



MMR VACCINATION: QUESTIONS AND ANSWERS

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The following questions and answers are intended as a resource when providing information to parents. Furthermore, the National Board of Health has published material concerning the Danish childhood vaccination programme on www.sst.dk (in Danish language).

Why is the first MMR vaccination given at the age of 15 months?

The MMR vaccine is given at the age of 15 months to ensure that the effect is not inhibited by the maternal antibodies. The first 6-12 months following birth, the infant is protected by antibodies to measles, mumps and rubella which are transmitted from the mother during the pregnancy. If the MMR vaccine is given prematurely, these antibodies may render the vaccine ineffective.

Why is the second MMR vaccination not given until the age of 12 years?

In 1987, when the vaccine was introduced in Denmark, the duration of rubella coverage was uncertain; this is particularly important in connection with pregnancy. The vaccine is now known to provide prolonged protection, and most countries consequently administer MMR 2 to pre-school-aged children. This is also being considered in Denmark.

Which interval is required between two MMR vaccinations?

An interval of at least four weeks should pass between the two MMR vaccinations. Any MMR vaccines given before the age of 12 months are considered ineffective; the child should therefore be revaccinated at the age of 15 months and subsequently no later than at the age of 12 years, as recommended by the childhood vaccination programme.

How early may infants be MMR vaccinated?

In connection with outbreaks or journeys to areas where measles occur, infants may be vaccinated from the age of 9 months. If the infant is vaccinated before the age of 12 months, another two vaccines should be given, as recommended by the childhood vaccination programme.

Why two MMR vaccinations?

The second vaccination is primarily given to protect those who have not formed protective antibodies after the first vaccination, but it also increases antibody formation in the already protected persons.

How should the MMR vaccine be administered?

Subcutaneous vaccination is recommended. However, limited data seems to indicate that intramuscular administration also leads to sufficient formation of protective antibodies.

May the MMR vaccine be given in conjunction with other vaccines?

Yes, the MMR vaccine may be given in conjunction with other vaccines, but it should be administered in separate syringes and at separate injection sites. If the vaccines are not administered simultaneously, a four-week interval should separate MMR vaccine administration from other live vaccines.

Why should everyone receive MMR vaccination?

The objective of the childhood vaccination programme is to protect both the individual and the population at large. When more persons are vaccinated, fewer remain to transmit the infection. A small number of unvaccinated persons will be protected if only a sufficiently large proportion is vaccinated, as the virus will not be able to circulate in the population. This phenomenon is known as "herd immunity".

Why should everyone receive the MMR vaccination when only boys may become sterile from mumps and only pregnant women need protection against rubella?

If only half the population were vaccinated, the diseases would circulate in the other half. As vaccine coverage is not 100%, a limited share of the population would be unprotected; some boys would then be susceptible to mumps and some pregnant women to rubella.

Is it acceptable to delay the first vaccination until the child is older?

Delaying the vaccination will expose the child during a greater part of childhood, thus increasing the risk of infection with one of the three diseases. The measles, in particular, entails the risk of serious illness.

How effective is the MMR vaccine?

After one vaccination, antibodies protecting against measles and rubella are formed in about 95% of vaccinees, while the corresponding number for mumps is about 90%. After two vaccinations, 95% of vaccinees achieve life-long protection against all three diseases.

Should unvaccinated persons above the age of 18 years receive MMR vaccination?

Unvaccinated persons above the age of 18 years who have not been infected with any of the three diseases are recommended a minimum of one MMR vaccination. This is recommended in particular for persons born 1975-84. Vaccination is free of charge for anyone under the age of 18, and two MMR vaccinations are recommended for this group. Persons born in 1985 or later have been offered two MMR vaccinations in connection with the childhood vaccination programme. Women of child-bearing age who have not received MMR vaccination are offered rubella vaccination free of charge. This vaccination may be administered as an MMR vaccination.

What does the vaccine contain?

The vaccine contains live attenuated measles, mumps and rubella virus. In addition, the vaccine contains a number of excipients and the antibiotic neomycin.

Would it not be better to vaccinate against one disease at a time?

No, the evidence does not suggest that it would be better to vaccinate against each disease individually because the immune system can easily form protective antibodies against all three diseases simultaneously. Furthermore, studies have shown that one combined MMR vaccination entails fewer adverse effects than separate vaccinations for each of the three diseases.

May breast-fed children be MMR vaccinated?

Yes, antibodies in the breast milk do not affect the effect of the MMR vaccination; consequently, the child will form protective antibodies.

May the MMR vaccine be given to lactating women?

Caution should be exercised if the MMR vaccine is given to lactating women. Attenuated rubella virus may be transmitted to breast milk and secreted to breast-feeding children. However, severe disease has not been found in children in such cases.

What should I do when it is uncertain whether the child has previously been MMR vaccinated?

When the vaccination status is uncertain, it is recommended to give

the child two vaccines at an interval of at least one month. In case the child has formed antibodies after a previous vaccination, these will simply neutralise the vaccine.

