



**Varicella**  
**Information for Health Care Providers**  
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## **1. What is the program change?**

Starting January 1, 2012 the schedule changes will include:

- 2nd dose of varicella vaccine provided at school entry (4-6 years of age)
- The second dose of MMR, currently provided at 18 months of age, will be moved to school entry (4-6 years)
- These vaccines will be provided as a combined MMRV vaccine, which will not be inventoried until approximately January 2015.

For the next 3 years, MMR will not be offered routinely at 18 months of age. Children who have already received MMR at 18 months will be offered varicella vaccine at school entry. Children who move to the province and have not received MMR vaccine in the interim should be offered MMR and V separately.

## **2. What is the rationale for moving to a 2 dose varicella schedule?**

NACI reports that a second dose has been projected to decrease varicella cases by 22%. Both primary and secondary vaccine failure contribute to “breakthrough” varicella disease (also called “vaccine-modified disease”) in immunized individuals following the first dose of varicella vaccine.

Primary vaccine failure or failure to mount a protective immune response following vaccination occurs in 3 - 24% of individuals depending on the type of antibody measured. Secondary vaccine failure, or waning immunity is seen as well, with time since vaccination as a risk factor for breakthrough disease. The annual rates of breakthrough disease in US studies increased from 1.6 cases /1000 person years one year after vaccination to 9 cases/1000 person years at five years after vaccination, and 58.2 cases/1000 person years at nine years after vaccination.

## **3. Who is eligible for a second dose of varicella?**

Starting January 1, 2012, children 4-6 years of age are eligible for a second dose of varicella vaccine.

## **4. If the target population is 4-6 years at school entry, what happens to children who were already immunized prior to enrollment in school? Are we expected to call them back?**

Children who have already received their school entry vaccine, and are younger than their 7<sup>th</sup> birthday, should be offered varicella vaccine on an opportunistic basis. Children 4-6 years are considered eligible for a 2nd dose of varicella.

### **5. What is the estimated effectiveness and duration of protection for a 2 dose varicella vaccine schedule?**

Kuter et al. (2004) report 10 year vaccine effectiveness of 98.3% in children vaccinated with 2 doses, three months apart. There are currently no clinical studies assessing the long-term epidemiological outcome of other dosing intervals (e.g. at 12 months and 4 to 6 years).

However, expert opinion of the US Advisory Committee on Immunization Practice and Canada's NACI are supportive of providing a second dose of varicella vaccine at 4 to 6 years of age, which will boost waning immunity. This schedule may provide better immunity lasting into the adolescent years than giving the second dose of varicella in the second year of life.

### **6. Why are we not using MMRV at 12 months of age?**

The CD policy committee reviewed the option of using MMRV at 12 months of age and concluded that separate MMR and V vaccines are preferable because MMRV is associated with an excess risk of febrile seizures of about 1/ 2200 recipients in that age group.

### **7. Why do we not use the 18 month immunization appointment for the second dose of varicella vaccine?**

As noted, the second dose at school entry may provide immunity lasting into adolescent years. Cost effectiveness based on mathematical modeling supports providing the second dose of varicella prior to school entry as a preferential strategy to 18 months. This is also deemed feasible by BCIC as the current 4-6 year recommended vaccine schedule has only 1 injection.

### **8. What about adverse events with a second dose of varicella vaccine?**

In young children given two doses 6 weeks apart, swelling was reported very commonly (i.e. in more than 10% of recipients) after the second dose. A higher incidence of pain, redness and swelling was also reported after the second dose in children less than 13 years of age, compared to the first dose.

### **9. What is the incidence of varicella-like rash post second dose of vaccine?**

This has not been determined for the population to be vaccinated in this program. However, all adverse events are less common after the second dose of univalent varicella vaccine in individuals  $\geq 13$  years old, and in select immunocompromised children in whom two-dose regimens were studied. In the population studied, the incidence of varicella-like rash post second dose of vaccine dropped from 5% after the first dose to 1% following the second dose.

**10. What about children who have already had breakthrough varicella disease?**

NACI states that children who have received a single dose of varicella vaccine and have laboratory-confirmed breakthrough disease do not require a second dose of a varicella-containing vaccine. It is expected that breakthrough disease will seldom be laboratory confirmed. Children with unconfirmed breakthrough varicella should receive a second varicella vaccine dose.

**11. With the change to the routine schedule, children will not be receiving a second dose of MMR or varicella vaccine until school entry. Does this leave them at risk for disease?**

In Canada, some provinces have routinely provided a second MMR at school entry (see <http://www.phac-aspc.gc.ca/im/ptimprog-progimpt/table-1-eng.php>). There is no difference in the general epidemiology of measles in these provinces, compared to provinces where a second dose of MMR has been given at 18 months of age. BC and Quebec both have provided a second dose of MMR at 18 months, yet BC had a measles outbreak in 2010 and Quebec had a much larger measles outbreak in 2011. Either schedule of second dose MMR is acceptable, but maintenance of high immunization rates is the key factor related to population level protection. Breakthrough varicella disease does occur, but the risk of this increases with a longer time since receipt of first dose of vaccine. The children most at risk of disease are those who are not immunized.

**12. What do we say to the parents who want their older child or adolescent to have a second dose of varicella vaccine?**

The funding for second dose varicella vaccine is limited at this time to providing this dose at school entry, 4 -6 years of age. Advise parents that the National Advisory Committee on Immunization and the Canadian Pediatric Society have recommended a two-dose primary varicella schedule for children under 13 years of age. A second dose may be of benefit for older children who have received a single dose of vaccine in the past. Parents of these children may purchase a second dose.

**13. Is lab testing after 1 dose of varicella vaccine useful in determining the need for a second dose?**

No. Laboratory testing is not recommended. Commercially available varicella antibody tests do not have sufficient sensitivity to detect antibody after vaccination.

#### **14. What is the risk of shingles after varicella vaccination?**

The varicella zoster virus stays in the body after a person has chickenpox. It may reactivate at a later time and manifest as shingles (herpes zoster). Risk of shingles relates to increasing age, and immune system depression from disease or treatment. The lifetime risk of having shingles after wild-type varicella disease is estimated to be 15% -20%. The vaccine virus can also reactivate and cause shingles. The reactivation rate for shingles in vaccinated individuals appears to be less frequent, and the disease less severe than following natural infection. The long term effect of varicella vaccination on the incidence of shingles is unknown, and will be observed over a period of time.

#### **References:**

Kuter et al. (2004), Ten year follow-up of healthy children who received one or two injections of varicella vaccine. *Pediatric Infectious Diseases Journal*, 23, 132-137.

National Advisory Committee on Immunization. (2010). Statement on measles-mumps-rubella-varicella vaccine. *Canada Communicable Disease Report Vol. 36 (ACS-9)*.

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