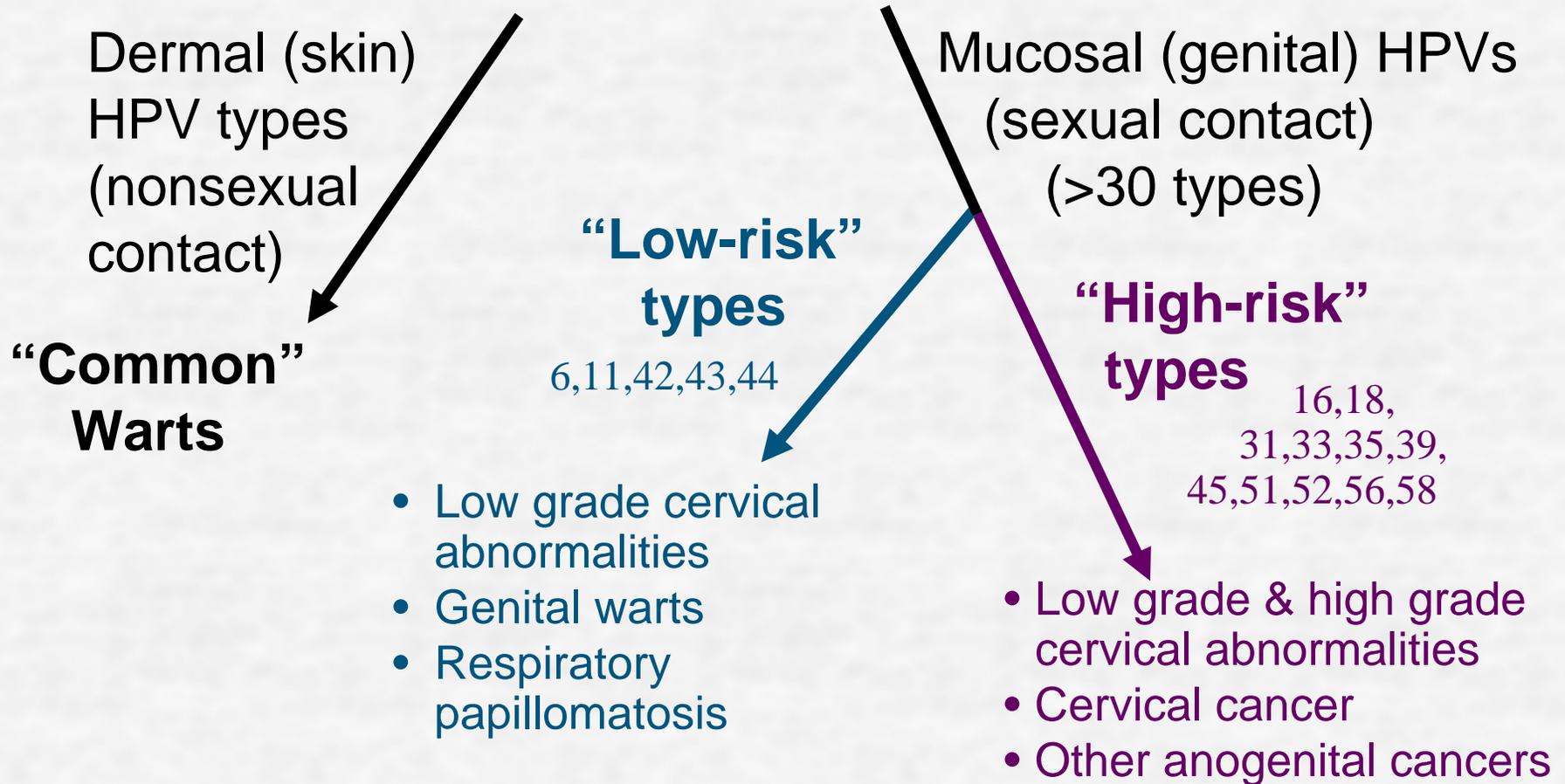


# Human Papillomavirus

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STD Control Branch



# Over 100 HPV Types



Munoz, NEJM 2003;348:518-27.



# Genital HPV Infection Estimates for the U.S.

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- 20 million people currently infected
- 6.2 million new infections annually
- Up to 80% of sexually active people will acquire HPV at some point in their lives
- Vast majority asymptomatic
- No cure -- treatment directed at clinical disease (warts, abnormal Paps)

Cates, STD 1999; Weinstock, Perspect Sexual Repro Health 2004; Koutsky, Am J Med 1997.

