

# Adult vaccination

## VACCINES FOR AUSTRALIAN ADULTS: INFORMATION FOR IMMUNISATION PROVIDERS

This fact sheet gives an overview of the vaccines provided for adults under the Australian National Immunisation Program and those recommended for adults in the 10th edition of *The Australian Immunisation Handbook*<sup>1</sup> available on the Immunise Australia website. The information in this fact sheet is summarised in a table which can be used as a stand-alone resource (available at [www.ncirs.edu.au/provider-resources/immunisation-schedules](http://www.ncirs.edu.au/provider-resources/immunisation-schedules)).

### Overview

- More vaccines are becoming available and recommended in *The Australian Immunisation Handbook* for use during adulthood.
- Adults may be recommended to receive vaccinations due to a range of factors which can increase their risk of disease, such as age, lifestyle behaviours or medical conditions. Some recommended vaccines are funded through the National Immunisation Program (NIP), state and territory programs or through the workplace, while others can be purchased privately by the individual.
- Immunisation providers play an important role in promoting vaccination during adulthood and should seize every opportunity to identify and offer vaccination to eligible individuals.
- Currently seasonal influenza vaccine, pneumococcal polysaccharide vaccine and zoster (shingles) vaccine are funded under the NIP.
- Zoster vaccine was introduced to the NIP in November 2016 for persons aged 70 years, with a catch-up program for those aged 71–79 years funded until October 2021. As it is a live attenuated vaccine, zoster vaccine is contraindicated in people who are immunocompromised.
- Influenza and pertussis vaccines are recommended for pregnant women. Pertussis vaccine is now recommended in the third trimester of every pregnancy, replacing postpartum vaccination. Immunisation in pregnancy provides optimal protection against pertussis for newborns.
- It is important that Aboriginal and Torres Strait Islander (Indigenous) status is noted during consultation as the indications for NIP-funded vaccines for Indigenous people are different to those for non-Indigenous people.
- Other vaccines (e.g. influenza, pneumococcal, diphtheria-tetanus-pertussis, measles-mumps-rubella and others) are recommended for adults in certain age and at-risk groups.

### Recording and reporting

- The Australian Childhood Immunisation Register (ACIR) was expanded to become an Australian Immunisation Register (AIR) in September 2016. The AIR aims to capture all NIP-funded and most privately purchased vaccines given to people of all ages. There are separate registers for HPV school-based vaccinations and Q fever vaccination.
- Adverse events following immunisation should be reported to the Therapeutic Goods Administration via the established mechanism in each state or territory. AusVaxSafety, a sentinel surveillance system, also actively monitors the safety of vaccines using SMS-feedback from recently vaccinated children and adults.

## Epidemiology

Hospitalisations and deaths due to vaccine-preventable diseases occur in adults. In the 4-year period between 2008 and 2011, the Australian Institute of Health and Welfare (AIHW) National Mortality Database recorded over 700 deaths in adults due to vaccine-preventable diseases, predominantly pneumococcus, influenza and herpes zoster.

- Elderly people suffer high rates of morbidity and mortality due to infectious diseases. Influenza, pneumococcal disease and herpes zoster have their highest mortality rates in older adults.<sup>2</sup>
- For some diseases, even though the illness is less severe in adults they can still transmit the infection to vulnerable groups.<sup>3</sup> For example, adult household contacts have been identified as the major source of pertussis infection in young infants (who are most at risk of hospitalisation and death due to pertussis). Evidence from studies of infant pertussis cases indicates that family members, particularly parents, are the source of infection in at least 50% of cases.<sup>3</sup>
- Reduced immunity in adults due to incomplete or missed childhood vaccine doses plays a role in the burden of disease. For example, measles disease outbreaks in countries without endemic measles, like Australia, have been linked to virus imported by non-immune young adult travellers.<sup>4,5</sup>
- Aboriginal and Torres Strait Islander (hereafter respectfully referred to as Indigenous) Australians have higher rates of morbidity and mortality due to vaccine-preventable diseases than non-Indigenous Australians. In young Indigenous adults, rates of invasive pneumococcal disease (IPD) are 12 times greater than in their non-Indigenous counterparts.<sup>6</sup>
- Certain lifestyle behaviours can put adults at increased risk of vaccine-preventable diseases. For example, at-risk behaviours such as injecting drug use are recorded in a large proportion of new hepatitis B cases notified in Australia.<sup>7</sup>

## What vaccines are recommended for adults?

### Routine vaccinations for all adults: NIP-funded Influenza

Yearly seasonal influenza vaccinations are recommended for any person  $\geq 6$  months of age who would like to be protected against influenza.

