

HPV and Cervical Cancer: An Update on Prevention Strategies

www.phppo.cdc.gov/PHTN/HPV-05

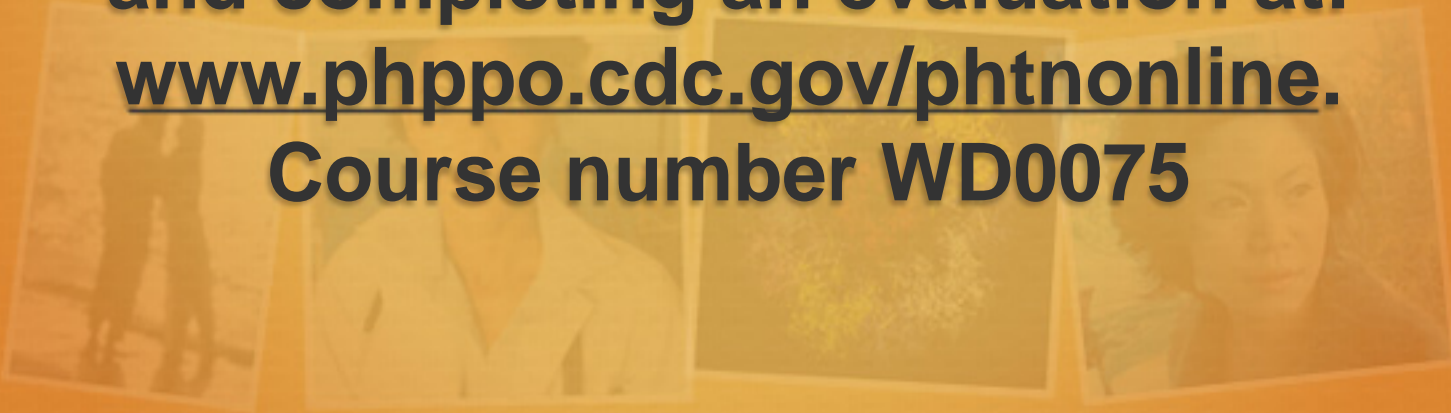


HPV and Cervical Cancer: An Update on Prevention Strategies

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Course number WD0075



HPV and Cervical Cancer: An Update on Prevention Strategies

Continuing Education Assistance

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404-639-1292**

E-mail: CE@cdc.gov



Objectives

- **Identify high-risk and low-risk types of genital HPV infection**
- **Discuss the epidemiology of genital HPV infection in the United States**

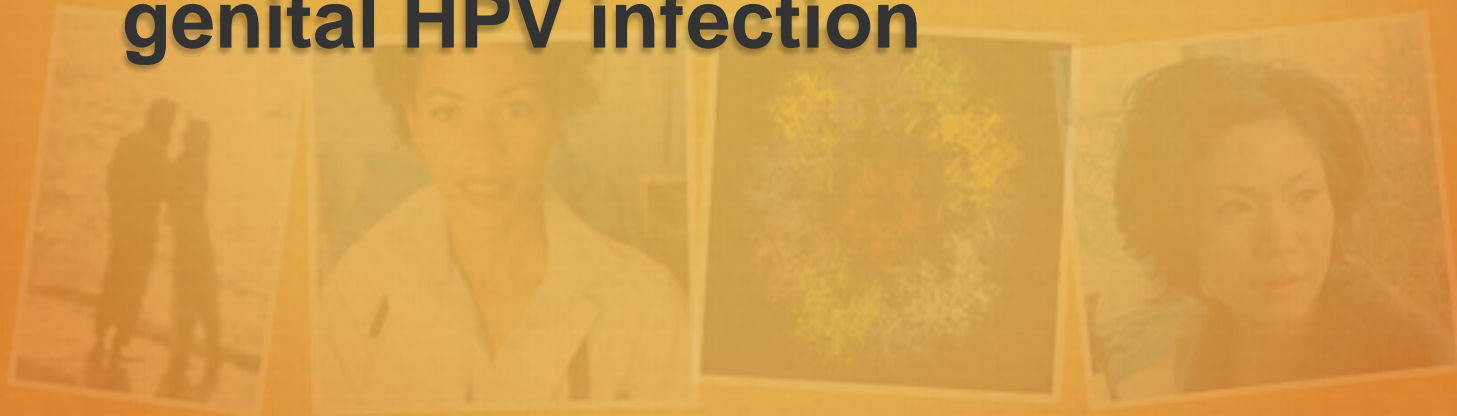


Objectives

- Describe the natural history of genital HPV infection
- Identify methods used to detect cervical cellular abnormalities for the prevention of cervical cancer
- Describe the clinical uses of HPV DNA tests in the context of Pap test screening and management

Objectives

- **Summarize appropriate patient counseling messages for genital HPV infection**
- **Identify methods for preventing genital HPV infection**



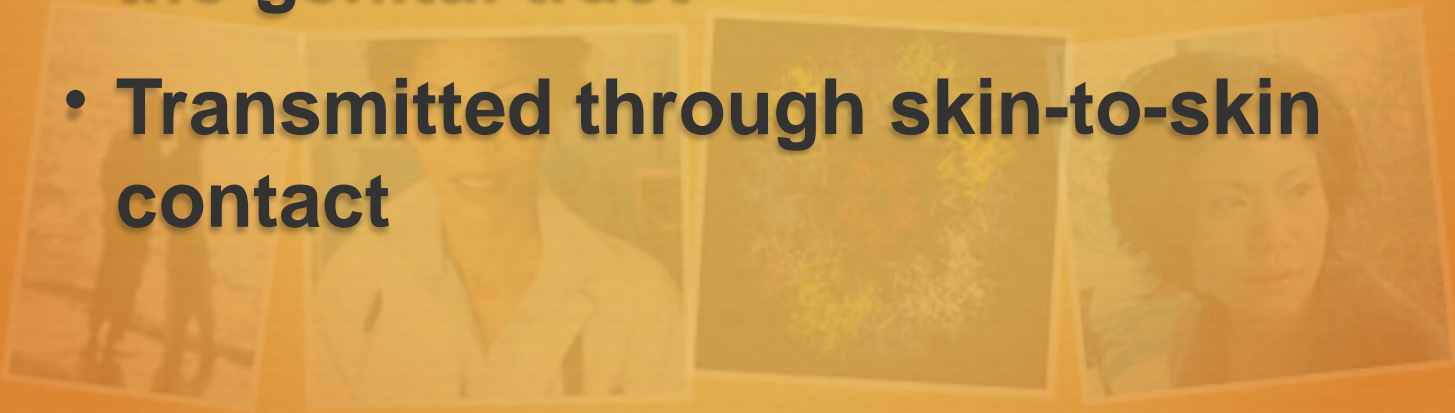
Papillomaviruses are a complex group of DNA tumor viruses, found in many species, where they can cause benign growths, or papillomas, and cancers.



