

## The free vaccination programme is expanding

### Are you providing the best vaccine coverage?

The (free) Quebec vaccination programme is constantly evolving. Consequently, we have to adjust our practices to different clienteles: new vaccines, new target populations, altered schedules, multiple injections.

Here are some concrete cases to help you discover what's new and prepare yourself to meet these challenges!

#### May 2005

*You see Samuel Beaudry-Wong for the first time. Samuel is a beautiful, healthy 6 ½-month-old baby. He lives with his father, who is of Chinese origin, his mother and his older sister Naomi, who is 3 years old. Samuel and Naomi have a babysitter, Elena, who looks after them in their home. You give Samuel his third dose of DTaP-polio-Hib (Pentacel) to update his vaccination. His mother asks why you are not giving him a third dose of pneumococcus vaccine: "My nephew Tommy is 7 months old. He lives in Toronto and his paediatrician gave him a third dose just last week." What do you say to this mother?*

immunization (NACI, ACIP, etc.) is omitted. The QIC recommended this schedule based on the most recent immunogenicity and efficacy study results and on economic studies. Although a 4-dose programme might be slightly more effective than a 3-dose one (additional decrease in morbidity evaluated at less than 1% for the 4-dose programme), the number of extra cases prevented among healthy children when this dose is given at 6 months is deemed so low that the extra cost per case prevented is difficult to justify, especially when other vaccination programmes (e.g. varicella) that convey very tangible benefits to children are still awaiting funding.

*Given that the father comes from a zone where hepatitis B is highly endemic, you check with the mother if the child has been vaccinated for this virus. The mother says that to date, she has refused this vaccine because she read on the Internet that there could be a link between the vaccine and the risk of developing neurological illnesses such as multiple sclerosis.*

It is normal and legitimate that a parent worries about the possible risks associated with vaccines. Once you have indicated to Samuel's mother that you understand her concerns, you can then offer your reassurances on this issue and encourage her to have Samuel and Naomi vaccinated, if the latter has never received the vaccine. The results of several recent case-control studies have provided enough proof for the Institute of Medicine (IOM) (USA) to dismiss the

notion of a causal relation between hepatitis B vaccine and multiple sclerosis (MS). Moreover, a European study conducted in 2001 also demonstrated that vaccinating individuals with MS against HBV does not increase the risk of relapse over the short term. As for other neurological diseases, the IOM estimates that there is no proof to support or invalidate a link between hepatitis B vaccination and other pathologies related to myelin sheath disorders such as optic neuritis, acute disseminated encephalomyelitis, transverse myelitis, Guillain-Barré syndrome (GBS) or brachial neuritis. Since the only reports of these cases are anecdotal, the IOM suggests that case-control studies be conducted on these topics. Everyone agrees, however, that hepatitis B vaccination programmes should be encouraged and continued. Hepatitis B remains an infection that can potentially have serious consequences, especially if acquired at a young age. In some cultural communities who come from zones where hepatitis B is endemic, the risk of young children being exposed is real. For this reason, preventive vaccination for Samuel and Naomi should be encouraged.

November 2005

**Samuel is 12 months old. What other vaccines will you offer Samuel beside MMR and serogroup C meningococcal vaccine? What about his family?**

## Varicella vaccine

Although varicella vaccine has not yet been integrated into the routine vaccination schedule and, according to suppliers, the vaccine costs between \$50 and \$70, physicians and nurses should nonetheless recommend varicella vaccine to all susceptible individuals aged 12 months and over.

Contrary to popular belief, varicella is not a mild disease. The vaccine does not only avert inconveniences, it also prevents the illness and its complications. Universal varicella vaccination could reduce severe cases of group A  $\beta$ -haemolytic streptococcal infections in children by at least 15%.

Like other medical associations and the National Advisory Committee on Immunization (NACI), the Comité sur l'immunisation du Québec (CIQ) recommends implementing a universal vaccination programme at 12 months; this programme should include a 5-year catch-up component (vaccination of susceptible children just starting school or in grade 4). Until this programme is made official, the cost of the vaccine must be borne by vaccine recipients or their families; however, the vaccine is free for susceptible persons living with people who are immunosuppressed and have no history of varicella, and susceptible individuals waiting for a transplant or immunosuppressive treatment. A person who has had varicella in the past is considered protected. Since 70% to 95% of individuals aged 13 years and over who have a negative or unknown history of varicella are immune, serological testing before vaccination can be cost beneficial; however, this proportion is not as high among adults originally from tropical countries.