Influenza vaccination is funded under the NIP for:

- older persons ( $\geq 65$  years of age)
- pregnant women (see also [During and after pregnancy](#) below)

- any person  $\geq 6$  months of age with specific underlying medical conditions that put them at increased risk of severe influenza (see also [At-risk medical conditions](#) below)
- Indigenous Australians 6 months to  $< 5$  years and  $\geq 15$  years of age (independent of health status).

Details of the current seasonal influenza vaccination program, including details for the funded underlying medical conditions, are available on the Immunise Australia website

([www.immunise.health.gov.au/internet/immunise/publishing.nsf/Content/immunise-influenza](http://www.immunise.health.gov.au/internet/immunise/publishing.nsf/Content/immunise-influenza)).

Refer also to NCIRS fact sheets on [Influenza vaccines for Australians](#) and [Influenza vaccines – frequently asked questions](#).

### Pneumococcal disease

Two types of pneumococcal vaccine are available in Australia: a 13-valent **pneumococcal conjugate** vaccine (13vPCV) and a 23-valent **pneumococcal polysaccharide** vaccine (23vPPV).

Vaccination with 23vPPV is funded under the NIP for:

- Non-Indigenous adults  $\geq 65$  years of age
- Indigenous adults  $\geq 50$  years of age
- All adults who have a medical condition that increases their risk of IPD (as outlined in the *Handbook*).

All adults who have a medical condition(s) that puts them at the greatest risk of IPD are recommended to receive a dose of 13vPCV. HSCT recipients should receive 3 doses.

The potential introduction of 13vPCV to the NIP for adults is currently being evaluated.

### Zoster

A single dose of the live attenuated zoster vaccine, Zostavax<sup>®</sup>, is recommended for all adults aged  $\geq 60$  years who have not previously received a dose. This is because of the high disease burden<sup>8</sup> of herpes zoster and post-herpetic neuralgia and demonstrated vaccine efficacy<sup>9</sup> in this age group.

The vaccine is funded under the NIP for persons aged 70 years (since November 2016), with catch-up for those aged 71–79 years also funded until October 2021. Zoster vaccine is contraindicated in people who are immunocompromised.

The exact duration of vaccine efficacy is not known; however, protection following a single vaccine dose wanes with time. The need for revaccination has not yet been determined.

Zostavax<sup>®</sup> can be given at the same time as influenza and pneumococcal polysaccharide vaccines using separate syringes and injection sites.

Zoster and varicella vaccines cannot be used interchangeably. Zoster vaccine contains approximately 14 times the concentration of live attenuated varicella-zoster virus that is in the varicella (chickenpox) vaccine.

Refer also to NCIRS fact sheets on [Zoster vaccine for Australian adults](#) and [Zoster vaccine – frequently asked questions](#).

### **Routine vaccinations for all adults: Handbook recommended, non NIP-funded**

#### **Diphtheria, tetanus and pertussis (dT/dTpa)**

Diphtheria and tetanus vaccinations can be given as either diphtheria-tetanus (dT) formulation or, preferably, the adult formulation of the diphtheria-tetanus-acellular pertussis vaccine, dTpa (Boostrix<sup>®</sup> or Adacel<sup>®</sup>), which also provides immunity against pertussis.

A booster dose of a **tetanus-containing** vaccine is recommended for adults:

- ≥50 years of age who have not received a tetanus-containing vaccine in the previous 10 years (but have previously completed a primary course)
- with tetanus-prone wounds if more than 5 years has elapsed since a previous dose (tetanus immunoglobulin may also be required as outlined in the *Handbook*).

A single booster dose of a **pertussis-containing** vaccine is recommended for adults:

- ≥65 years of age who have not received a dose in the previous 10 years
- in close contact with infants <6 months of age, if more than 10 years has elapsed since the previous dose.

While some adults would have received multiple dT-containing vaccines in their lifetime, others may have not received any since childhood. Multiple vaccinations with dT-containing vaccines can result in local reactions at the site of injection but are generally safe.

Refer also to the NCIRS fact sheet on [Pertussis vaccines for Australians](#).

#### **Measles, mumps and rubella (MMR)**

For greatest protection against measles, mumps and rubella, adults who were born after 1966 should have received two doses of MMR vaccine as they lack natural immunity to measles, mumps and rubella.

There are a number of adults who are not immune or only partially immune to measles, mumps and rubella because they were not captured in the Australian Measles Control Campaign in the late 1990s and the subsequent Young Adults MMR program in 2001.<sup>10,11</sup>

Checking the measles, mumps and rubella vaccination status of adults is important, especially women of child-bearing age (see [During and after pregnancy](#)).

### **At-risk groups with specific vaccination recommendations**

#### **During and after pregnancy**

Except for pertussis and inactivated influenza vaccines, vaccination during pregnancy is not routinely recommended in Australia. Live viral vaccines, such as MMR and varicella, are contraindicated during pregnancy.

