Human Papillomavirus (HPV) Vaccination

Summary of National Advisory Committee on Immunization (NACI) Recommendations 2007-2016

The Public Health Agency of Canada has stated that the goal of the national Human Papillomavirus (HPV) immunization program is to reduce vaccine-preventable HPV-related morbidity and mortality in the Canadian population. There are three HPV vaccines licensed for use in Canada. The following is a summary of the recommendations from the four NACI Statements on HPV vaccination.

SUMMARY

What

Human papillomavirus (HPV) infections are the most common sexually transmitted infections. There are over 100 types of HPV, and they are broadly classified into high and low risk types.

Low-risk HPV types can cause condylomata acuminata, also called anogenital warts (AGWs).

High-risk HPV types can lead to cervical cancers and have also been implicated in more rare cancers of the vulva, vagina, penis, anus, oral cavity, and oropharynx, larynx and periungual skin.

How

2016 Recommended Immunization Schedule with HPV Vaccines

RECOMMENDED GROUPS	RECOMMENDED IMMUNIZATION SCHEDULE	VACCINE(S) and NACI EVIDENCE GRADE (see Appendix 1)
Healthy (immunocompetent, non-HIV infected) Females 9-14 years of age (and healthy females >15 years of age in whom the first dose was administered between 9-14 years of age)	2- or 3-dose schedule	HPV2 or HPV4 (Grade A)
	3-dose schedule	HPV9 (Grade B)
Healthy (immunocompetent, non-HIV infected) Females >15 years of age	3-dose schedule	HPV2 or HPV4 (Grade A) or HPV9 (Grade B)
Healthy (immunocompetent, non-HIV infected) Males 9-14 years of age (and healthy males >15 years of age in whom the first dose was administered between 9-14 years of age)	2- or 3-dose schedule	HPV4 (Grade B)
	3-dose schedule	HPV9 (Grade B)
Healthy (immunocompetent, non-HIV infected) Males >15 years of age	3-dose schedule	HPV4 or HPV9 (Grade B)
Immunocompromised individuals and immunocompetent HIV-infected individuals	3-dose schedule	HPV2, HPV4 or HPV9 in females; HPV4 or HPV9 in males (Grade I)

Who

Females:

HPV2 vaccine is indicated for females 9 to 45 years of age for the prevention of cervical cancer and pre-cancerous lesions associated with the HPV types contained in the vaccine.

HPV4 and HPV9 vaccines are indicated for the prevention of the following diseases associated with the HPV types contained in the vaccines:

In females 9 to 45 years of age

- Cervical, vulvar, vaginal cancers and pre-cancerous lesions
- AGWs.

In females 9 to 26 years of age

- Anal cancer and pre-cancerous lesions.

Males:

HPV4 and HPV9 vaccines are indicated in all males 9 to 26 years of age for the prevention of anal cancers, pre-cancerous lesions and AGWs. HPV2 vaccine is not indicated in males at this time.

HPV vaccines are not recommended for:

- females or males < 9 years of age as no immunogenicity or efficacy data are available in these groups.

Why

In the absence of vaccination, it is estimated that 75 per cent of sexually active Canadians will have a sexually transmitted HPV infection at some point in their lives. Even if a person is already infected with one or more vaccine HPV type(s), the vaccine will provide protection against the other HPV type(s) contained in the vaccine.

According to NACI's Advisory statement in 2016, in Canada, immunization against HPV types 16 and 18 with HPV2, HPV4 or HPV9 vaccine can prevent approximately 70% of anogenital cancers and 60% of high-risk precancerous cervical lesions. Immunization with either HPV4 or HPV9 vaccine can prevent approximately 90% of AGWs (HPV types 6 and 11). Immunization with HPV9 vaccine can prevent up to an additional 14% of anogenital cancers and up to 30% of high-risk precancerous cervical lesions caused by the other five HPV types (31, 33, 45, 52 and 58) against which the vaccine protects.