*Varicella is very contagious and causes about two deaths and 400 to 500 hospitalisations a year in Québec, that is, 1 out of every 200 cases of varicella. Over 65% of hospitalisations are among previously healthy people with no risk factors. Complications following varicella will occur among 5% to 10% of children who are otherwise healthy. Skin infections (impetigo and cellulitis) account for half of the complications observed. Over the last several years, we have observed an increase in severe gangrenous group A beta-haemolytic streptococcal infections: skin gangrene, necrotizing fasciitis and toxic shock syndrome.*

## Acellular pertussis vaccine (dTaP)

Since the early 1990s, we have witnessed a resurgence of whooping cough and there have been pertussis epidemics as serious as those that occurred in the 1950s. Adolescents born between 1985 and 1992 have a higher risk of contracting whooping cough because the vaccine used in Canada during those years did not confer the expected protection. The proportion of adults who develop pertussis has also increased since these people are progressively losing their immunity.

The arrival of acellular pertussis vaccine in 1998 considerably improved the situation of children since it is much more effective (85%) than the whole cell vaccine previously available in Canada.

Acellular pertussis vaccine combined with diphtheria and tetanus toxoids (dTaP) is now available for adolescents and adults. One dose is indicated for all individuals who have never received acellular pertussis vaccine; dTaP can be used to offer primary immunization to young people aged 7 to 17 who have never received diphtheria, pertussis and tetanus vaccine.

A dTaP vaccination programme has been implemented for secondary III students. Moreover, people who are at greater risk of exposure to whooping cough, or of contracting or transmitting the disease to susceptible individuals (such as newborns) should receive a dose of vaccine at any opportune moment, no matter how long it has been since they have had a vaccine with a tetanus component.

**Samuel's father was given a booster dose of  $d_2T_5$  six months ago after he had been injured. Should you be concerned about more serious side effects if he receives a dose of dTaP**

A study conducted among 465 young Montreal students in 2004 strongly suggests that prior vaccination (administered less than 5 years earlier) with  $d_2T_5$  does not increase the risk of post-immunisation clinical manifestations when

dTaP is administered. This holds particularly true for significant local reactions that can occur following vaccination with  $d_2T_5$ . These results corroborate the findings of a study conducted in the Yukon in 2003.

Therefore, giving dTaP to Samuel's parents is indicated, no matter how long it has been since the last  $d_2T_5$  was administered.

### Pertussis vaccination (dTaP) for adolescents and adults who have never received acellular vaccine

Adolescents	Adults at greater risk*	Other adults
For adolescents who did not take advantage of the systematic vaccination programme in schools in secondary III:  Vaccinate when the occasion arises.	Vaccinate when the occasion arises.	Vaccinate when the occasion arises.
No minimum interval required after administration of a vaccine that included the tetanus component.		Minimum interval of 5 years since a vaccine including the tetanus component was administered.
*Future parents or parents of young children, and staff and trainees in health institutions, daycares and early childhood centres, and in primary and secondary schools.		

# Influenza vaccine

Since autumn 2004, Quebec's influenza vaccination programme has targeted children 6 to 23 months old.

Studies conducted over a number of years and among thousands of children have highlighted the scope of the problem of influenza in very young children. At least four large American studies have demonstrated increased hospitalisations of healthy children under 5 years of age, with the youngest being the most affected. Additional medical consultations and antibiotic prescriptions attributable to influenza were also observed.

The risk of hospitalisation for an influenza-related condition among healthy children under 2 years old was comparable to the risk among healthy people 65 years of age and over.

During the 2004-5 season, over 400 hospitalisations associated with influenza (and confirmed in laboratory) were reported in 10 Canadian paediatric centres participating in the IMPACT network; over half of these cases were between 0 and 23 months of age.

Children aged 6 months to 8 years (inclusively) who receive influenza vaccine for the first time should be given 2 doses of vaccine at an interval of 1 month.

Vaccination of the household contacts and caregivers of children under 2 years old is also recommended and is covered by the free vaccination programme.

Consequently, influenza vaccine should be offered to Samuel and Naomi, their parents and Elena, the babysitter.