If a woman is planning pregnancy, it is advisable to review her vaccination history, in particular for hepatitis B, rubella and varicella. Immunity to rubella (and to varicella, if the woman has no clear history of vaccination or disease) should be established via serological screening before pregnancy, as outlined in the *Handbook*.

#### **Pertussis**

- Pertussis vaccination is recommended in the third trimester (optimally between 28 and 32 weeks) of every pregnancy. This provides protection to the newborn in the first months of life due to the transfer of antibodies against pertussis in utero. Pertussis vaccination of pregnant women at least 7 days before delivery has been shown to prevent pertussis in 91% of infants <3 months of age.<sup>12</sup>
- If a pregnant woman does not receive pertussis vaccine while pregnant, a dose should be given as soon as possible after birth to reduce the likelihood of passing pertussis to the newborn while they are most vulnerable.
- Any adult household contacts and carers (e.g. fathers, grandparents) of infants <6 months of age should receive a dTpa vaccine at least 2 weeks before beginning close contact with the infant, if more than 10 years has elapsed since a previous dose.

#### **Influenza**

- Seasonal influenza vaccination is funded under the NIP for pregnant women and can be given at any stage during pregnancy. It is particularly important for women who will be in their second or third trimester during the influenza season.
- Influenza vaccines have a good safety profile in pregnant women and have been demonstrated to prevent influenza complications in the women themselves and in their infants.<sup>13-15</sup>

Refer also to the NCIRS fact sheet on [Vaccinations during pregnancy](#).

#### **Aboriginal and Torres Strait Islander people**

Due to the higher rates of IPD and influenza in Indigenous adults compared to non-Indigenous adults, the eligibility criteria for NIP-funded vaccinations against

these diseases differ for Indigenous adults (see [Routine vaccinations for all adults: NIP-funded](#)). Every effort should be made to identify Indigenous patients in mainstream GP clinics to ensure all appropriate immunisations are given at the correct age.

### At-risk medical conditions

Pre-existing chronic diseases or comorbid conditions can increase a person's risk of acquiring vaccine-preventable diseases and developing serious complications of these diseases.

- Influenza vaccination is recommended for people with certain underlying medical conditions that increase their risk of serious influenza disease and complications, including, but not restricted to, chronic respiratory conditions, cardiac disease, neurological conditions, obesity (BMI  $\geq 40$ ), chronic liver disease and diabetes mellitus, as outlined in the *Handbook*.
- People with specific medical conditions are also indicated for pneumococcal, hepatitis A, hepatitis B, human papillomavirus (HPV) and meningococcal vaccination, described in more detail in the *Handbook*.
- Certain vaccinations are recommended for immunocompromised adults including (but not limited to):
  - oncology patients
  - solid organ and bone marrow transplant recipients
  - HIV-infected adults
  - adults with functional or anatomical asplenia.
- Live vaccines, including MMR, varicella, zoster, yellow fever and BCG vaccines, are generally (but with exceptions – see the *Handbook*) contraindicated in adult patients who are immunocompromised. In some instances, vaccination of household contacts is recommended to prevent transmission to the vulnerable individual.

Immunisation of adults who are immunocompromised can be complex and may involve alternative schedules to those recommended for immunocompetent adults. Vaccination is best considered in consultation with the patient's specialist healthcare provider or an immunisation expert.

If immunity following vaccination is uncertain, serological testing of antibody levels may be useful in some circumstances. For detailed information on vaccinating immunocompromised adults, see Section 3.3.3 in the *Handbook*.

### At-risk lifestyle behaviours

Lifestyle behaviours such as sexual practices, drug use and smoking are indications for certain vaccinations.

- Hepatitis A and hepatitis B vaccines are recommended for men who have sex with men (MSM) and people who inject drugs.
- MSM who have not previously been vaccinated should receive HPV vaccine, taking into account their likelihood of previous exposure to HPV and their future risks of HPV exposure.
- People who smoke tobacco have an increased risk of IPD and vaccination with 23vPPV is recommended.
- Meningococcal vaccines against serogroup B (Bexsero<sup>®</sup>) and serogroups A, C, W and Y (Menactra<sup>®</sup>, Menveo<sup>®</sup> or Nimenrix<sup>®</sup>) are recommended for young adults living in high-risk settings (such as new military recruits and students living in residential accommodation), prior to or as soon as possible after entry.

### At-risk occupations

Certain occupations put employees at greater risk of acquiring and/or transmitting a vaccine-preventable disease than the general population. These are described in more detail in Table 3.3.7 in the *Handbook* and include:

- healthcare workers, including trainees and students
- those who care for children
- carers of people with intellectual disabilities or the elderly
- students in healthcare-related fields
- laboratory personnel
- those who work with or are in contact with animals
- anyone exposed to human tissue, blood, body fluids or sewage
- emergency and essential service workers.

