Online Learning Module: HPV Vaccine
Learning Objectives

• Describe the available HPV vaccines and their recommended use
• Describe HPV vaccine efficacy and safety
• Discuss the potential use of the HPV vaccine in HIV-infected individuals
• Discuss the potential use of and barriers to the HPV vaccine in Africa
Review of HPV - 1

• HPV is a virus (DNA) that infects the lining of the cervix, vagina, vulva and penis
• HPV is transmitted through sexual contact
• Most infections are asymptomatic and self-limiting
• Persistent HPV can cause precancer and cancer
Review of HPV -2

• There are over 100 different types of HPV, at least 13 of which can cause cancer of the cervix
• The two most common HPV types are 16 and 18, which cause 70% of cancers of the cervix
• HPV types 6 and 11 can cause genital warts
Review of HPV - 3

- Eight most common cancer-causing HPV types: 16, 18, 31, 33, 35, 45, 52, 58
- HPV types 16, 18 account for 70% of cancers – each other type responsible for 5% of cases
Risk factors for progression of HPV to cancer

- Early sexual intercourse
- Immune suppression
- Cigarette smoking
- Multiparity
- Early age at first delivery
- Long term use of oral contraceptives
HPV vaccine

- Produced from virus-like particles
- Purpose is prevention of infection and not treatment
- Two HPV vaccines have been developed
  - Quadrivalent (Merck & Co, Inc) – 6, 11, 16, 18
  - Bivalent (Glaxo Smith Kline) – 16, 18
- Goal – reduce the incidence of HPV-related genital disease
How the HPV Vaccine Works

• Prepared from virus-like particles (VLPs) produced by recombinant technology
• Do not contain any live biological product or DNA, so they are non-infectious
HPV Vaccine Efficacy - 1

- HPV vaccines are designed to be prophylactic not therapeutic
- Lower protection among women already infected with vaccine-related HPV genotypes
- Efficacy depends on epidemiology of HPV in the population
- Safety and effectiveness not yet evaluated in Africa or in populations with high prevalence of immunosuppression
HPV vaccine Efficacy - 2

• Both vaccines showed high efficacy
• No efficacy data available to support use of vaccine in males.
• Duration of vaccine protection – at least 5 years and likely longer
• Cross-protection - Possible
Screening after HPV vaccination

- HPV vaccine *reduces* but doesn’t *eliminate* risk of cervical cancer
- Cancer can still be caused by other HPV types not in the vaccine
- Screening still required after vaccination
- Screening also required for women already infected with HPV
HPV Vaccine Administration

- 3 intra-muscular injections over a 6-month period
- 15-minute waiting period after vaccination.
Quadrivalent

- Gardasil ® or Silgard ®
- HPV 16, 18, 6, 11
- United States recommendations
  - Routinely recommended for 11 and 12 year old girls
  - Vaccine series can be started at 9 years of age.
  - Catch-up vaccination for females ages 13 to 26.
### Bivalent

- **Cervarix ®**
- **HPV 16, 18**

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WHO recommendations

• Routine HPV 16/18 vaccination should be included in immunization programmes of all countries where
  – Prevention of cervical cancer and other HPV-related diseases is a public health priority
  – Vaccine introduction is programmatically feasible
  – Sustainable financing can be secured
• Primary target – Young adolescent girl before onset of sexual activity
Who can be given the vaccine?

• HPV vaccine can be given to females who:
  – Are lactating
  – Have minor acute illness
  – Have abnormal Pap test, +HPV test or genital warts
  – Are immunocompromised
Who cannot be given the vaccine?

• HPV vaccine can not be given to females who:
  – Are pregnant
  – History of immediate hypersensitivity to yeast or any vaccine component
  – Moderate or severe acute illnesses
HPV Vaccine Safety

• HPV vaccine is safe
• Most common adverse event – Pain at injection site
• Providers should consider a 15-minute waiting period for vaccine recipients following vaccination.
Counseling messages for patients

- Important to give all three doses of the vaccine to get its full benefits
- Women still need regular cervical cancer screening
- Continue to practice abstinence or protective sexual behaviors
The Potential of HPV Vaccine in Africa
Factors influencing benefits from HPV vaccination

• Burden of HPV disease attributable to the genotypes against which the vaccines protect
• Vaccine efficacy
• Availability of screening services
• Achievable vaccine coverage**
• Duration of protection
• Effect on cervical cancer screening
Cost-Effectiveness of the HPV Vaccine in Developing Countries

- Price needs to be reduced to make vaccination cost-effective.
- Brazil study - Vaccination alone is likely to be more cost-effective than screening 2 or 3 times per lifetime in developing countries.
- Higher delivery costs because will need to implement adolescent vaccination program.
HPV Vaccine in HIV+ women - 1

• Efficacy unknown
• HIV+ women have
  – A high HPV infection prevalence
  – Co-infection with multiple oncogenic HPV types
• Vaccine impact questionable if predominant HPV types are not 16 or 18
• Safety must also be assessed
HPV Vaccine in Africa? - 1

- Data not yet available on safety and efficacy of HPV vaccines in Africa or in populations with high HIV prevalence.
- HPV types other than types 16 and 18 are more common in populations in Africa, such as HIV+ women.
- Vaccines may not induce protective immunity in these populations
- More investigations are needed worldwide
• Successful vaccination programs in Africa will likely require broader polyvalence, lower costs, and community and provider education and acceptance.
Questions to be answered before vaccine implementation

- What is the best delivery strategy?
- What is the best age for community-based delivery?
- Vaccination of girls only or girls & boys?
- Integration with other interventions?
- Monitoring of HPV vaccination program?
- Patient, parent and community education?
Conclusions

• In developing countries, HPV-induced cervical is leading cause of cancer death in women
• HPV vaccines very effective in preventing disease caused by vaccine-related HPV genotypes
• Additional data is needed on the safety, efficacy and cost-effectiveness of HPV vaccines in Africa
• Successful vaccination programs in Africa will likely require broader polyvalence, lower costs, and community and provider education and acceptance.
Sources

• WHO – Candidate recommendations for use of HPV vaccines in national immunization programmes, for consideration by the WHO immunization Strategic Advisory Group of Experts. Available at: www.who.int/entity/immunization/sage/1_HPVCandrecommendationsSAGEyellowbookFINAL.pdf
Sources

• Bollen et al. HPV detection among HIV-infected pregnant Thai women: implications for future HPV immunization. Sex Transm Dis. 2006;33(4): 259-64
1. The HPV vaccine is an example of:
   (a) Primary prevention against HPV infection
   (b) Secondary prevention against HPV infection
   (c) Treatment for HPV infection
   (d) Cure for HPV infection

2. The HPV vaccine is prepared from:
   (a) Virus-like particles (VLPs) and is therefore infectious
   (b) VLPs and is therefore uninfectious
   (c) Live, attenuated HPV virus
   (d) None of the above
3. HPV vaccines currently on the market protect primarily against
   (a) HPV-16 and HPV-18 infection
   (b) HSV-1 and HSV-2 infection
   (c) HIV infection
   (d) None of the above

4. Following HPV vaccination, cervical cancer screening remains important because:
   (a) HPV vaccination reduces but does eliminate the risk of HPV infection
   (b) Women may have been infected with HPV prior to vaccination
   (c) Cervical cancer may be caused by an HPV type that is not contained in the vaccine
   (d) All of the above
Evaluation Score

- Congratulations!
- You passed this evaluation with a score of ________

- Please click on the CERTIFICATE button below to print your certificate. Be sure to print & sign your name before submitting the certificate to your supervisor.
“Every woman has the right to live a life free from cervical cancer”