*Clinical characteristics of influenza in children can vary from asymptomatic infection to serious illness. In most cases affecting healthy children, influenza will evolve favourably and will leave no sequelae.*

*Some cases can develop serious complications, some of which occur frequently (e.g. acute otitis media, laryngotracheobronchitis, secondary bacterial infections), whereas others are more rare (e.g. myositis, toxic shock syndrome, myocarditis).*

## How many injections in one visit?

**The mother agrees that Samuel should get all these vaccines but is unsure that he should receive so many injections during one visit. What do you recommend?**

about administering several injections at the same time. This practice does not affect vaccine effectiveness nor does it increase the frequency or intensity of side effects. Not only is the number of consultations reduced, but so is the time during which the child is not protected against certain diseases.

The Quebec Immunization Protocol (PIQ) recommends administering all doses of required vaccines during one visit. Recent studies have shown that vaccine providers are more hesitant than parents

## December 2005

**Samuel's mother has suggested to Elena, 42, that she make an appointment with you to receive influenza vaccine. You take advantage of her visit to update her immunization status. You learn that she underwent a splenectomy following a car accident 15 years ago in Romania. You also find out that she is diabetic. Which vaccines will you offer her to reduce her vulnerability to infectious agents?**

We can reduce morbidity and mortality associated with a number of infectious diseases among people with certain medical conditions by using available vaccines judiciously.

In addition to basic vaccines, here are examples of vaccines that are indicated for patients with asplenia, diabetes or HIV infection.

### Specific vaccinations recommended for adults with certain risk factors

#### ASPLENIA\*

Recommended vaccines:

- **Influenza** (yearly) (patient and household contacts)
- **Hib** (Act-Hib): 1 dose only
- **Pneumococcus** (Pneumovax, Pneumo-23):  
One 23-valent dose

Revaccination: once only (after 5 years)

- **Meningococcus**
  - Serogroup C conjugate vaccine (Neis-Vac-C, Menjugate, Meningitec) followed 2 weeks later by:
  - Polysaccharide vaccine (A, C, Y, W-135) (Menomune).  
Repeated every 5 years.

\* If elective surgery, vaccinate 10-14 days before the surgery.

#### HIV INFECTION

Recommended vaccines:

- **Influenza** (yearly) (patient and household contacts)
- **Pneumococcus** (Pneumovax, Pneumo-23) :  
One 23-valent dose  
Revaccinate once only (after 5 years)
- **Varicella** (Varivax, Varilrix)  
(patient and susceptible contacts)  
To evaluate based on level of immunosuppression\* and immune status of the patient and his or her contacts.

\* Live vaccines are contraindicated if state of immunosuppression is serious; it is preferable to consult a specialist who is very familiar with both the disease and the vaccine.

#### DIABETES

Recommended vaccines:

- **Influenza** (patient and household contacts)
- **Pneumococcus:** (Pneumovax, Pneumo-23)  
One 23-valent dose  
Do not revaccinate\*

\* Currently, systematic revaccination against pneumococcal infections is only recommended for patients with asplenia or who are immunosuppressed.

## Routine immunization schedule

Age	Vaccines
2 months	DTaP-Polio-Hib <sup>1</sup> Pneumococcal conjugate
4 months	DTaP-Polio-Hib Pneumococcal conjugate
6 months	DTaP-Polio-Hib
6-23 months	Influenza
12 months	MMR <sup>2</sup> Meningococcal conjugate Pneumococcal conjugate Varicella*
18 months	DTaP-Polio-Hib MMR
4-6 years	DTaP-Polio
4 <sup>th</sup> grade primary	Hepatitis B
14-16 years	DTaP <sup>3</sup> (d <sub>2</sub> T <sub>5</sub> booster every 10 years)
60 years and over	Influenza (yearly)
65 years	Pneumococcal polysaccharide (once)

1. Diphtheria (D), pertussis (aP), tetanus (T), poliomyelitis (Polio), haemophilus influenzae type b (Hib)
2. Measles (M), mumps (M), rubella (R)
3. Diphtheria (d), pertussis (aP), tetanus (T)

\* Recommended but not yet free

## Reminder

- Offer healthy children a dose of pneumococcal conjugate vaccine at two months and four months of age, and a booster at one year.
- Offer influenza vaccine to all children aged 6 to 23 months, as well as to all household contacts of children under 2 years old.
- Offer varicella vaccine to any susceptible individual aged 1 or over.
- Administer live attenuated vaccines (MMR and varicella) at the same time or at an interval of at least 4 weeks so as to not interfere with the development of the immune response.
- Offer hepatitis B vaccine to all children from a country of origin where hepatitis B is very common.
- Offer a dose of dTaP vaccine to all adolescents and adults who have never received a dose of acellular vaccine.
- Check children's and adults' vaccination booklets and refer if needed.

