

# Mumps vaccines for Australians

This fact sheet provides information for immunisation providers on mumps disease and mumps vaccination in Australia.

## Disease and epidemiology

- Mumps is an acute viral illness spread via respiratory droplets and direct contact with saliva or possibly urine of an infected person.
- One third of infected people do not show any symptoms, but these people can still spread the disease.
- Mumps infection is now most common in young and middle-aged adults.
- Infection in adults can lead to more serious complications, such as meningitis, orchitis and deafness. If mumps infection occurs during the first trimester of pregnancy, it may cause spontaneous abortion.
- The majority of mumps cases develop the characteristic swelling of the salivary, or parotid, glands on one or both sides of the face.

## Who should be vaccinated

- All individuals are recommended to receive two lifetime doses of mumps-containing vaccine.
- Currently, the measles-mumps-rubella (MMR) vaccine is scheduled for all children at 12 months of age and the measles-mumps-rubella-varicella (MMRV) vaccine at 18 months of age.
- People born during or since 1966 who are unvaccinated or only received one lifetime dose (as recommended before 1992) are recommended to receive catch-up vaccination.

## Vaccines

- MMR and MMRV vaccines contain live-attenuated measles, mumps and rubella viruses, with the MMRV vaccine also containing live-attenuated varicella-zoster virus. Monovalent mumps vaccine is not available in Australia.
- Mumps-containing vaccines are contraindicated in pregnant women and people who are immunocompromised.

## The disease

Mumps is a paramyxovirus from the genus *Rubulavirus* that causes severe illness. The mumps virus is spread via respiratory droplets, aerosols or direct contact with saliva or urine.<sup>1</sup> Mumps has an incubation period of 12–25 days (most commonly 16–18 days) before non-specific symptoms commence.<sup>1,2</sup> Mumps is highly infectious and individuals with mumps are infectious for 7 days before the disease onset and 9 days afterwards.<sup>1</sup> This is of particular concern as this allows mumps to spread before individuals are aware of their infection. In countries where there is large-scale immunisation against mumps, the incidence of the disease has dramatically decreased.

## Clinical features

One third of individuals infected with mumps do not show any symptoms. Symptomatic individuals may have non-specific symptoms such as headache, fever, fatigue, muscle pain and lack of appetite.<sup>2</sup> This is then followed by the characteristic swelling of the salivary, or parotid, glands on one or both sides of the face in majority of the cases.<sup>2,3</sup> Mumps can cause orchitis, or infection of testicles, in a third of infected males. Other glands and organs are rarely affected, but complications such as pancreatitis, oophoritis, hepatitis, myocarditis, thyroiditis and mastitis may develop.<sup>2,4</sup>

## Epidemiology

The national notification rate for mumps in Australia was <1 per 100,000 population between 2009 and 2014.<sup>5-8</sup> This rate increased from 2.7 per 100,000 population in 2015 to 3.4 per 100,000 population in 2017, with an increased number of cases reported in adolescents.<sup>9,10</sup> Despite high immunisation rates in Australia, there are still multiple mumps outbreaks mainly in Aboriginal and Torres Strait Islander communities.<sup>11-13</sup> In the Northern Territory, 129 cases of mumps were recorded in 2016, with 91% of cases occurring in Aboriginal and Torres Strait Islander people in the Alice Springs, Barkly and Katherine regions.<sup>13</sup> Around half of these cases were fully vaccinated and about a third were partially vaccinated.

## Vaccine

Mumps vaccine is administered as either MMR or MMRV vaccine in Australia. Both of these vaccines are available for free under the National Immunisation Program (NIP). Free catch-up vaccinations are also available for individuals aged <20 years in the Australian Capital Territory, New South Wales, the Northern Territory, Tasmania, Victoria and Western Australia.

### Combination vaccines in Australia

Measles-mumps-rubella (MMR)	Measles-mumps-rubella-varicella (MMRV)
M-M-R II (Merck Sharp & Dohme) Priorix (GlaxoSmithKline Australia)	ProQuad (Merck Sharp & Dohme) Priorix-tetra (GlaxoSmithKline Australia)

Vaccines within the same category are interchangeable. For more information on vaccine ingredients and vaccine administration, refer to the [Mumps disease chapter in the Australian Immunisation Handbook](#).

