong>Ages 21-65: cytology every 3 years or Ages 21-29: cytology every 3 years Ages 30-65: cytology plus HPV testing (for high-risk or oncogenic HPV types) every 5 years</strong></td>
</tr>
<tr>
<td><strong>Age to end screening</strong></td>
<td>65</td>
</tr>
<tr>
<td>If 3 consecutive negative cytology results or 2 consecutive negative cytology plus HPV tests within 10 years before cessation of screening, with the most recent test performed within 5 years</td>
<td></td>
</tr>
<tr>
<td><strong>Screening after hysterectomy with removal of the cervix</strong></td>
<td>Not recommended</td>
</tr>
</tbody>
</table>

Guidelines do not apply to immunocompromised women (HIV+), those with *in utero* DES exposure and those with prior CIN 2 or 3 or cervical cancer. Vaccinated women are screened the same as unvaccinated women.
Ending screening: regardless of age

- ACOG, ACS and USPSTF: all agree that screening following total hysterectomy with removal of the cervix for benign disease is not indicated. USPSTF: “D” recommendation

- ACOG (2003): If hysterectomy for CIN 2 or 3, may stop screening after 3 normal tests.
- ACOG (2012): Continued routine screening (cytology ever 3 years) recommended for 20 years.
Rationale

• Beginning at age 21
cervical cancer precursors and cancers: rare
abnormal tests: common
concerns: false-positive testing, unnecessary invasive procedures, possible preterm delivery risk with excisional procedures

• Screening every 3 years with cytology alone
average time from CIN 3 to cancer: 10 years
concerns with annual testing: false-positive testing, invasive procedures

• Screening every 5 years with cytology plus HPV testing
decision analysis: similar benefits (cancers, cancer deaths prevented) and harms (colposcopies, false-positive tests) as cytology every 3 years
USPSTF: apply only to “women who want to lengthen the screening interval”
ACS: co-testing “preferred” but based on a “weak” recommendation

• Ending screening at age 65
cervical cancer uncommon among well screened older women but potential for harms (false-positive testing, invasive procedures)
On the horizon

Cobas HPV test (14 HR types): FDA approved as a primary screening test beginning at age 25 years

Currently not endorsed by any major guideline group
Community Cervical Cancer Prevention: Missed Opportunities

Francisco A. R. García, MD, MPH
Director & Chief Medical Officer
Distinguished Outreach Professor of Public Health
Faculty Disclosure

• I have no personal financial interests or affiliations to disclose
US-Mexico Border
# Cancer Screening in Border Communities: BRFSS 1999-2000

<table>
<thead>
<tr>
<th></th>
<th>Never Pap Hispanic</th>
<th>Never Pap Non-Hispanic</th>
<th>Pap &gt;3 years Hispanic</th>
<th>Pap &gt;3 years Non-Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Border Counties</td>
<td>14.9%</td>
<td>3.8%</td>
<td>26.4%</td>
<td>11.7%</td>
</tr>
<tr>
<td>Non-Border Counties</td>
<td>8.7%</td>
<td>5.4%</td>
<td>16.7%</td>
<td>15.4%</td>
</tr>
<tr>
<td>US</td>
<td>8.7%</td>
<td>5.3%</td>
<td>15.9%</td>
<td>15.0%</td>
</tr>
</tbody>
</table>

Factors Positively Associated with Pap <3 years: Younger age, non-Hispanic ethnicity, lower parity, non-rural residence, physician visit past year & insurance.