They can't be routinely grown in the lab. This makes it hard to test experimental treatment. Papilloma-viruses are most commonly detected by the presence of DNA.



- **HPV types are distinguished by genetic sequences, hence genotypes**
- **More than 30 genotypes of HPV are sexually transmitted and can infect the genital tract**
- **Transmitted through skin-to-skin contact**



Clinical Manifestations

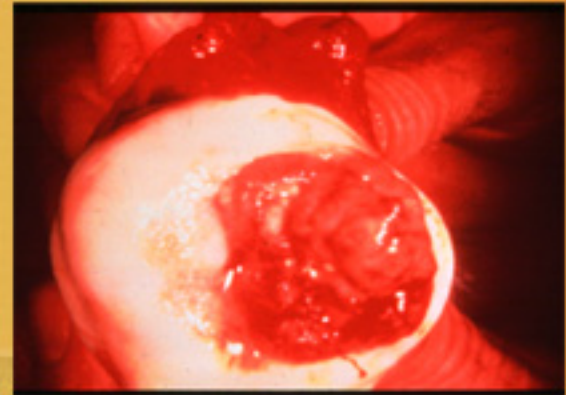
Penile Warts



Perianal Warts



Cervical Cancer



Source: Seattle STD/HIV Prevention Training Center at the University of Washington/ UW HSCER Slide Bank

Source: Cincinnati STD/HIV Prevention Training Center

Low-Risk HPV Types

**6, 11, 40, 42, 43, 44,
54, 61, 72, 73, and 81**



High-Risk HPV Types

**16, 18, 31, 33, 35, 39, 45,
51, 52, 56, 58, 59, 68, and 82**



Infection with either low-risk or high-risk types of genital HPV usually causes no clinical signs or symptoms and are transient.



HPV Risk Factors for Acquisition

- **Persons 25 years or younger**
- **First intercourse at 16 years or younger**



HPV Risk Factors for Acquisition

- **Persons 25 years or younger**
- **First intercourse at 16 years or younger**
- **Increased number of sex partners**
- **Having sex partners who've had multiple partners**



Genital HPV Infected

- 20 million people
- 9.2 million sexually active people between 15-24 years
- 6.2 million new infections each year

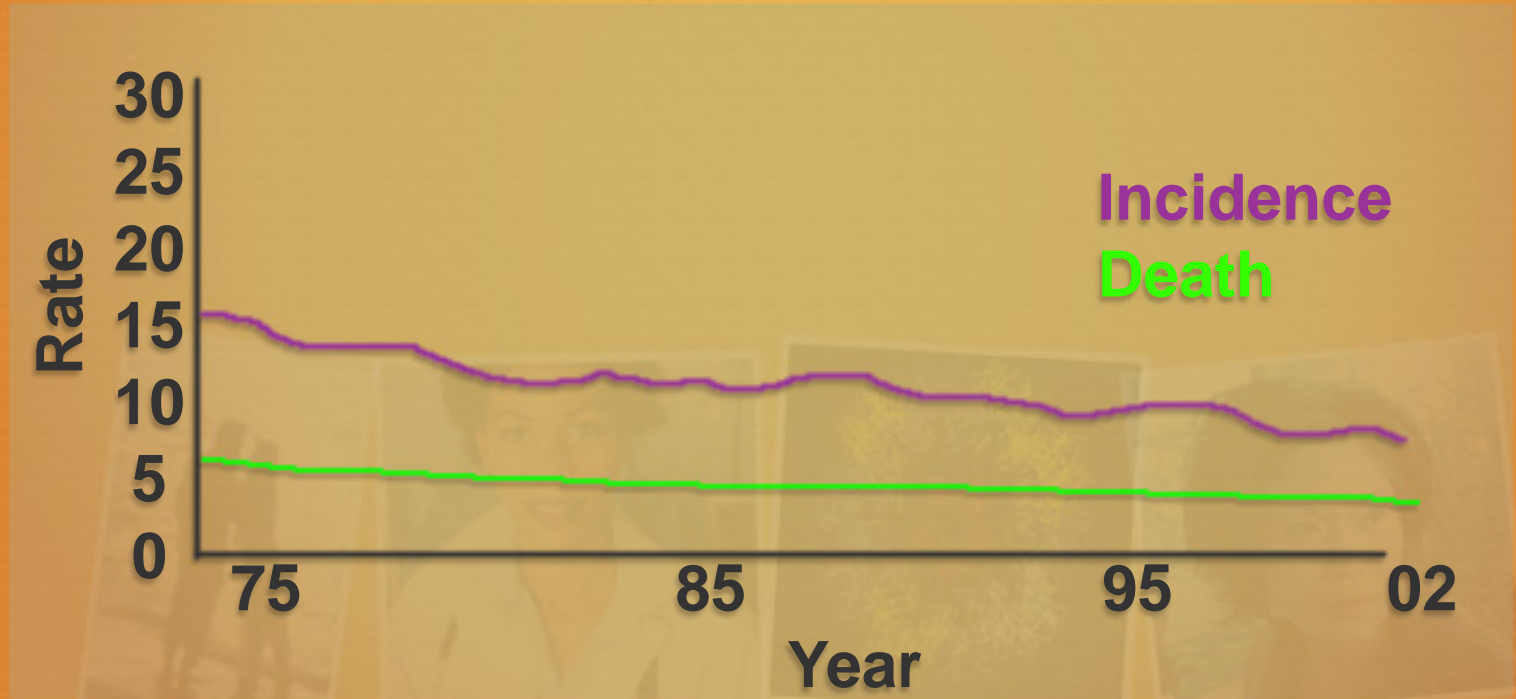


Risk Factors for Developing Cervical Cancer

- Rarely or never being screened
- Cigarette smoking
- Long-term use of oral contraceptives
- Having a high number of live births
- Co-infection with *Chlamydia trachomatis* or herpes simplex virus type 2

