# Other vaccine recommendations for older people

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**In addition to influenza, pneumococcal and herpes zoster vaccines, older people are recommended to have tetanus and pertussis booster vaccines and vaccines for special risk scenarios. A range of vaccines against other diseases with a high burden in older people are in the pipeline.**



## KEY POINTS

- Most tetanus cases and deaths are in older people.
- A tetanus booster vaccine is recommended for all adults at ages 50 years and 65 years if their last dose was more than 10 years previously; unvaccinated adults should receive a primary course plus boosters.
- Most older people are susceptible to pertussis, which can have severe consequences in this age group, as well as potentially infecting infants they contact.
- An opportune time for pertussis vaccination is at the time of tetanus vaccination, using the combined vaccine.
- Older travellers and healthcare workers should follow the same vaccine recommendations as younger people.

Several vaccines are recommended for older people in addition to the influenza, pneumococcal and herpes zoster vaccines already discussed in this Supplement.[1-3] For example, boosters of tetanus and pertussis vaccines are important in this age group. Further, older people in specific scenarios are at increased risk of vaccine-preventable diseases, and extra vaccines should be considered. These include older people with reduced immune function and travellers. Recommendations for these extra vaccines and specific risk groups are outlined here. Vaccines for older people in the development pipeline are also described.

## Tetanus

In Australia, 80% of tetanus notifications and 90% of tetanus deaths since 1980 have been in adults aged over 50 years.[4,5] In the US, 60% of tetanus cases occur in people aged over 60 years.[6] Despite tetanus being mainly seen in the older population, the number of deaths from this disease is very low.

Almost all adult cases of tetanus occur in people who never completed a primary childhood immunisation series. A history of immunisation from patients, families or medical charts may be an unreliable indicator of tetanus immunity. Thus, the main thrust of any adult tetanus vaccination policy should be to ensure that everyone receives a primary immunisation series and booster vaccinations.

Seroprevalence studies in the US have shown that more than half of adults lack antibody levels that are considered protective against tetanus and support the need to give primary courses and boosters, especially to those with tetanus-prone wounds.[7] Older people have a good response to a single dose of tetanus vaccine.[8]

The 2018 edition of the Australian Immunisation Handbook recommends a booster dose of tetanus-containing vaccine for all adults at 50 years and 65 years of age if their last dose was more than 10 years ago.[9] Unvaccinated adults should receive a primary course of three doses, followed by boosters 10 and 20 years later. Tetanus

MedicineToday 2019; 20(2 Suppl): 23-26

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**1. CASE STUDY: AN OLDER COUPLE ENQUIRING ABOUT PERTUSSIS VACCINATION**

*Lily, 67 years, and her husband Cheng, 70 years, have come to see you to discuss whooping cough vaccination. Lily will be flying to the UK in three weeks to be with their daughter who is expecting a baby, their first grandchild. Her daughter asked her to have a booster pertussis vaccination before coming. Cheng has a bad back and has decided not to go with Lily.*

***What do you advise Lily?***

You check your records and ask Lily whether she has had a pertussis booster in the past 10 years for any other reason (e.g. in combination with a tetanus booster vaccine). As she has not had a pertussis booster, you offer her the combined adult formulation of diphtheria, tetanus and pertussis vaccine (dTpa), advising that there is enough time before she travels for the vaccine to be effective.

You explain to her that pertussis in children in the first few months of life is very serious. Half the affected children are hospitalised, and about 1 to 2% of these die. About 70% of these children contract pertussis from a close family member, so a booster is very important. Infants need two to three vaccine doses for protection, so are not protected in their first four to six months of life unless they have received antibodies from their mother via the placenta.

You advise Lily that it is also important for her daughter to have a pertussis booster during the pregnancy. She should check that her daughter has had this.

***What do you advise Cheng?***

Although Cheng is not travelling, he should also have a booster pertussis vaccination. Recent data have highlighted the significance and seriousness of pertussis in older adults as well as in very young children. The incidence of disease is increasing in this group. The usual pertussis sequelae of a persistent three-month cough is significant in itself. In addition, complications requiring hospitalisation are also increasing, and there is also a small but real risk of mortality in older people with pertussis.