S. Coughlin. Fam Community Health 2003
Comprehensive Cervical Cancer Prevention in Vulnerable Communities

Vaccination → Screening → Diagnosis

Survivorship ← Surveillance ← Treatment
Missed Opportunity: Coverage & Access
8m Un/Under Screened women (21-65 years)

<table>
<thead>
<tr>
<th>Percent Estimate</th>
<th>n</th>
<th>Insured</th>
<th>Health Care Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>70%</td>
<td>5.6m</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>10%</td>
<td>0.8m</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>10%</td>
<td>0.8m</td>
<td>-</td>
<td>+</td>
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<td>0.8m</td>
<td>+</td>
<td>-</td>
</tr>
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</table>

Benard V et al. MMWR 2014
Cervical Cancer Screening Utilization: Yuma Project

• Cross-sectional population based study (n=504)
• Post menopausal (≥50) women in Yuma County
• Mexican-born, US-born Hisp, White/Non-Hisp
• Cancer screening & utilization

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Mex Born Hispanic</th>
<th>US Born Hispanic</th>
<th>White Non-Hisp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pap w/in 3 years</td>
<td>73%</td>
<td>75%</td>
<td>64%</td>
<td>72%</td>
</tr>
</tbody>
</table>

Nuno, Castle & Garcia J Women’s Health 2011
### Missed Opportunity: Tapping into Existing Social Networks

**Yuma Promotora Intervention, 3-year follow-up**

<table>
<thead>
<tr>
<th>Pap</th>
<th>n (%)</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usual Care</td>
<td>87 (75%)</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>(n=116)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td>93 (89%)</td>
<td>2.8</td>
<td>(1.3-6.0)</td>
</tr>
<tr>
<td>(n=104)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p=0.007

Nuno, Martinez & Garcia, Cancer Causes Control 2012
Missed Opportunity: Post Screening Loss to Follow-up

California (Tabnak. CCC 2010)
- 12.3% lost post screening
- 8% lost post colp diagnosis

Quebec (Franco. Prev Med 2007)
- 12% loss post screening

Pima County (Garcia)
- 15% loss post screening
Missed Opportunity: Timely Treatment

Cumulative percent of women receiving LEEP after a diagnosis of CIN2+
By year of diagnosis (unpublished Wheeler et al. 2010)

Note: The diagnosis of CIN2+ is from a cervical biopsy that is at least one year after any previous biopsy. Population ~275,000 women screened/yr. Approximately 82% of women had a referral Pap smear ascertained by the NM HPV Pap Registry. The intercept on the vertical axis indicates that about 7% had a LEEP at the same time that the diagnosis of CIN2+ was made.
Most clinicians wait too long to make strong recommendations for HPV vaccine

11-12 y.o. females
- 51% Strongly recommend
- 36% Recommend, but not strongly
- 8% Recommend against
- 8% Make no recommendation

13-15 y.o. females
- 79% Strongly recommend
- 15% Recommend, but not strongly
- 10% Recommend against
- 6% Make no recommendation

16-18 y.o. females
- 85% Strongly recommend
- 10% Recommend, but not strongly
- 10% Recommend against
- 5% Make no recommendation

Clinicians underestimate the value parents place on HPV vaccine

Missed Opportunity: Reminder/Recall Impact on Vaccination

Missed Opportunity: Optimizing Vaccination Visits

Impact of Eliminating Missed Opportunities by Age 13 Years in Girls Born in 2000

Missed opportunity: Healthcare encounter when some, but not all ACIP-recommended vaccines are given.
HPV-1: Receipt of at least one dose of HPV.

MMWR. 63(29):620-624.
Relative Role of Host and Contextual Factors

Contextual Factors
- Availability of services
- Immigration status
- Systemic obstacles
- Cultural/linguistic
- Insurance status
- Educational
- Geographic

HPV Persistence Type

Vulnerable Population

HPV Persistence Type

Resilient Population
Minimize missed opportunities!

- Know your community
- Tap into existing resources
- Every clinical encounter is an opportunity to review screening/vaccination history
- Provide effective follow-up
- Optimize insurance coverage
How to Ask a Question

- **Using the Webinar System**
  - Click the Q&A tab at the top left of the webinar toolbar.
  - Click in the white space.
  - Type your question.
  - Click Ask.

- **On the Phone**
  - Press star (*) 1 to enter the queue to ask a question.
  - State your name.
  - Listen for the operator to call your name.
  - State your organization and ask your question.
Thank you for joining!
Please send questions to coca@cdc.gov

Centers for Disease Control and Prevention
Atlanta, Georgia

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