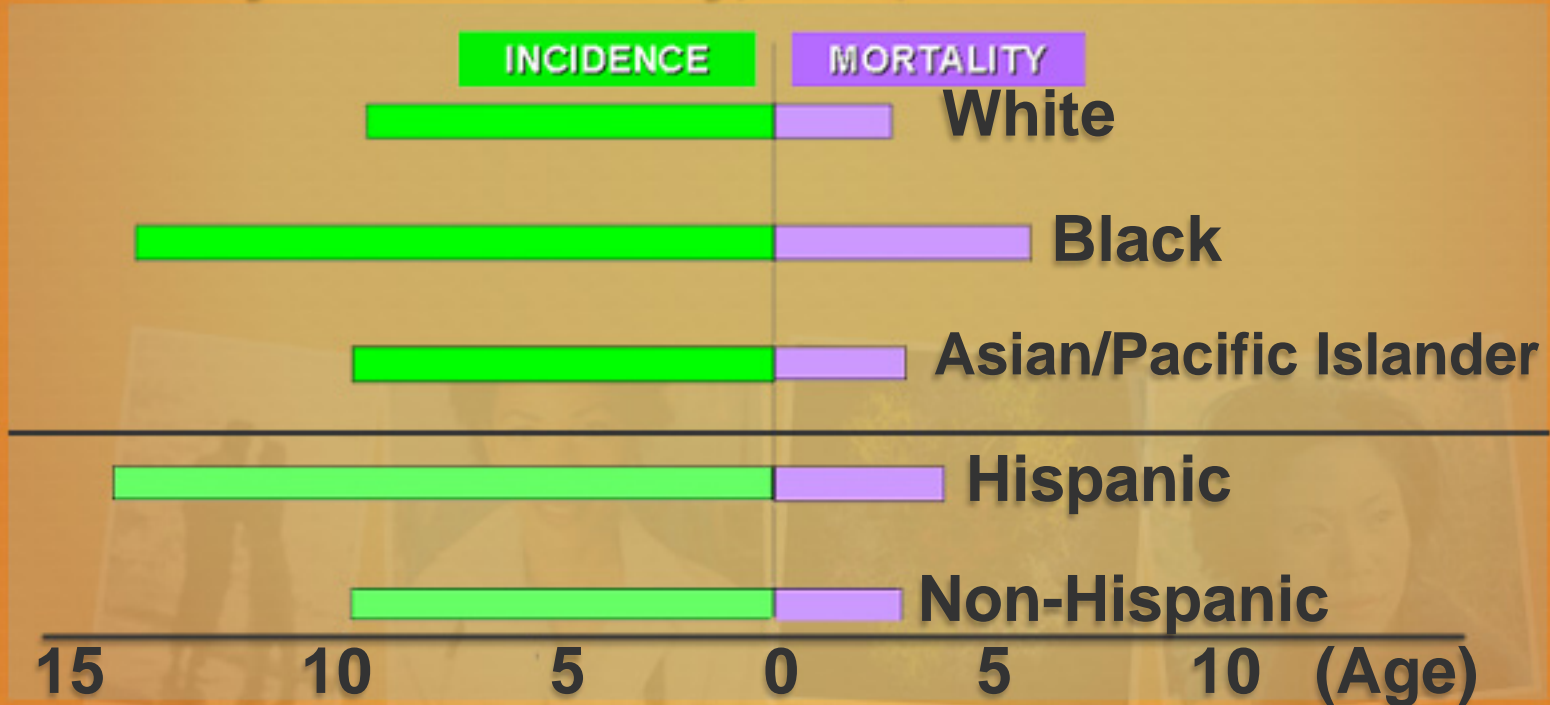
SEER Invasive Cervical Cancer Incidence and Mortality Rates

U.S., 1975-2002



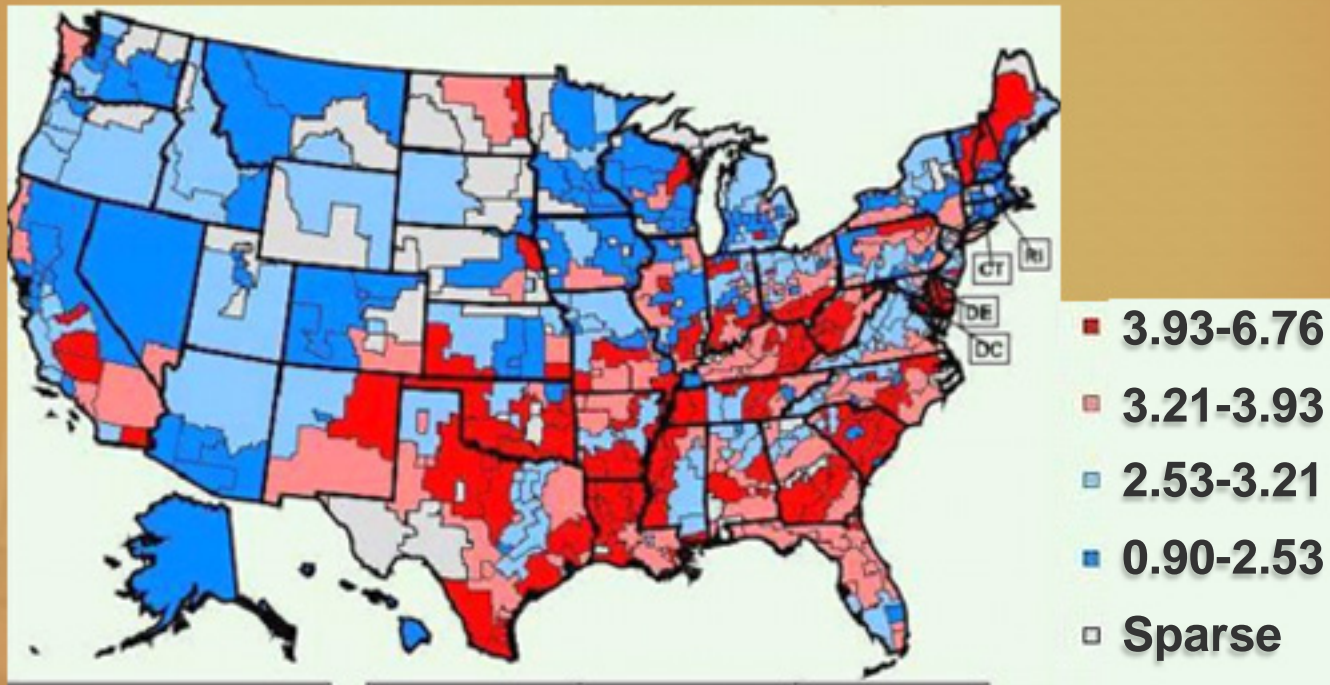
Invasive Cervical Cancer Incidence and Mortality Rates