*California HPV Vaccine Summit*



# What happens once people get infected with HPV?

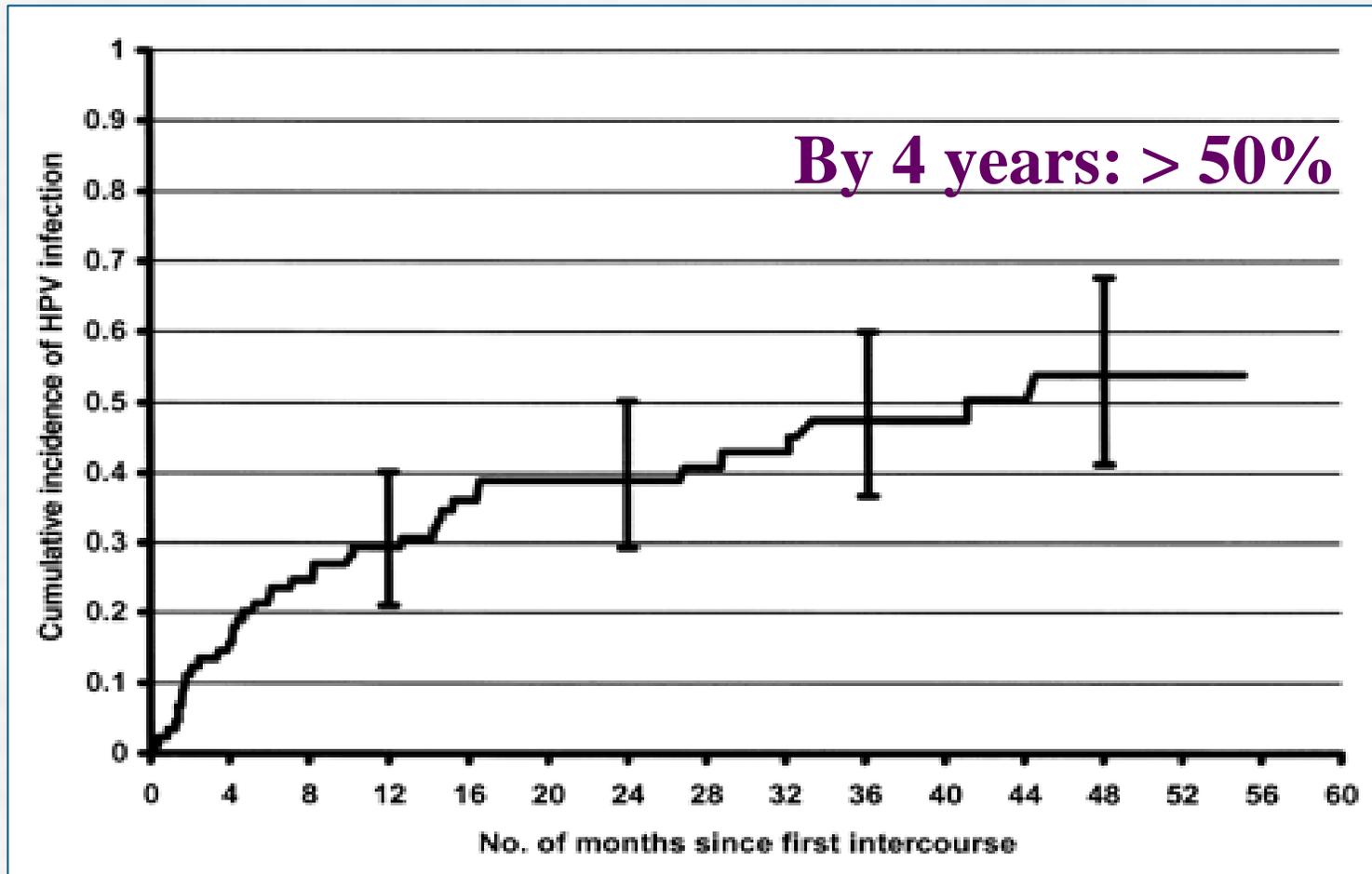
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- For most people, nothing will happen
  - The body's immune system usually eliminates HPV infection
  - Cervical HPV becomes undetectable within 2 years in 90% of young women
  - Relatively few will develop symptoms
- Persistent infection with high-risk HPV types is associated with the development of abnormal Paps and cervical cancer

Ho, NEJM 1998; Moscicki, J Pediatr 1998; Franco, JID 1999; Molano, Am J Epidemiol 2003.



