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NATIONAL SURVEILLANCE OF COMMUNICABLE DISEASES

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QUESTIONS AND ANSWERS ON HPV VACCINATION

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In 2006, the first vaccine against human papilloma virus (HPV) was introduced to the Danish market, EPI-NEWS 42/43-06. The vaccine is tetravalent, preventing HPV types 6, 11, 16 and 18. A bivalent HPV vaccine targeting types 16 and 18 is expected to be approved in 2007. The Department of Epidemiology has received a number of questions regarding HPV infection and vaccination which are answered below.

What is HPV infection?
There are more than 100 known HPV types, of which approximately 40 are associated with anogenital infection. A minimum of 12 HPV types are oncogenic. Persisting infection with one of these types is a prerequisite to cervical cancer and a number of other more infrequent types of cancer, Table 1.
A total of 70% of all cervical cancer cases are associated with HPV type 16 or 18.
Furthermore, HPV causes condyloma (venereal warts), a benign but troublesome disease which affects males and females alike. 90% of condyloma cases are caused by HPV types 6 or 11.

How common is HPV?
HPV is primarily transmitted by sexual contact and the majority of sexually active females and males become infected at some point. The occurrence peaks in the years following sexual debut and concurrent infection with several types is frequent. The majority of infections are asymptomatic and resolve spontaneously.

What is the risk of cervical cancer?
While a total of 60-80% of all females becomes infected with HPV, the life time risk of cervical cancer is approximately 1%.
In Denmark, some 400 cases are detected annually. Occurrence has decreased in later years, primarily thanks to the cervical cancer screening programme.

How effective is the vaccine?
The vaccine provides nearly 100% protection against persistent HPV infection with the types it contains. It is an offer to future generations of sexually active persons which may potentially prevent the majority of cervical cancer cases. Furthermore, the tetravalent vaccine may potentially prevent the majority of condyloma cases.

Who may be vaccinated?
The vaccine is registered for use in children and adolescents aged 9-15 years of both sexes and females aged 16-26 years. The optimal effect is obtained by vaccinating before the sexual debut, i.e. children aged 10-13 years.

Table 1. Cancer types caused fully or partially by HPV

Cancer type	No. (%) caused by HPV	No. (%) of HPV assoc. cases caused by HPV 16 & 18	Average no. of cases in Denmark
Cervix uteri	100	70	430
Vagina	64-91	80	25
Ext. female genitalia (vulva)*	40	80	85
Penis*	40	63	30-50
Rectum	90	92	60-80
Non-genital cancer types			
Oropharynx	12	89	150
Oral cavity	3	95	180

** For vulva and penis, one type in particular, the warty-basaloid type, is associated with HPV infection. Of these cases, 60-90% are HPV associated*

May males be vaccinated?
The vaccine is safe and also associated with a considerable immune response in males. Presently, the data needed to assess the prophylactic effect in males is scarce.

Should a person who has had an HPV infection or who has had cell changes detected be vaccinated?
The vaccine's prophylactic effect has not been demonstrated in females who have had or currently have an HPV infection. The vaccine has no therapeutic effect on HPV-associated cell changes or condyloma.

What are the vaccination intervals?
When using the tetravalent HPV vaccine, three injections at day 0, and subsequently after 2 months and after 6 months are recommended. The minimum interval separating 1st and 2nd vaccination is one month, and the interval between 2nd and 3rd vaccination is three months. All three doses must be administered within one year. The effect of vaccinations administered more than one year after the initial vaccination is not currently known.

Is revaccination needed?
At present it has been demonstrated that the prophylactic effect of the primary vaccination series remains effective for a minimum of 5 years. Studies with longer follow-up periods will determine if revaccination after a number of years is necessary.

May the HPV vaccine be given in conjunction with other vaccines?
The vaccine may be administered in conjunction with other vaccines, but at separate injection sites.

Adverse events
Local responses presenting as redness, swelling and tenderness around the injection site are frequent. Apart from local responses, the vaccine has only caused few and non-serious adverse effects. Transient systemic responses such as low fever or malaise are also relatively frequent.

Can HPV vaccine cause HPV infection?
No, the vaccine does not contain virus DNA and consequently cannot cause infection of the vaccinee.

Is testing needed prior to vaccination?
No, as it is not possible to establish with any certainty if a person was previously infected with HPV.