By Race/Ethnicity, U.S., 1998-2001

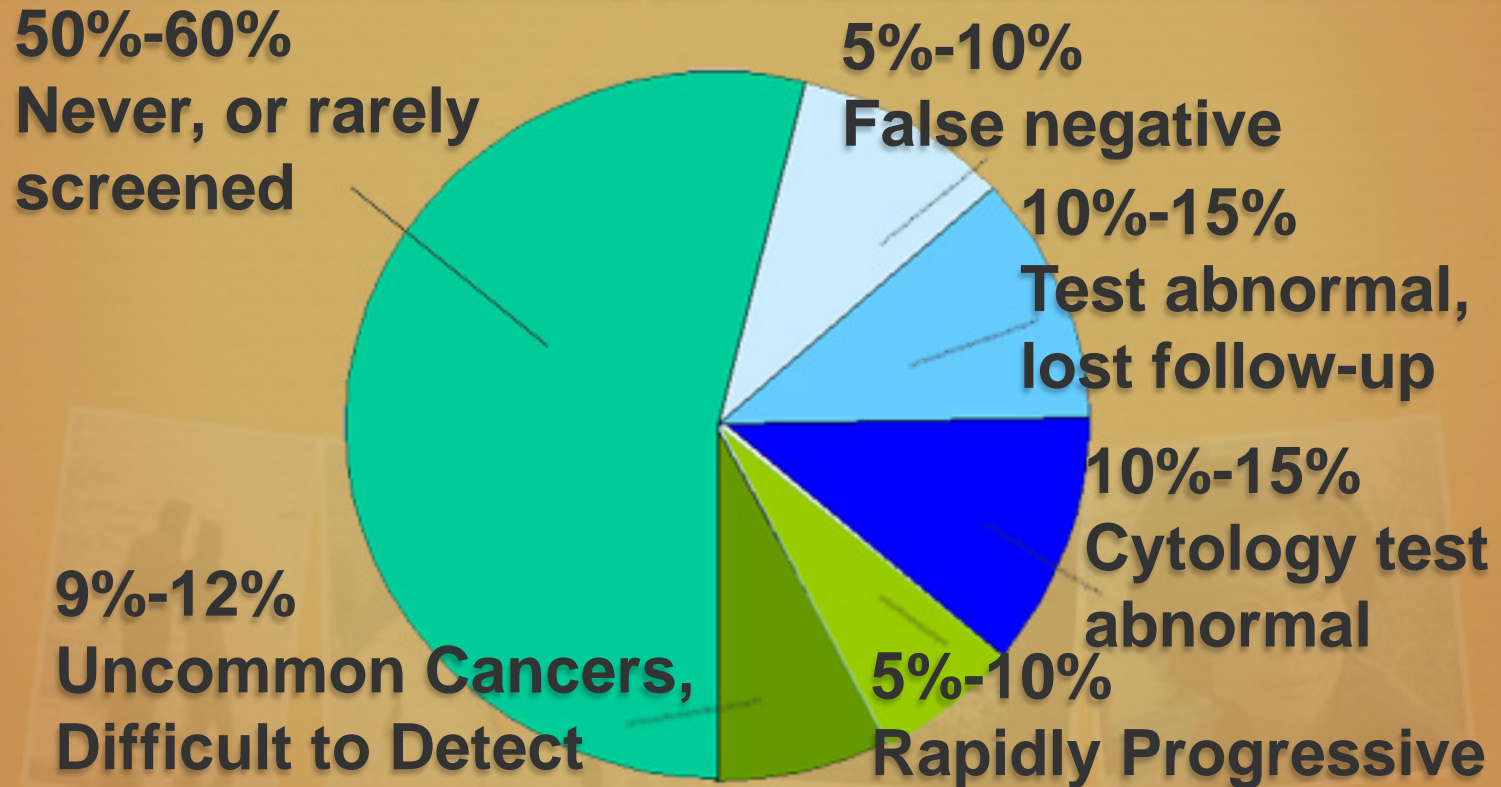


Age-adjusted Cervical Cancer Mortality Rates

By State Economic Area, 1995-1999



Factors Contributing to Cervical Cancer

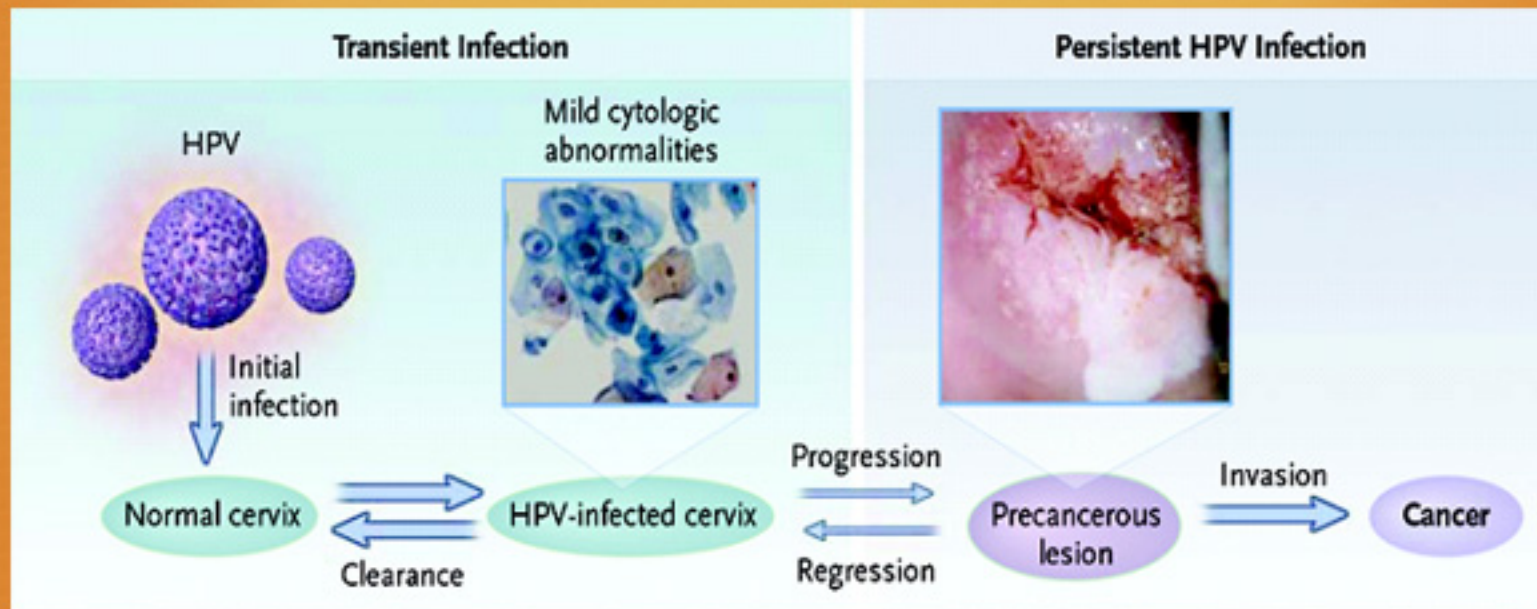


Prevalence of Cervical Cancer Screening

National Health Survey, U.S. 2000

Group	% Pap test past 3 years
All women	82%
Insured	
yes	85.8
no	62%
Country of birth	
Foreign born in U.S. <10 yrs	61%
US born	83.4
Race/Ethnicity	
Hispanic	77%
Non-Hispanic White	83%
Non-Hispanic Black	84%
Asian	71%