Past vaccination with an acellular pertussis vaccine provides protection for three to possibly 10 years and even past infection does not provide lifelong immunity. All people turning 65 years should have a pertussis booster if they have not had one in the past 10 years.

vaccine is available in combination with diphtheria vaccine (dT) or with diphtheria and pertussis vaccines (dTpa).[9] The latter differs from the childhood formulation (DTPa) as it contains smaller amounts of diphtheria and pertussis antigens.

## Pertussis

The protection provided by acellular pertussis vaccination wanes rapidly, and full protection lasts on average up to five years. Similarly, pertussis infection does not provide lifelong immunity. Most older people are susceptible to pertussis, and data increasingly show that infection can have severe consequences in this age group.[10] Recent evidence shows that pertussis-associated deaths occur in older people as well as the very young.[10] Because of the increase in morbidity associated with pertussis in older people, they are recommended to have a single booster dose of dTpa, which is the only adult pertussis vaccine available, if they have not received this vaccine in the past 10 years.[11-13]

Vaccination is also supported for older people who intend to have close contact with infants (younger than 6 months), to prevent pertussis transmission in the period before the infants are fully protected by direct immunisation (see the case study in Box 1 and Special risk scenarios, below). However, increasing vaccination of pregnant women may soon reduce this need.

An opportune time for pertussis vaccination is at the time of tetanus vaccination, using dTpa. Reviewing the pertussis vaccination status of all people when they turn 65 years of age will protect them and reduce circulation in the community.

## Meningococcus

Meningococcus (*Neisseria meningitidis*) strain W has emerged as the predominant meningococcus strain in Australia, surpassing strain B in 2016.[14,15] Strain W is a hypervirulent strain associated with a higher risk of invasive disease and mortality. In 2017, adults aged over 65 years accounted for 25% (24/94) of the total cases reported in Australia. Two meningococcal vaccines, a quadrivalent meningococcal conjugate vaccine covering strains A, C, W and Y and a meningococcal B vaccine, are available for adults through private prescription.

Meningococcal vaccination is recommended for adults with immunodeficiency, including those who have had a splenectomy and those with HIV infection, if they are a close contact of a person with meningococcal infection, and those taking the medication eculizumab.[16] It is not known whether patients taking other types of monoclonal antibodies are at increased risk of meningococcal disease. In 2017, the state of Victoria funded meningococcal vaccine for all gay and bisexual men and men who have sex with men, at any age.[17] In areas with regional outbreaks in any age group, vaccination against the prevalent strains should be offered to older people irrespective of additional risk factors.

## *Haemophilus influenzae*

Vaccination against *Haemophilus influenzae* type b (Hib) is recommended for infants, children and some people who are immunocompromised. This includes patients who have undergone splenectomy and were not vaccinated in infancy or were incompletely vaccinated, functional and autologous haematopoietic stem cell transplant recipients and all solid organ transplant recipients.[18]

## Special risk scenarios

### People with reduced immune function

Although older age itself is associated with a reduction in most immune functions, in some people other conditions further reduce immune competency. In people who are immunocompromised, vaccination with a live vaccine (e.g. the live attenuated herpes zoster vaccine) is less safe, and response to vaccination with most other vaccines is reduced.

The live attenuated herpes zoster vaccine can be safely given to about 97% of older people. This includes those using corticosteroids in the following categories: those taking oral prednisolone at a dose less than 20 mg for less than two weeks; those using inhaled or topical corticosteroids; and those taking corticosteroids as replacement therapy. More detailed recommendations on whether a person is immunocompromised to the extent that they should not receive this vaccine have been recently published.[19]

Recommendations on vaccination for people about to become immunocompromised (e.g. by elective splenectomy or by taking higher-dose immunosuppressants) can be broadly summarised as: check current vaccination status and give any outstanding vaccines. More detailed advice for people about to undergo splenectomy are available from Spleen Australia (https://spleen.org.au).[20]

### Grandparents and other older people exposed to children

Infants younger than 6 months, who are too young to have received a full course of pertussis vaccine, are at risk of being infected with pertussis, typically by an older relative such as a grandparent or great-grandparent. Pertussis vaccination should be offered to older people before contact with infants younger than 6 months. Increasing immunisation of pregnant women to protect their infants through passive immunity via the placenta may affect this recommendation.