Is the vaccine an alternative to cervical cancer screening?
No. HPV vaccination does not prevent all HPV types and it is thus important that vaccinated females participate in the cervical cancer screening programme.

Who pays for the vaccine?
Currently, HPV vaccination is not subsidized, and consequently the person receiving the vaccination defrays the expenses.

Commentary
This autumn, the National Board of Health will prepare a recommendation for the Ministry of the Interior and Health on the future placement of the HPV vaccination relative to the childhood vaccination programme, among others. The recommendation is partly based on a health technology assessment concerning the use of HPV vaccination for cervical cancer prophylaxis, EPI-NEWS 21-22/07 or www.ssi.dk.
(A.H. Christiansen, M. Howitz, C. Kjelsø, K. Mølbak, Dept. of Epidemiology)

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Individually notifiable diseases

Number of notifications received in the Department of Epidemiology, SSI (2007 figures are preliminary)

Table 1	Week 33 2007	Cum. 2007 [1]	Cum. 2006 [1]
AIDS	0	36	29
Anthrax	0	0	0
Botulism	0	0	0
Cholera	0	0	0
Creutzfeldt-Jakob	0	6	13
Diphtheria	0	0	0
Food-borne diseases	16	358	324
of these, infected abroad	4	63	79
Gonorrhoea	2	235	280
Haemorrhagic fever	0	0	0
Hepatitis A	0	17	14
of these, infected abroad	0	6	4
Hepatitis B (acute)	1	16	13
Hepatitis B (chronic)	4	179	230
Hepatitis C (acute)	1	4	6
Hepatitis C (chronic)	13	242	354
HIV	4	186	137
Legionella pneumonia	0	65	71
of these, infected abroad	0	14	19
Leprosy	0	0	0
Leptospirosis	0	7	6
Measles	0	1	26
Meningococcal disease	1	48	56
of these, group B	1	27	28
of these, group C	0	15	10
of these, unspec. + other	0	6	18
Mumps	0	3	10
Neuroborreliosis	2	50	25
Ornithosis	1	7	8
Pertussis (children < 2 years)	3	47	34
Plague	0	0	0
Polio	0	0	0
Purulent meningitis			
Haemophilus influenzae	0	1	1
Listeria monocytogenes	0	7	6
Streptococcus pneumoniae	0	79	63
Other aethiology	0	10	4
Unknown aethiology	0	9	16
Under registration	1	11	-
Rabies	0	0	0
Rubella (congenital)	0	0	0
Rubella (during pregnancy)	0	0	0
Shigellosis	3	37	35
of these, infected abroad	0	22	30
Syphilis	2	64	46
Tetanus	0	0	2
Tuberculosis	8	264	247
Typhoid/paratyphoid fever	2	11	17
of these, infected abroad	2	10	17
Typhus exanthematicus	0	2	0
VTEC/HUS	8	101	86
of these, infected abroad	2	28	28

[1] *Cumulative number 2007 and in corresponding period 2006*

Selected laboratory diagnosed infections

Number of specimens, isolates, and/or notifications received in SSI laboratories

Table 2	Week 33 2007	Cum. 2007 [2]	Cum. 2006 [2]
Bordetella pertussis (all ages)	7	116	134
Gonococci	5	241	283
of these, females	1	37	52
of these, males	4	204	231
Listeria monocytogenes	1	33	28
Mycoplasma pneumoniae			
Resp. specimens [3]	3	256	273
Serum specimens [4]	4	303	239
Streptococci [5]			
Group A streptococci	6	82	107
Group B streptococci	9	62	62
Group C streptococci	5	16	15
Group G streptococci	11	81	95
S. pneumoniae	16	710	691
Table 3	**Week 31 2007**	**Cum. 2007 [2]**	**Cum. 2006 [2]**
MRSA	16	354	-
Pathogenic int. bacteria [6]			
Campylobacter	119	2087	1591
S. Enteritidis	21	275	275
S. Typhimurium	9	181	211
Other zoon. salmonella	14	412	351
Yersinia enterocolitica	3	163	108
Verocytotoxin-producing E. coli	3	101	78
Enteropathogenic E. coli	5	103	131
Enterotoxigenic E. coli	5	129	142

[2] *Cumulative number 2007 and in corresponding period 2006*

[3] *Resp. specimens with positive PCR*

[4] *Serum specimens with pos. complement fixation test*

[5] *Isolated in blood or spinal fluid*

[6] *See also www.germ.dk*

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