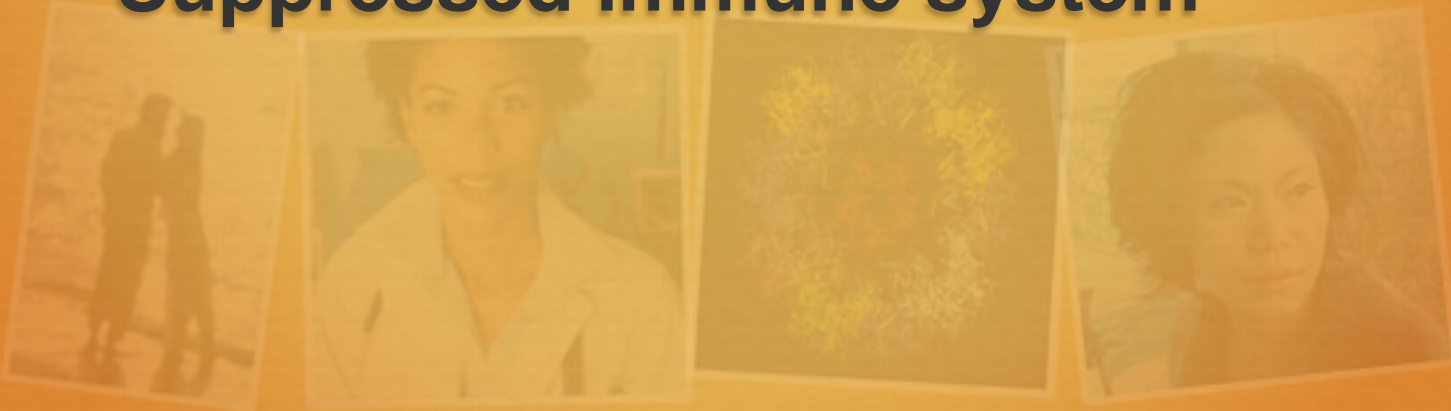
Natural History of HPV Infections



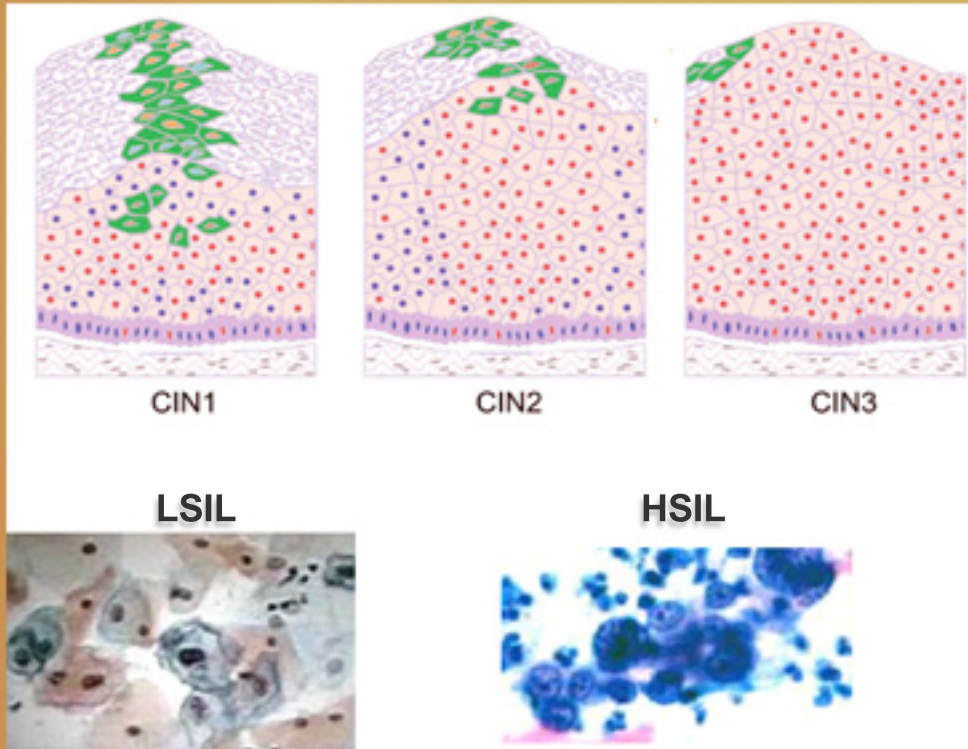
Wright and Schiffman (2003) NEJM

HPV Risk Factors for Persistence

- **30 years and older**
- **High-risk HPV types**
- **Suppressed immune system**



Cervical Intraepithelial Neoplasia



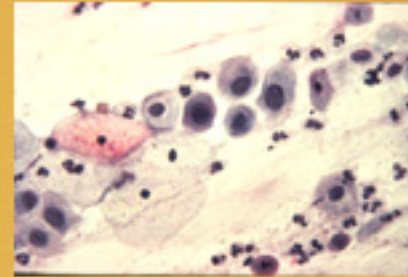
Histology

Cytology

Cervical Cancer Screening Methods

Conventional Cytology

- cells scraped from the cervix, placed on slide and examined in the lab



Sensitivity: 51-88%

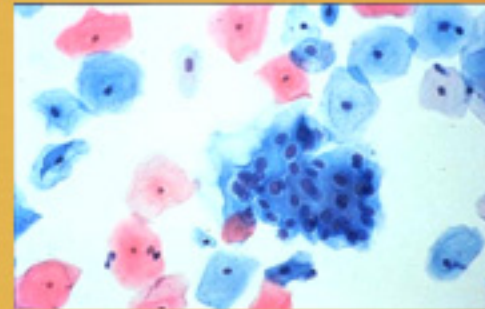
Specificity: 95-98%



Cervical Cancer Screening Methods

Liquid-based Cytology

- cells suspended in liquid
- applied to slide in lab as thin cellular layer
- most blood, mucus, inflammatory cells eliminated