Is it possible to give half the vaccine dose to avoid adverse events in e.g. a small infant?

No, the full dose must always be given to achieve sufficient protection. A reduced dose entails considerable risk of rendering the vaccination completely ineffective.

Is it necessary to proceed with MMR 2 if the child presented with fever and rash after MMR 1?

Yes, the child must also be given the MMR 2 vaccination as there is no way of establishing which component of the vaccine, if any, caused the symptoms. Furthermore, studies have demonstrated that the risk of adverse events in connection with MMR 2 is not increased in cases where the child had fever or rash in connection after MMR 1.

Which are the most commonly occurring adverse events?

The most common adverse events are mild and harmless. Fever occurs in 5-12% of cases, most frequently after 9-10 days, and typically lasts 1-2 days. Rash occurs in approx. 5% of cases, most frequently after 7-10 days, and may persist for 1-3 days.

Is a child infectious if it gets a fever or rash after the MMR vaccination?

No, vaccinated children are not infectious, even if they run a fever, develop a rash or other symptoms; this is also true e.g. in cases with immunodepressed siblings.

Can MMR vaccination cause autism?

No, it should now be regarded as sufficiently demonstrated that this is not the case. Both clinical and major epidemiological studies in England, Finland, the USA and Denmark, among others, clearly disprove any association between MMR vaccination and the development of autism.

May children with egg allergy be MMR vaccinated?

Yes, such children may be MMR vaccinated. Studies have demonstrated that children with known egg allergy who are given the MMR vaccination do not experience any severe allergic reactions. However, such children should be vaccinated at a paediatric ward without a pre-

ceding prick test, EPI-NEWS 35/99.

May epileptic children be MMR vaccinated?

Yes, epilepsy in the child or among the closest relatives is not an impediment to giving the MMR vaccine. Nevertheless, it is essential that the condition be stable and fully investigated before the vaccine is given.

Does MMR vaccination entail an increased risk of allergy?

No association between the MMR vaccine and the risk of developing allergic diseases has been demonstrated.

Does inflammation of the brain occur after MMR vaccination?

At present, it has not been possible to exclude that inflammation of the brain (encephalitis) may, in rare cases, occur after MMR vaccination. So-called post-infectious encephalitis has been reported in 0.4-1 per 1,000,000 vaccinees. This frequency is below the encephalitis incidence of unknown cause in the unvaccinated background population. No cases of encephalitis have been found in persons with normally functioning immune systems. If the vaccine is capable of causing encephalitis, the frequency is 1,000 times inferior to that of the naturally occurring measles infection, where encephalitis occurs in one per 1,000-2,000 children.

Can the mumps virus cause inflammation of the testicles and possibly sterility in boys?

A limited number of possible cases of inflammation of the testicles have been reported after MMR vaccination, but considerably fewer cases than are associated with mumps.

Can the MMR vaccine cause blood platelet deficiency?

Yes, non-life-threatening blood platelet deficiency (Idiopathic Thrombocytopenic Purpura) may occur after MMR vaccination, but it is very rare. This is probably caused by the measles component; however, the risk is higher in measles patients, where blood platelet deficiency occurs in approx. 3 per 10,000 patients.

Does the MMR vaccine degrade the immune system?

No, on the contrary, the vaccine activates the immune system of the body enabling protection of the child against the three diseases as early as possible.

May the MMR vaccine be given to pregnant women?

No, pregnancy should be excluded before vaccination. As a precautionary measure, it is recommended that women avoid becoming pregnant for three months following an MMR vaccination.

What is the risk if a pregnant woman is vaccinated inadvertently?

No congenital malformation has been observed that may be ascribed to MMR vaccination during pregnancy. Consequently, there is no indication for induced abortion in such cases.

How long after a blood transfusion or administration of human immunoglobulin may MMR vaccination be given?

As the added antibodies will impede the vaccine from taking effect, vaccination should be given at least three months after any blood or plasma transfusion or administration of human immunoglobulin.

Why do some persons become infected with e.g. measles in spite of having been MMR vaccinated?

A limited number of persons do not form protective antibodies after the MMR vaccination and are therefore susceptible to infection. After one vaccination, antibodies protecting against measles and rubella are formed in approx. 95% of vaccinees while the corresponding number for mumps is at least approx. 90%. After two vaccinations, the protection against all three diseases is considered to reach at least 95% and immunity is considered life-long.

Do measles, mumps and rubella occur in Denmark?

As a consequence of the MMR vaccination, very few cases of measles, mumps and rubella currently occur in Denmark. Measles virus is probably the most highly infectious virus known and infection during stays abroad is presumably the major source of measles infection in Denmark at present; this comprises a risk of outbreaks among unvaccinated persons, EPI-NEWS 5/07. (A.H. Christiansen, S. Glismann, Department of Epidemiology)

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The tables normally found on page two of EPI-NEWS have this week been published at www.ssi.dk