

Immunizations Part 2:

The New Vaccines – Are they indicated for your child?

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Over the last few years, several new vaccines have been introduced in Canada. These are recommended for children but they are not yet publicly funded in the majority of Canadian provinces nor are they covered by the majority of private health insurance plans. The fact that these vaccines are not yet publicly funded by all provinces does not mean that they are not important in protecting your child's health. These vaccines include the following:

Varicella vaccine (Chickenpox):

Chickenpox (varicella) is a common childhood infectious disease that infects >90% of the population by the time they are 12 years of age. Many parents consider it to be a benign illness, "a rite of passage", but this may not be the case for some children. There is significant medical morbidity from chickenpox and each year in Canada there are an estimated 1,700 to 2,200 hospitalizations for chickenpox or a related complication. Of the hospitalizations, 70% involve children younger than age five years and 90% involve children younger than 15 years. About two thirds of the cases are in otherwise healthy children.

Complications include: dehydration, skin and soft tissue infections, ear, nose and throat infections, hepatitis, serious bacterial infections such as necrotizing fasciitis (flesh eating disease), pneumonia, aseptic meningitis and encephalitis. Children can also die as a result of chickenpox and its complications. Between the years of 1987 and 1996 there were 14 deaths due to chickenpox in Canadian children less than 10 years of age. Chickenpox also leads to loss of wages for parents, missed school days for children, frequent visits to doctor's offices, clinics

and emergency rooms at a significant cost to families and the health care system.

In December 1998, a live attenuated varicella zoster virus vaccine was licensed for use in Canada. The National Advisory Committee on Immunization (NACI) recommends the vaccine for persons > 12 months of age who are susceptible to varicella infection (non-immune). Children 12 months of age to 12 years of age should receive one 0.5 ml dose of vaccine. Persons > 13 years of age should receive two 0.5 ml doses at least 4 weeks (28 days) apart. Currently, it is not known whether booster doses will be required after primary vaccination but the data suggest it will provide lifetime immunity.

This vaccine does provide complete protection against chickenpox in 90-95% of those vaccinated. The remaining 5-10% of individuals experience less severe disease and a reduced risk of complications. It also decreases the risk of shingles later on.

Varicella vaccine is very safe. Reactions are generally mild and include injection site reactions (20%) such as pain, redness, swelling and rash, low-grade fever (15%) and a rash with 10-15 spots (3-5%). As is the case with all vaccines, there are specific contraindications and precautions that the health care provider must be aware of prior to administering the varicella vaccine ie. do not give if the child is immunocompromised.

Varicella vaccine (Varivax II) can be purchased at a pharmacy with a doctor's prescription and the average cost of 1 dose is \$82-\$100.

Pneumococcal conjugate vaccine: (PCV7)

Streptococcus pneumoniae (pneumococcus) is the leading cause of serious bacterial infections in Canadian children. In Canada, *s. pneumoniae* is

responsible for approximately 65 cases of meningitis, 700 cases of blood stream infection and an average of 15 deaths annually in children < 5 years of age. Children <5 and especially those <2 years of age are at the highest risk of invasive disease. The annual incidence rate for serious pneumococcal disease in all age groups is 11-17 per 100,000 population. In comparison, the annual incidence rate for children <5 increases to 35-64 per 100,000 population and for children <2 the rate is 60-110. Streptococcus pneumoniae is also responsible for a large number of non-invasive respiratory infections and is responsible for causing up to 70% of community-acquired bacterial pneumonia.

In June 2001, a new pneumococcal conjugated vaccine (PCV7) was licensed for use in Canada. This vaccine, known as Prevnar, is the only vaccine currently available to immunize infants and children from the ages of six weeks to two years against pneumococcal disease. This vaccine can also be given to older children, up to nine years of age. Other pneumococcal vaccines (polysaccharides) are available but cannot be used in children <2 years of age and are not as effective in preventing disease in children between the ages of 2 and 5. NACI recommends that conjugated pneumococcal vaccine should be given to all children < 23 months of age and to children 24 to 59 months of age that are at high risk of invasive pneumococcal disease. They also recommend that the vaccine should be considered for all children 24-59 months of age, especially those under 3 years of age and those attending daycare. Refer to Table 4 below for the dosing schedule of previously unvaccinated healthy children. High risk children often need to follow a different schedule.