## Immunogenicity and effectiveness

Mumps vaccine is highly immunogenic, with 95% of people having evidence of protection after the first dose and up to 100% after the second dose, as proven by clinical effectiveness studies.<sup>2,14-18</sup> Individuals who have received 2 doses of mumps-containing vaccine are better protected than individuals who have received a single dose. However, mumps outbreaks have been recently reported in people (particularly young adults who received the vaccination over 10 years ago) who have received 2 doses.<sup>19-22</sup>

# Recommendations

## People born in or after 1966

### Children

All children are recommended two life-time doses of mumps-containing vaccine. Although it is not routinely recommended for infants <12 months of age to receive the MMR vaccine, children as young as 6 months can receive it in certain circumstances (refer to the [Measles chapter in the Australian Immunisation Handbook](#)). If early vaccination occurs, a child still requires the two recommended vaccine doses – first at 12 months of age and the second at 18 months of age. MMRV vaccine is not recommended as the first dose of mumps-containing vaccine in children aged <4 years because of a small but increased risk of fever and febrile seizures (refer to Vaccine safety section).<sup>23,24</sup>

### Adolescents and adults

All adolescents and adults born during or since 1966 are recommended to have received 2 doses of mumps-containing vaccine and have: either documented evidence of 2 doses of mumps-containing vaccine given at least 4 weeks apart at  $\geq 12$  months of age or serological evidence of immunity.

### People born in or before 1965

Vaccination is not generally required for people born in or before 1965 as they are likely to have had natural infection and thus immunity. Serological testing for mumps immunity can be considered if their history of natural immunity is uncertain or if it is uncertain if they have received 2 doses of mumps-containing vaccine. Alternatively, these people can be offered the MMR vaccine without serological testing as there is no known increase in adverse events from vaccinating individuals with pre-existing immunity.

### Catch-up

People who have received only a single dose of the vaccine or have uncertain vaccination history may need catch-up. Health professionals should plan and document a catch-up schedule for these people and should discuss this schedule with the person requiring vaccination or their parent/carer.

Where possible, for individuals requiring catch-up doses of mumps-containing vaccine, it is preferable to vaccinate without serology testing, as this minimises missed opportunities to vaccinate and the need for follow-up visits. Further MMR vaccination in individuals who have previously been vaccinated or who are already immune is safe. Serology testing may be appropriate where the likelihood of previous immunity is high, for example, in people born in Australia prior to 1966 or born after the mid-1990s when 2-dose vaccine coverage was relatively high.

Free catch-up vaccination is available under the NIP for individuals up to 19 years of age and for refugees and humanitarian entrants aged  $\geq 20$  years. In addition, some Australian states/territories fund catch-up vaccination for people  $\geq 20$  years. Check your local state or territory health department for details. Refer to the [Catch-up section of the Australian Immunisation Handbook for more details](#).

## Contraindications to vaccination

Contraindications	Details
Anaphylaxis to vaccine components	MMR and MMRV vaccines are contraindicated in people who have had anaphylaxis after a previous dose of any MMR-containing vaccine or anaphylaxis after any component of an MMR-containing vaccine.
Pregnant women	MMR-containing vaccines are contraindicated in pregnant women and thus vaccinated women should avoid pregnancy for 28 days after vaccination. <sup>23</sup>
People who are immunocompromised (See the Vaccination for people who are immunocompromised section in the Australian Immunisation Handbook for more information).	MMR-containing vaccines contain live attenuated viruses and are contraindicated in people who are immunocompromised. MMR-containing vaccines are also contraindicated in people who are receiving high-dose systemic immunosuppressive therapy, such as chemotherapy, radiation therapy or oral corticosteroids.

## Precautions

### Mumps vaccines and immunoglobulin/blood products

Antibodies present in immunoglobulins or blood products can inhibit the immune response to mumps vaccines. There are no issues with **washed** red blood cell transfusions or giving anti-D immunoglobulin. However, other blood or immunoglobulin products should be given at least 3 weeks after mumps vaccination, if possible, to allow development of an appropriate vaccine response.