No other additional vaccinations are recommended for older people in contact with younger people. Indeed, it is likely that protection works the other way – vaccination of younger people with conjugated pneumococcal vaccine and influenza vaccine protects older people through herd immunity.

### Older travellers

Older people should be offered the same travel vaccinations as those recommended for younger people for the countries they are to visit. This is particularly important as travel becomes easier and safer, and thus more often undertaken by older people. Individualised advice according to older people's medical conditions and degree of immunosuppression is recommended; more details are available in the Australian Immunisation Handbook.[21]

### Older healthcare workers

Increasingly, older people continue to work into their 60s and 70s, including in health care. Older healthcare workers should follow the same vaccination recommendations as their younger counterparts. This includes annual influenza vaccination. Influenza vaccine coverage of GPs is more than 70%, whereas coverage in hospital staff is less than 50%.[22,23]

### Regional issues

Healthcare practitioners should remain aware of regional outbreaks, and adjust vaccination recommendations accordingly. Similarly, in some tropical regions the usual seasonal variations in influenza are less apparent, and vaccination at other times may need to be considered, subject to vaccine availability.

## Vaccines in the development pipeline

Over the next few years, new vaccines for older people are likely to become available. These include more effective vaccines than those currently available (e.g. both a 15-serotype and a 20-serotype conjugate pneumococcal vaccine) and vaccines for infections not currently covered by vaccines (e.g. *Clostridium difficile*, *Pseudomonas aeruginosa* and *Staphylococcus aureus* infections and possibly even malaria).

In addition, a range of vaccines are in the development pipeline against viruses responsible for considerable morbidity and mortality among older people. These include cytomegalovirus and respiratory pathogens such as respiratory syncytial virus and human metapneumovirus (Box 2).[24-35]

Vaccines against noninfectious diseases may also become available in the future. For example, research is underway on antiamyloid vaccines to prevent or modify Alzheimer's disease.[36]

**2. SOME VACCINES FOR OLDER PEOPLE UNDER DEVELOPMENT**

**Cytomegalovirus vaccine**
Cytomegalovirus (CMV) is a herpes virus that enters latency after acute infection, causing lifelong persistent infection. It is transmitted via saliva, sexual secretions and transplantation. Almost all adults in low- and middle-income countries have been infected with CMV when young.[24] CMV is a major driver of cellular immune differentiation and seems to enhance immunosenescence.[24-26] It causes considerable morbidity among transplant recipients. Studies are underway of candidate CMV vaccines.[27-29]

**Respiratory syncytial virus vaccine**
Respiratory syncytial virus (RSV) causes an influenza-like illness.[30] Its impact in older people is similar to that of nonpandemic influenza, both in nursing homes and in the community.[31] Current treatment of RSV infection is mainly symptomatic, and prevention relies on infection control strategies such as handwashing and droplet precautions. Vaccines against RSV are in development.[31,32]

**Human metapneumovirus vaccine**
Human metapneumovirus (HMPV) is a frequent cause of lower respiratory tract infections in older people, as well as young children and people who are immunocompromised. In nursing homes, it can cause severe disease, equivalent to an influenza outbreak.[33] Antiviral drugs are ineffective against HMPV. Several vaccine candidates are under development, but have not yet been tested in humans.[34,35]

## Conclusion

Immunosenescence is a significant problem in older people that mandates offering them vaccines against a range of vaccine-preventable diseases. As well as influenza, pneumococcal and herpes zoster vaccines, booster vaccines against tetanus and pertussis are important in this age group.

A booster dose of tetanus-containing vaccine should be offered to all adults at

age 65 years if their last dose was more than 10 years ago. Reviewing pertussis vaccination status is also recommended for all people when they turn 65 years of age, as pertussis causes considerable morbidity and even mortality in older people. Those about to become grandparents should also be vaccinated. Older travellers and older people who are employed should follow the same vaccine recommendations as their younger counterparts. MT

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COMPETING INTERESTS: Associate Professor Woodward has received funds for sitting on advisory boards and participating in educational events for Seqirus, Sanofi, MSD and GlaxoSmithKline. Associate Professor Litt has received funds for sitting on advisory boards for Seqirus and GlaxoSmithKline and speaker's fees from Seqirus when providing educational updates on zoster vaccination for a range of healthcare providers.