## References

The **Protocole d'immunisation du Québec** is the basic reference for vaccination.

You can buy a copy at all regional public health departments.

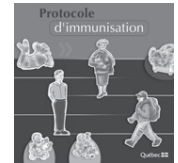
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**Institut national de santé publique:** <http://www.inspq.qc.ca/domaines/MaladiesInfectieuses/Immunisation.asp>

**National Advisory Committee on Immunization:** <http://www.phac-aspc.gc.ca/naci-ccni/index.html>

**The Canadian Coalition for Immunization Awareness & Promotion (CCIAIP):** <http://www.immunize.cpha.ca/english/index-e.htm>

**Institute of Medicine (USA):** <http://www.iom.edu/>



## Prévention en pratique médicale

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# Are Montreal children adequately vaccinated?

From October 2003 to April 2004, the Montreal Public Health Department conducted a survey on the vaccine coverage of Montreal children aged 24 to 30 months. Based on a random sample of 600 children born between 1 March and 31 August 2001 and lived in Montreal at the beginning of the survey, the study evaluated the vaccine status of 506 children (participation rate: 86%), through either a telephone interview (462) or a mailed questionnaire (44). Information was obtained from children's vaccination booklets and, when required, validated with the vaccine providers identified. Vaccination information could not be completed for 19 participants (4%).

The vaccination schedule recommended for this cohort included 4 doses of combined vaccine (DaTP-Polio-Hib) against diphtheria, whooping cough, tetanus, poliomyelitis and Haemophilus influenzae type b (2, 4, 6 and 18 months), and 2 doses of combined vaccine (MMR) for measles, mumps and rubella (12 and 18 months). This cohort had also been the target of the meningococcal immunization campaign that took place in the fall of 2001.

## Here are a few highlights of the findings of this survey:

*For measures related to specific coverage by diseases:*

- 90% of children evaluated had received 4 doses of vaccine against diphtheria, pertussis, tetanus, poliomyelitis and Haemophilus influenzae type b;
- 96% of children had received at least one dose of measles vaccine, and 80% had received the two recommended doses;
- 90% of children had had at least one dose of serogroup C meningococcal vaccine.

*For combined measures related to vaccine coverage:*

- **82% of children had received all recommended doses of vaccine.**
- When non-valid doses of vaccine were excluded (minimum age or minimum interval between doses not respected), only 74% of children had received all required doses.
- Only 53% of children had received all required doses as per the recommended vaccination schedule.
- Only 2 children had had no vaccine doses.

*Children's origins:*

- 6% of the children were born outside Canada. They were from 17 different countries.
- 45% of respondents (mostly mothers) were born outside Canada (67 different countries).

*Health services available for these children:*

- 92% of children had a doctor;
- 74% of children had received at least one vaccine from their usual doctor;

- 68% of children had received at least one dose of vaccine in a CLSC. Note, however, that because of the meningococcal vaccination campaign, a large number of children who are usually vaccinated by their doctors received this vaccine at the CLSC.
- 55% of respondents identified a doctor's office as the main vaccination site, 34% a CLSC, 5% a hospital out-patient clinic and 4% somewhere outside Canada.

Despite the greater number of concerns raised by parents regarding childhood vaccination, it is clear that vaccination is accepted since a high proportion of children had received the recommended number of doses.

Providers' capacity to respond satisfactorily to the fears expressed by parents is undoubtedly a significant factor in attaining these results.

However, only half of children had a vaccination status that conformed to all existing recommendations. Additional efforts are required to protect all children even more adequately, especially in the area of access to vaccination services, missed opportunities to vaccinate, and respect of minimum ages and minimum intervals between doses.