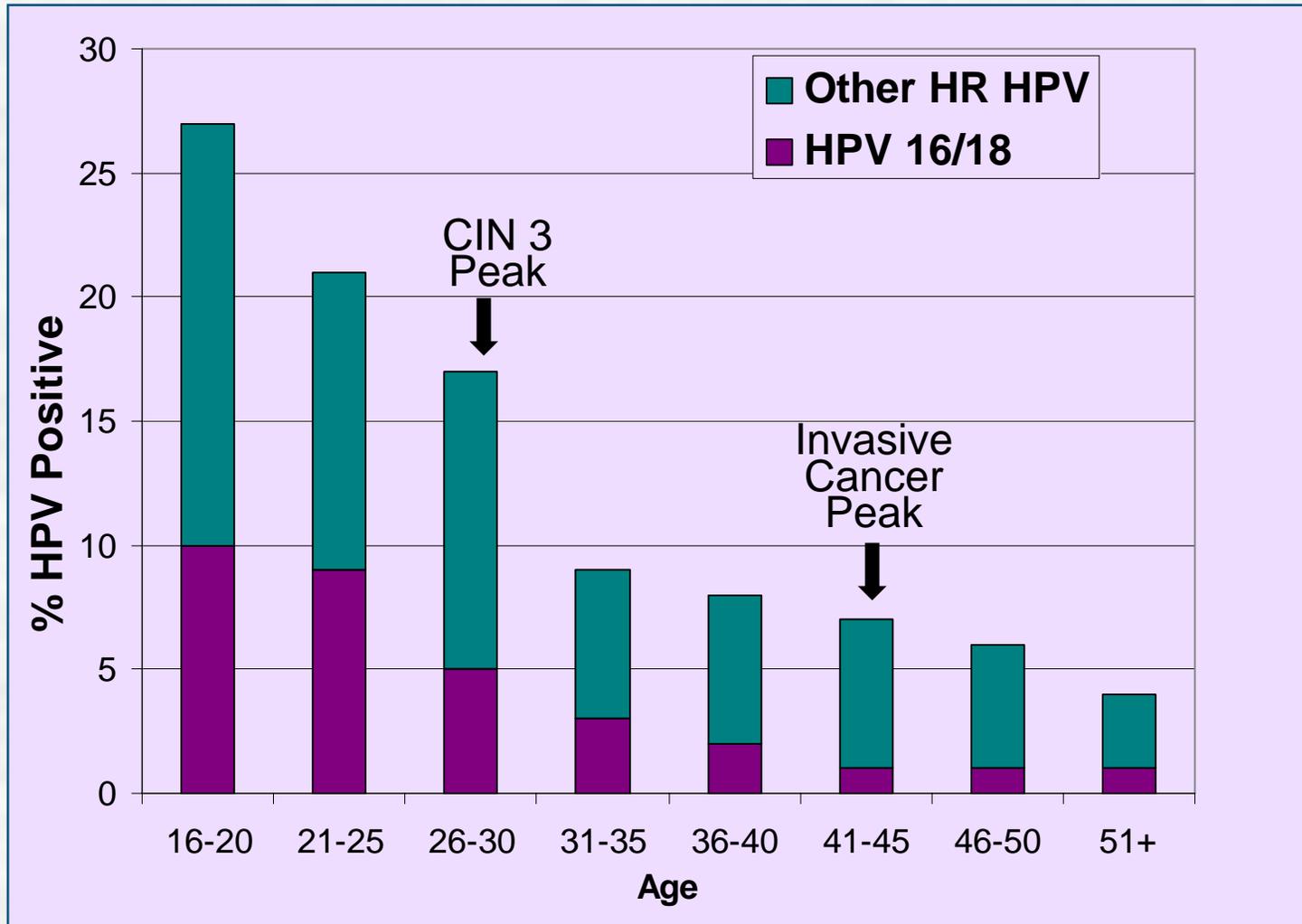
# Incident HPV Infection in Women, Months after Sexual Initiation