Sensitivity: 61-95%
Specificity: 78-82%

Estimated Annual Abnormal Paps

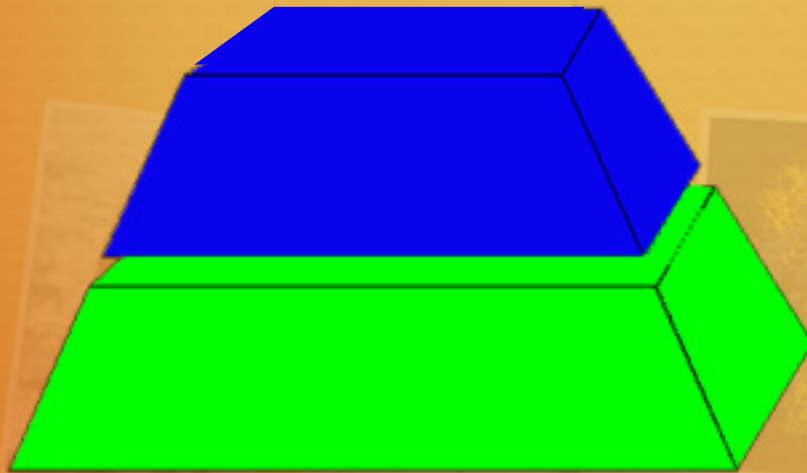
U.S., 2005



ASC-US
2,000,000

Estimated Annual Abnormal Paps

U.S., 2005



LSIL

1,000,000

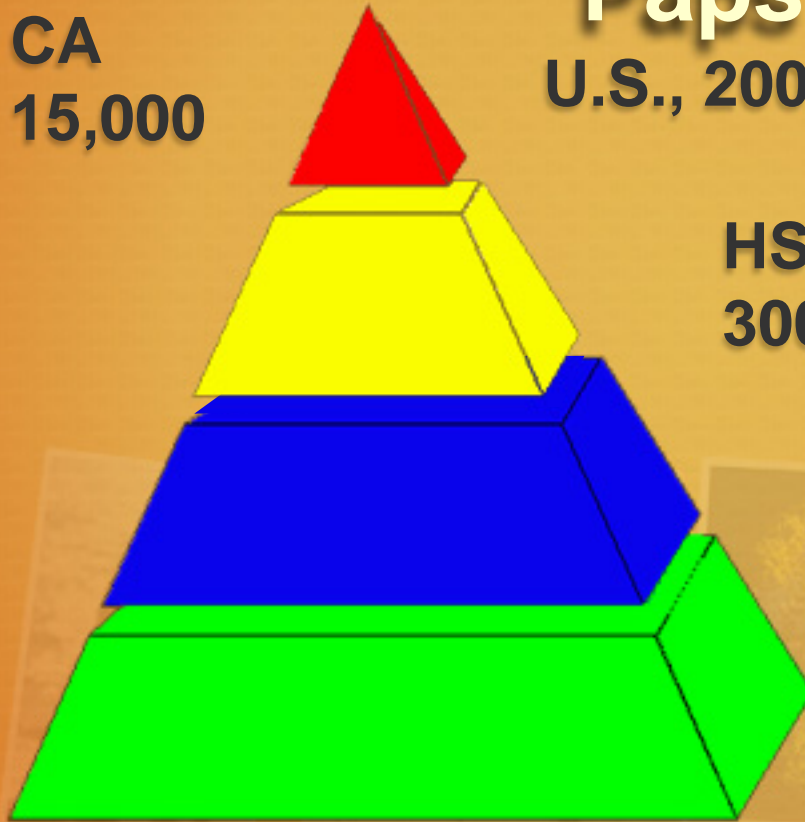
ASC-US

2,000,000

Estimated Annual Abnormal Paps

CA
15,000

U.S., 2005



HSIL
300,000

LSIL
1,000,000

ASC-US
2,000,000

Cervical Cancer Screening Recommendations

	USPSTF 2003	ACS 2002	ACOG 2003
Age to start	Age 21 or within 3 yrs of sexual activity	Age 21 or within 3 yrs of sexual activity	Age 21 or within 3 yrs of sexual activity
Interval			
<30 yr	Conv: at least every 3 yrs	Conv: 1 yr LBC: 2 yr	1 yr
≥ 30 yr		2-3 yrs	2-3 yrs
When to Stop	Age 65	Age 70	No specific age

USPSTF – U.S. Preventive Services Task Force

ACS – American Cancer Society

ACOG – American College of Obstetricians and Gynecologists

Conv – Conventional Cervical Cytology LBC – Liquid-based Cytology

FDA Approved Use of HPV Test

- **Triage**

**Solution hybridization test for
ASC-US test results**

- **Primary Screening**

**Solution hybridization test as adjunct to Pap
test in women 30 years of age and older. If
both tests are negative, next cervical cancer
screening should not occur for at least 3 years.**

Organization Recommendations for HPV DNA Use in Cervical Cancer Screening

	USPSTF	ACS	ACOG	ASCCP
ASC-US triage	Insufficient Evidence	Not addressed	Recommended	Recommended
Primary screening	Insufficient Evidence	Option	Recommended	Recommended

USPSTF – U.S. Preventive Services Task Force ACS – American Cancer Society
ACOG – American College of Obstetricians and Gynecologists
ASCCP – American Society of Colposcopy and Cytopathology

HPV DNA as an Adjunct to Cytology

Results of HPV and Cytology

Both
Negative

HPV (+)
Pap WNL

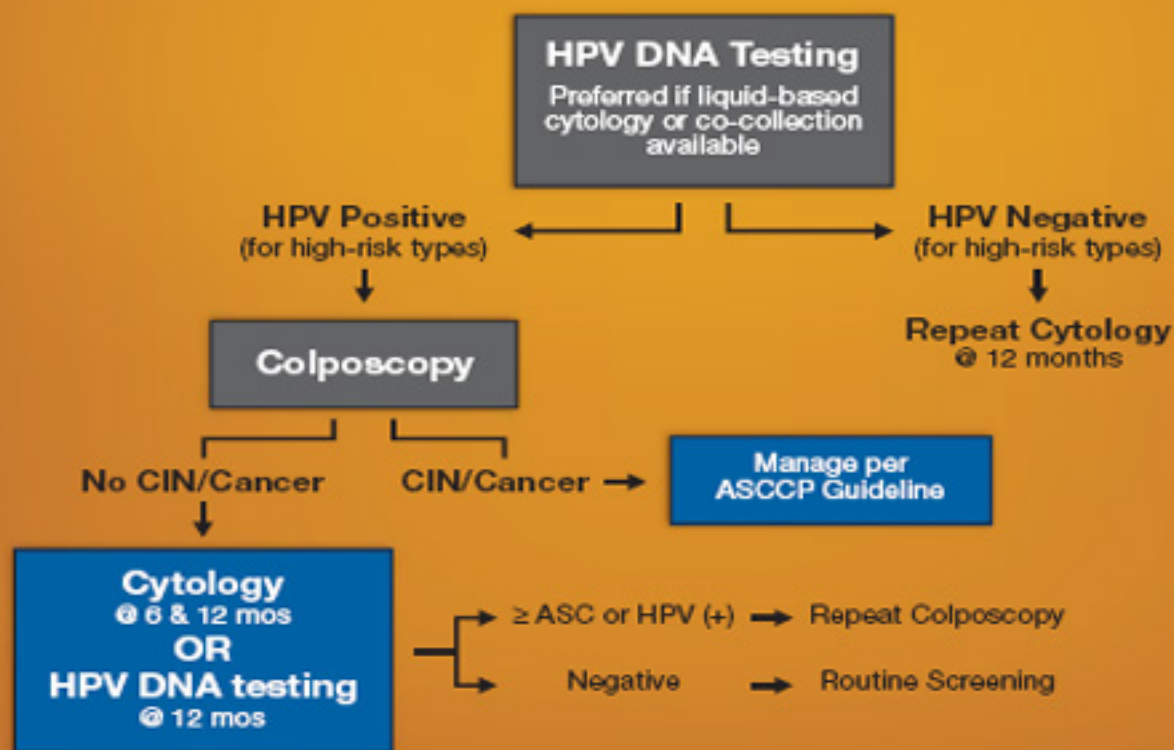
Pap
> LSIL

Repeat Pap in 3 yrs &
HPV in 6 to 12 months

Colposcopy

Wright et al. Obst. Gynecol. 2004 103:304

Management of Women with Atypical Squamous Cells of Undetermined Significance (ASC-US)