Table 4

Recommended heptavalent pneumococcal conjugate vaccine (PCV7) schedule in previously unvaccinated healthy children - Canada

Age at first dose	Primary series	Booster dose ^b
2-6 months of age	Three doses, 8 weeks apart ^a	One dose at 12 to 15 months of age
7-11 months of age	Two doses,	One dose at 12-15

	8 weeks apart ^a	months of age
12-23 months of age	Two doses, 8 weeks apart	None
>24 months of age	One dose	None
^a - For children vaccinated at < 1 year of age, the minimum interval between doses is 4 weeks. ^b - Booster doses to be given at least 6-8 weeks after the final dose of the primary series.		

There are about 90 strains of pneumococcal bacteria and the conjugated pneumococcal vaccine provides protection against seven of the most common strains in children. This vaccine will prevent approximately 90% of all invasive pneumococcal disease.

The most frequently reported adverse reactions during the first 48 hours following vaccination include redness (10-14%), swelling (10-12%) and tenderness (15-23%) at the injection site. The injection site reactions are usually transient and resolve on their own. Acetaminophen can be administered if there is pain, irritability or fever associated with the vaccination.

Pneumococcal conjugate vaccine (Pevnar) can be purchased at a pharmacy with a doctor's prescription. The average cost of 1 dose of the vaccine is \$95-\$110.

Meningococcal conjugate vaccine: (Men C-conjugate)

Neisseria meningitidis is a bacteria that causes meningitis and blood stream infections. It is quite rare with an overall incidence rate of approximately one per 100,000 population annually. The greatest burden of disease is in children less than 5 years of age with a peak incidence at 6 to 24 months:

There are 5 types of Neisseria meningitidis that account for almost all cases of invasive meningococcal disease caused by this organism in Canada. These 5 serogroups are A, B, C, Y and W135. In Canada, the specific serogroup differs

by region, time and age. There are periods of increased activity every 10 years and it is most common in the winter months. Currently, serogroups B and C are the most common, however Y is increasing in Ontario. Serogroup C is most responsible for outbreaks and occurs in older children.

Over the past years, there have been vaccines available (polysaccharides) that provide some protection against serogroups A, C, Y and W135 but they do not work at all in infants and very young children and only provide a short duration of protection in older children. There is still no vaccine for protection against serogroup B. In 2001, a new conjugated meningococcal vaccine that protects against serogroup C was licensed in Canada (Men C-conjugate). This vaccine is unique in that it works well from early infancy onward and demonstrates good antibody levels.

NACI recommends that Men C-conjugate vaccine be given to the following children:

- All infants as part of their primary series to prevent the peak of disease in the first 2 years of life.
- All children 1-4 years of age
- Adolescents/young adults to prevent the second peak of disease
- Should be considered for all children between 5 years of age but who have not reached adolescence (they are at lower risk than the other groups above).

This vaccine can be given at the same time as other routine infant immunizations at 2, 4 and 6 months of age (three doses are required after at least a 4 week interval between doses). The vaccine should always be administered in a separate site with a different syringe. Infants 4-11 months of age who have not previously received the vaccine should be immunized with 2 doses given at least 4 weeks apart. A single dose of the vaccine is all that is required for the other age groups referred to in NACI's recommendations.

There are also separate recommendations and dosing schedules for high risk groups, people that have been in direct contact with meningococcal disease and during meningococcal outbreak situations.

It is important to remember that the new Men C-conjugate vaccine will not protect against meningococcal diseases caused by any other type of meningococcal serogroup. This vaccine provides protection against meningococcal serogroup C invasive disease and studies demonstrate that this protection lasts for at least 5 years after primary immunization. Revaccination with this vaccine after the primary series is complete is not thought to be necessary at this time but this recommendation may be revised in the future.

No serious adverse events have been documented with this vaccine. The most frequently reported local reactions are pain, swelling and redness at the injection site. These are normally mild and resolve within 24-72 hours following vaccination. General symptoms include fever, irritability and drowsiness but are usually mild and resolve spontaneously.

Meningococcal conjugate vaccine (Men C-conjugate/Menjugate) can be purchased at a pharmacy with a doctor's prescription. The average cost of a single dose of this vaccine is \$120-\$140.

For further information about immunizations, please see the resources suggested in the immunization article in the last newsletter.

Addendum: Since this article was printed, the National Advisory Committee on Immunization (NACI) have published new guidelines, incorporating these three immunizations in the schedule for routine vaccination of children. Information on this can be found at on the NACI website at www.hc-sc.gc.ca/pphb-dgspssp/dird-dimr/index.html

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