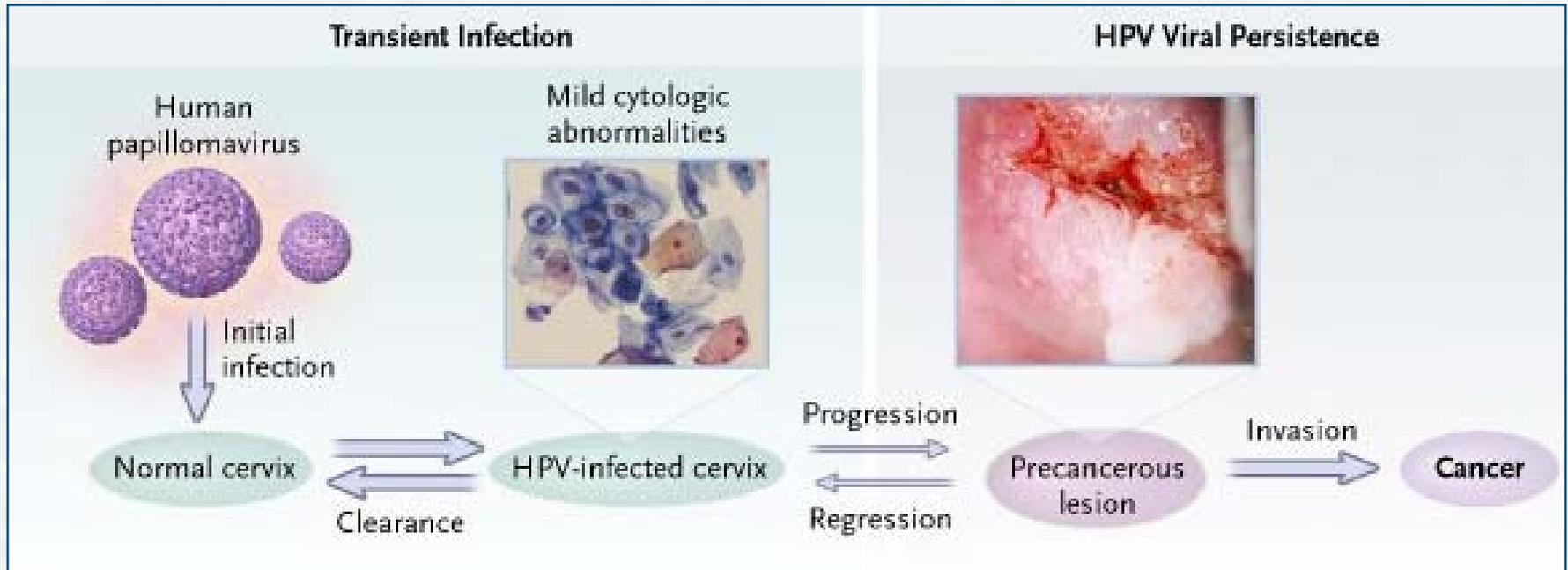
Winer, Am J Epidemiol, 2003.



# Prevalence of High Risk HPV Infection in Women by Age



# Stages of Cancer Progression



Wright & Schiffman, NEJM 2003.



# HPV-Associated Conditions

## HPV 16, 18

## Estimated Attributable %

Cervical cancer	70%
High grade cervical abnormalities	50%
Low grade cervical abnormalities	30%
Anal cancer	~70%
Vulvar/vaginal/penile cancer	~40%
Head and neck cancers	~10%

## HPV 6, 11

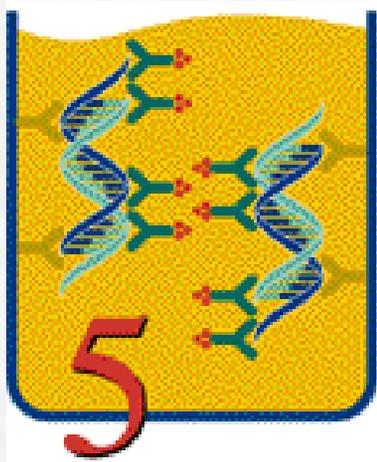
Low grade cervical abnormalities	10%
Genital warts	90%
Recurrent respiratory papillomatosis	90%

Clifford, BrJ Ca 2003, Munoz, Int J Cancer 2004; Brown, J Clin Micro 1993; Carter, Cancer Res 2001; Clifford, Cancer Epi Biomarkers Prev 2005; Gissman, Proc Natl Acad Science 1983; Kreimer, Cancer Epidemiol Biomarkers Prev. 2005.



# Is there a test for high risk HPV?

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## Hybrid Capture HPV DNA Test

RNA probe cocktail to the most common high risk HPV types:

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

### Limited uses include:

- Management of certain abnormal Pap findings
- Adjunct screening in women age 30 and over



# Do condoms prevent HPV?

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- Effectiveness of condoms to prevent HPV infection has not been well-studied
- Some evidence for increased viral clearance and disease regression with condom use
- Recent trial data showing consistent condom use reduces HPV incidence in women by up to 70%
- HPV transmission can occur in genital areas not covered by condoms
- Studies in males are ongoing

Holmes, Bulletin WHO 2004; Winer, ISSTD 2005.



# Summary

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- ❖ Of the >100 HPV types, >30 infect the genital tract
- ❖ HPV is one of the most common STIs
- ❖ Most HPV infections resolve without treatment
- ❖ Persistent infection increases risk of cancer
- ❖ High risk types cause abnormal Paps, cervical cancer, and other anogenital cancers
- ❖ HPV types 16 & 18 cause ~70% of cervical cancer
- ❖ HPV DNA test is available for selected uses
- ❖ Condoms partially effective against HPV in women