National Collaborating Centre for Infectious Diseases
Centre de collaboration nationale des maladies infectieuses

Vaccine Administration Summary

	HPV4 (Gardisil)	HPV2 (Cervarix)	HPV9 (Gardisil 9)
Immunogens *(Recombinant L1 proteins from HPV types)*	16, 18	6, 11, 16, 18	6, 11, 16, 18, 31, 33, 45, 52, 58
Dose	0.5 mL intramuscularly		
Schedule	0, 2, and 6 month schedule	0, 1, and 6 month schedule	0, 2, and 6 month schedule
Pregnancy	-vaccine not recommended during pregnancy -phase III studies and voluntary pregnancy registry show no difference in pregnancy outcomes between vaccine recipients and controls (1,2)	-vaccine not recommended during pregnancy -epidemiological and phase III studies show no difference in pregnancy outcomes between vaccine recipients and controls (3-5)	-vaccine not recommended during pregnancy -no human studies -studies performed in rats revealed no evidence of harm to fetus (6)
Breastfeeding	Data not available		
Contraindications	-Should not be administered to individuals with a known history of hypersensitivity to any of the vaccine components	-Should not be administered to individuals with a known history of hypersensitivity to any of the vaccine components -prefilled syringes contraindicated for persons with anaphylactic latex allergy.	-Should not be administered to individuals with a known history of hypersensitivity to any of the vaccine components
Precautions	Syncope (fainting) may follow any vaccination, especially in adolescents and young adults.		
Duration of Protection	Three-dose: A review of studies with follow up of 9.4 years for the HPV2 vaccine, and follow up of 8 years for the HPV4 vaccine found that the vaccine continues to be immunogenic and well tolerated up to 9 years following vaccination, and that all randomized controlled clinical trials of the two vaccines provide evidence of an excellent safety profile (7). Two dose: No studies available.		
Cervical Cancer Screening	All women should continue to take part in the currently recommended cervical cancer screening programs.		
Interchangeability of HPV vaccines	-use one brand of vaccine to complete a vaccine series -if the brand for previous vaccinations is unknown, HPV2, HPV4, or HPV9 vaccine may be used to complete the series for genotypes 16 and 18. -there are no interchangeability data for HPV vaccines		
Minimum Intervals -not recommended -Minimum intervals are to be used only if an abbreviated schedule is unavoidable	Between 1 & 2 dose – 4 weeks (1 month) Between 2 & 3 dose – 12 weeks (3 months) Between 1& 3 dose – 24 weeks (6 months) Evidence to support a shortened dose interval is weak (8-10): -shortened “flexible” dosing relies on unpublished manufacturer’s data -predominantly retrospective studies -non-inferiority and duration of immunity not explicitly indicated in studies -results from these studies are not stratified by dose interval		
Co-administration of vaccines	- can be administered simultaneously with other adolescent vaccines - three RCT studies show safety and immunogenicity with DTaP-IPV vaccine, conjugate meningococcal vaccine, and other adult/adolescent formulations of tetanus, diphtheria and acellular pertussis vaccines (11-13)	- can be administered simultaneously with other adolescent vaccines - five manufacturer’s studies show safety and immunogenicity with hepatitis B, hepatitis A/B vaccine, Tdap, Tdap-IPV, or quadrivalent meningococcal conjugate vaccine (14,15)	- no recommendation - two randomized control trials show safety and immunogenicity with DTaP-IPV vaccine, conjugate meningococcal vaccine, and other adult/adolescent formulations of tetanus, diphtheria and acellular pertussis vaccines (16,17)
Storage	Store refrigerated at 2°C to 8°C. Do not freeze. Protect from light.		
Cold chain	Can be administered as long as cumulative time out of refrigeration does not exceed 72 hours at temperatures between 8°C and 25°C	Can be administered as long as cumulative time out of refrigeration does not exceed 72 hours at temperatures between 8°C and 25°C or 24 hours at temperatures between 25°C and 37°C	Can be administered as long as cumulative time out of refrigeration does not exceed 72 hours at temperatures between 8°C and 25°C

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Glossary
RCT = randomized control trial