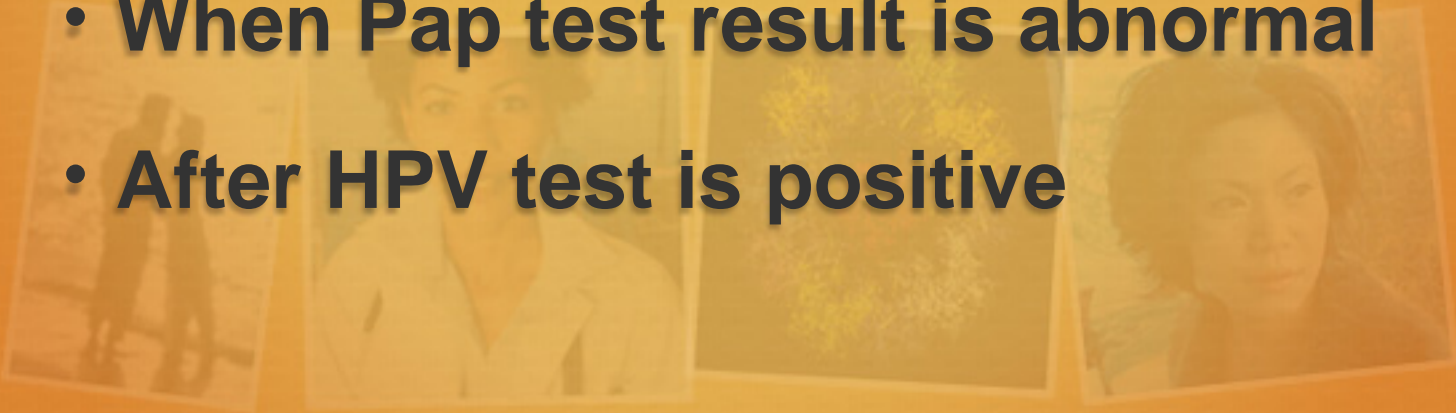
Patient Management

- Repeat Pap twice at 4-6 month intervals
- Immediate colposcopy
- Test for high-risk HPV



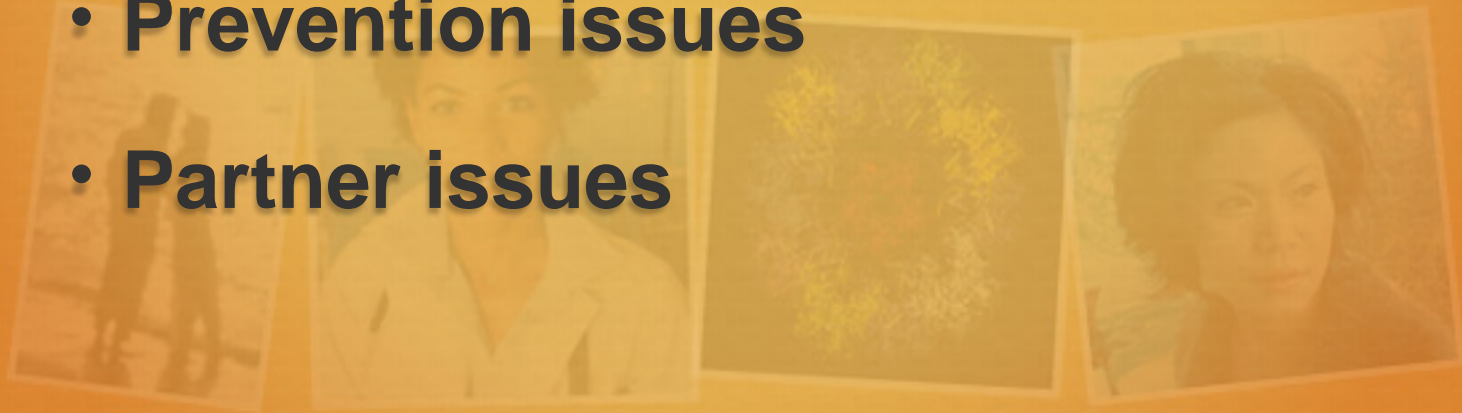
Patient Counseling Should Occur:

- **When genital warts are diagnosed**
- **After Pap screening visits**
- **When Pap test result is abnormal**
- **After HPV test is positive**



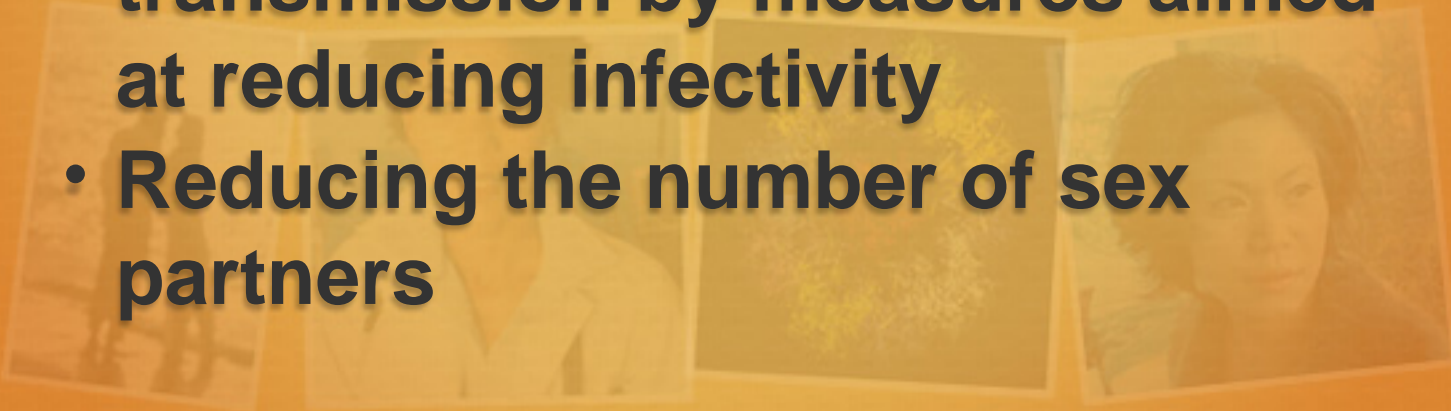
Patient Information

- **General information**
- **HPV transmission**
- **Prevention issues**
- **Partner issues**