In this perspective, the Public Health Department believes that three rules should be closely followed:

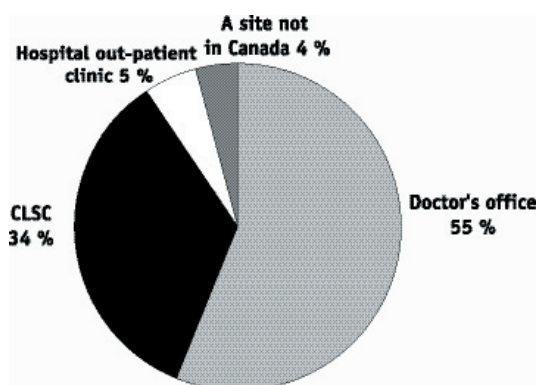
- Administer vaccines at the ages recommended in the Quebec vaccination schedule.
- Choose multiple injections over delaying vaccination.
- Check children's and adults' vaccination booklets and refer them as needed.



The Public Health Department thanks all vaccinators who contributed to the validation of vaccination information.

To register as a vaccination provider with the Public Health Department, contact Ms. Gisèle Oceau at 514 528-2400, ext. 3845.

## Distribution of the principal places where children who participated in the survey were vaccinated



# More than one out of five Montrealers were reached during the 2004-2005 influenza vaccination campaign

In 2004-2005, access to influenza vaccination was greatly expanded. You can now offer free vaccine to almost half of Montrealers. According to the MSSS programme criteria, children aged 6 to 23 months, persons 60 years old and over, individuals aged 2 to 59 with chronic diseases, health care workers and volunteers, and people living in a household with children under 2 years of age or with someone with a chronic disease are now eligible for free vaccine.

Compared with previous years, vaccination rates increased among people with chronic diseases (2 to 59 years old) (+4%) and individuals aged 65 years and over (+1%), in long-term care facilities (care recipients) (+1%), and among health care personnel (+6%). Numbers for the other categories were maintained. Moreover, among the new target groups: 32% of children 6- to 23-months old received two doses of vaccine, over 50% at least one dose, and a considerable number of household contacts of children under 2 years of age were also reached. Congratulations to our providers!

While preparing for the next campaign, during the year we need to highlight clientele who will remain the same for the 2005-2006 campaign and remind them right away not to forget to get vaccinated against influenza next fall.

**The next campaign will start on 17 October 2005 to facilitate vaccination of the greatest number of people before mid-December, that is, before the onset of influenza activity and holiday gatherings (a time when viruses are exchanged along with season's greetings).**

## Vaccine coverage among persons at risk and people who can transmit influenza

### Open community

Based on available data on the population targeted and data provided by 95% of vaccinating physicians on their use of vaccines, we estimate that in the community, influenza vaccine was administered to about:

- 62% of individuals aged 65 and over (166 287 people);
- 53% of individuals aged 60 to 64 (46 727 people);
- 42% of persons under 60 years of age who have chronic diseases (64 325 people) (Gain of 4 percentage points);
- 32% of children between the ages of 6 and 23 months (9 391 children).

We also note that influenza vaccine was administered

### in the community to:

- 37% of health care personnel in institutions as well as
- 33 573 household contacts (of children at least 2 years old or people under 60 years of age with chronic diseases)

### Institutions (long-term care facilities)

In institutions, vaccine was given to:

- 84% of elderly people in institutions;
- 38% of health care personnel (6-point gain over last year. Bravo!)

A reminder that the objective for vaccine coverage for all target groups is 80% by 2012.

### Influenza campaign 2005-2006 Target population, Montreal (estimate)

(Total population, 2005: 1 882 561)

Targeted individuals		Their household contacts
0-6 months (contacts)	(9 958)	29 874
6-23 months	30 129	90 387
2-59 years, chronic dis.	159 560	159 560
60-64 years	88 790	
65 years and over	285 087	
<b>Total</b>	<b>563 566</b>	<b>279 821</b>
<b>Health care personnel</b>		
Hospital/Rehabilitation centres	54 546	
Long-term care facilities	21 533	
CLSC	6 201	
<b>Total</b>	<b>82 280</b>	
<b>Total</b>	<b>645 846</b>	
<b>Total avec contacts</b>		<b>925 667</b>

Figure 1: Influenza vaccine coverage among risk groups (open community), Montreal, 2000-2001 to 2004-2005