If a blood or immunoglobulin product is necessary immediately or has been given before the individual received mumps-containing vaccine, vaccination will then need to be delayed by 3–11 months after administration of the immunoglobulin-containing blood product, depending on the blood product and the dose given - refer to the [Australian Immunisation Handbook](#).

### People with HIV

Children with an age-specific CD4+ count of  $\geq 15\%$  and adults with a CD4+ cell count  $\geq 200$  cells per microliter ( $\mu\text{L}$ ) can be vaccinated with MMR vaccine. Separate MMR vaccine and monovalent varicella vaccine should be used instead of combined MMRV vaccine because of a lack of safety data in this population.

### Low-dose corticosteroid therapy

Vaccination may be appropriate in people undergoing low-dose corticosteroid therapy. Refer to '[Recommended timing of live vaccine doses in adults and children taking corticosteroids](#)' table in the Australian Immunisation Handbook. Vaccination can occur 4 weeks after cessation of high-dose corticosteroid therapy.

### Individuals with thrombocytopenia

Thrombocytopenia can be a rare complication of MMR vaccination. In those with immune thrombocytopenic purpura (ITP), serology may be used to determine the need for a 2nd dose.

### Household contacts of immunocompromised individuals

There is no risk of transmission of mumps vaccine virus from vaccinated individuals to others and so it is safe to vaccinate these individuals.

## Vaccine safety

Adverse events can occur after immunisation with mumps-containing vaccine, many of which are similar to those that may occur after other routine childhood vaccines. These can include local reactions (redness, swelling, pain and tenderness) and systemic reactions (fever, irritability). Refer to [adverse events after immunisation](#) in the Australian Immunisation Handbook.

As MMR and MMRV vaccines are live vaccines, some adverse reactions can occur later than those with inactivated vaccines, corresponding to the peak period of live virus replication. Peak rates of high fever  $\geq 39.4\text{C}$  (10–15% of recipients) and rash (~5%) occur between 7 and 10 days (range 5–12 days) after vaccination. An Australian study showed that febrile seizures occurred at a rate of 1 case per 4,000 doses in children aged 11–23 months after the 1st MMR vaccine dose.<sup>25</sup>

The rate of fever and febrile convulsion when MMRV vaccine was given as the 1st dose of mumps-containing vaccine was twice the rate when MMR and varicella vaccines were given separately.<sup>26</sup> Therefore MMRV vaccine is recommended to be used only as the 2nd dose of mumps-containing vaccine in Australia. A US study showed there was no increase in MMRV vaccine-related seizures compared with those when MMR and varicella vaccines were given separately at 4–6 years of age.<sup>27</sup> An Australian study has confirmed these findings in the 11–23-month age group, showing no increase in febrile seizures after administration of MMRV vaccine as the 2nd mumps-containing vaccine dose.<sup>28</sup>

Thrombocytopenia can occur in 3–5 per 100,000 doses of MMR vaccine, and anaphylaxis is very rare (1 per 1.8–14.4 million doses).

Numerous well-designed studies have disproven a previously suggested link between MMR vaccines, inflammatory bowel disease and autism.<sup>18</sup> These have examined differences in MMR vaccine exposure in children with and without autism, both retrospectively<sup>29</sup> and prospectively,<sup>30,31</sup> comparing autism rates in large numbers of vaccinated and unvaccinated children. All studies have found no significant associations. In addition, ecological studies have found no relation between population MMR vaccination rates and autism rates, with one study instead finding autism rates increased even after a national MMR vaccination program was ceased<sup>32</sup> and vaccination coverage fell markedly. Further information on this topic is available from the NCIRS fact sheet on [MMR vaccine, inflammatory bowel disease and autism](#).

## Public health management of mumps cases

Mumps is a notifiable disease across all states and territories in Australia. State and territory public health services or local public health units can be contacted to provide advice and support about the public health management of mumps such as management of cases and those they have contacted.

## Useful links

- [Australian Immunisation Handbook – Mumps Disease chapter.](#)
- [National Immunisation Program Schedule](#)
- [MMR vaccination decision aid](#)
- [Talking about immunisation website](#)
- [AusVaxSafety](#)

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