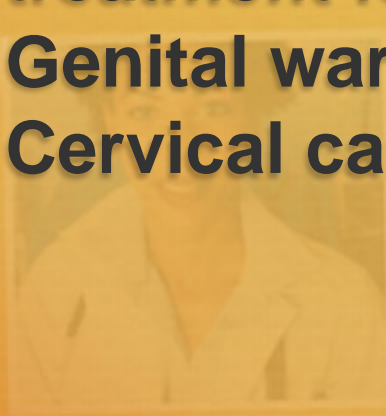
Strategies to Prevent Transmission

- Reducing the duration of infectiousness by treatment
- Decreasing the efficiency of transmission by measures aimed at reducing infectivity
- Reducing the number of sex partners



Strategies to Prevent Transmission

- **Reducing the duration of infectiousness by treatment**
 - **No effective systemic treatment for genital HPV**
 - **Genital warts**
 - **Cervical cancer**

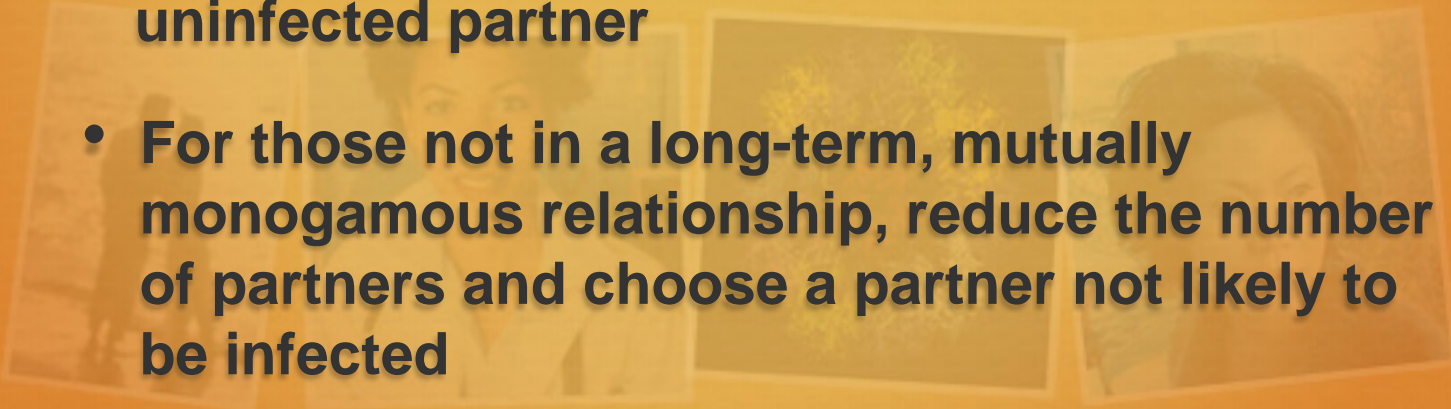


Strategies to Prevent Transmission

- **Decreasing the efficiency of transmission by measures aimed at reducing infectivity**
 - **Physical barriers such as condoms**
 - **Latex condoms can't offer complete protection because**
 - **Genital HPV infections transmitted through skin-to-skin**
 - **Infections can occur in male and female genital areas not covered**
 - **Inadequate existing science on effectiveness of condoms**

Strategies to Prevent Transmission

- Reducing the number of sex partners
 - Abstinence
 - Long-term mutual monogamy with a single uninfected partner
 - For those not in a long-term, mutually monogamous relationship, reduce the number of partners and choose a partner not likely to be infected



Trial Results

HPV type 16 VLP vaccine was highly protective in preventing HPV 16 infection and HPV 16 related cervical intraepithelial neoplasias.



Trial Results

HPV 16-18 vaccine was also highly effective in preventing persistent infections and abnormal Pap smears caused by both types.



SEER Invasive Cervical Cancer Incidence and Mortality Rates

Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.

Source: SEER Cancer Statistics Review, 1975-2002

Invasive Cervical Cancer Incidence and Mortality Rates by Race/Ethnicity

Source: Saraiya M., et al., IPV Conference, 2005.

Incidence rates cover 77%, and mortality rates cover 100% of the U.S. population. Hispanic is not mutually exclusive from white, black, and Asian/Pacific Islander.

Age-adjusted Cervical Cancer Mortality Rates by State
Economic Areas

Source: Grauman D., NCI; <http://www3.cancer.gov/atlasplus/>
State Economic Area: One or more socio-economically
similar counties within a state

Prevalence of Cervical Cancer Screening, National Health
Interview Survey

Swan J, Breen N, Coates RJ, Rimer BK, Lee NC. Progress in
cancer screening practices in the United States: results from
the 2000 National Health Interview Survey. *Cancer*.
2003;97:1528-40.

ASCCP website: <http://www.asccp.org>

Factors Contributing to Cervical Cancer

Sources: NIH Consensus Conference, Janerich, Connecticut
Sung, California

Cervical Intraepithelial Neoplasia

Adapted from Middleton et al. J Virol 77:10186, 2003

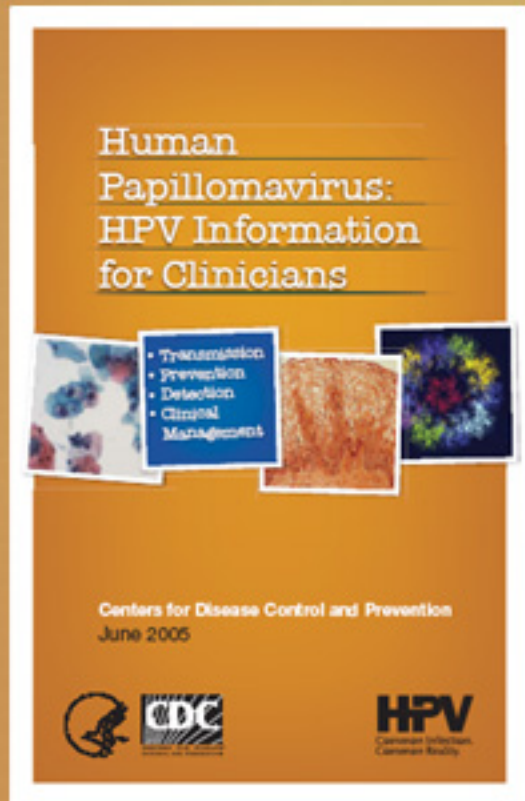
Cervical Cancer Screening Methods

Source: Meyers et al., 2000; Nanda, et al., 2000; Belinson, et al.,
2001

Estimated Annual Abnormal Paps

Modified from Hildesheim, A., National Cancer Institute, 2005

For More Information



[www.cdc.gov/std/
healthcomm/hc-hpv.htm](http://www.cdc.gov/std/healthcomm/hc-hpv.htm)

Produced By

**Centers for Disease Control
and Prevention**

**Department of Health
and Human Services**



Good Day from Atlanta