Healthcare workers in particular are a priority group for whom a number of vaccinations including pertussis, MMR, varicella, hepatitis B and influenza could be relevant, due to their personal risk of acquiring vaccine-preventable diseases from patients. Vaccination of healthcare workers also reduces the likelihood of them transmitting these infections to their patients, who are often vulnerable to serious complications following infection.

### Travel

This fact sheet is not intended to provide comprehensive information on vaccines for international travel purposes. A chapter outlining vaccines recommended for travellers can be found in the *Handbook*.

Travel is an important time to ensure that patients are up to date with standard vaccinations recommended for their age, including dT, MMR, polio and influenza. These diseases can be imported to Australia with travellers who



are not immune, leading to disease outbreaks as observed with measles in recent years.<sup>4,5</sup>

Travel vaccination requirements depend on the travel destination, likely risks of exposure to vaccine-preventable diseases, and the individual's medical and vaccination history. In some instances, documentation of vaccinations (e.g. against yellow fever) may be required under International Health Regulations. It is recommended that patients are referred to specialist travel health clinics or GPs with extensive experience in this area.

### **Migrants to Australia**

In many instances, adult migrants entering Australia do not have adequate immunity against one or more diseases for which vaccination is recommended in Australia. This may include hepatitis B, tetanus, diphtheria, polio and measles,<sup>16</sup> and catch-up schedules may be required.<sup>17</sup>

- Developing catch-up programs for migrants can be complex; advice can be found in the *Handbook*, or by contacting the relevant [state or territory health department](#).
- If no valid documentation of vaccination exists, a standard catch-up schedule should be commenced.
- If documentation is provided, it is important to check that the intervals between doses are appropriate.
- Serological testing is not routinely recommended but may be appropriate for hepatitis B and rubella.
- It is important to provide hand-held documentation of any vaccinations given and dates of future vaccinations.

### **How are adult vaccinations recorded?**

A 'whole-of-life' Australian Immunisation Register (AIR) was introduced to replace the Australian Childhood Immunisation Register (ACIR) in September 2016. The AIR aims to capture all NIP-funded and most privately purchased vaccines, given to people of all ages.

There are also separate registers for HPV school-based vaccinations and Q fever vaccination.

- Immunisation providers are encouraged to notify all Gardasil<sup>®</sup> and Cervarix<sup>®</sup> vaccinations to the National HPV Vaccination Program Register (HPV Register) ([www.hpvregister.org.au/health-professionals.aspx](http://www.hpvregister.org.au/health-professionals.aspx)).
- The Australian Q Fever Register can assist in determining an individual's immunity to Q fever ([www.qfever.org](http://www.qfever.org)).

### **What are vaccine coverage rates in adults?**

Government health departments and health professionals have previously relied on population surveys to estimate vaccination coverage in the adult population.

- The most recent data is from the Adult Vaccination Survey by the Australian Institute of Health and Welfare (AIHW) in 2009.<sup>18</sup> The survey reports that 74.6% of Australians aged  $\geq 65$  years received the seasonal influenza vaccine and 54.4% had been vaccinated against pneumococcal disease.<sup>18</sup>
- The uptake of other NIP vaccines, as well as those recommended for adults but not funded under the NIP, is not as well known, but is likely to be low.<sup>19</sup> Adult vaccination data captured in the AIR will be reported when reliable estimates can be obtained.
- Healthcare provider recommendation has shown to increase the likelihood of adults receiving their required vaccines.<sup>20</sup>

### **How are adverse events following immunisation in adults reported?**

Immunisation providers in all states and territories (except Tasmania) should report any significant or unexpected adverse event following immunisation (AEFI) directly to the relevant [health authority](#) in their state or territory, which will then forward the details of the notified adverse event to the TGA. Direct reporting to the TGA is also accepted. Providers in Tasmania should report directly to the TGA using the 'Blue card' form ([www.tga.gov.au/form/blue-card-adverse-reaction-reporting-form](http://www.tga.gov.au/form/blue-card-adverse-reaction-reporting-form)).

Advice on how to best manage patients who have experienced an AEFI can be obtained from [state and territory health departments](#) and/or designated clinics that are part of the AEFI–Clinical Assessment Network.

AusVaxSafety, is a sentinel surveillance system that actively monitors the safety of vaccines using SMS-feedback from recently vaccinated children and adults. In November 2016, AusVaxSafety expanded to support the National Shingles Vaccination Program as well as monitor influenza vaccine safety in all age groups. It is currently established in 110 sentinel immunisation providers across all Australian states and territories and will expand to over 200 sites in 2017.

## Additional resources for primary medical care/vaccination providers

- *The Australian Immunisation Handbook*, 10th edition – the most up-to-date clinical recommendations are contained in the online version of the *Handbook* [www.immunise.health.gov.au/internet/immunise/publicating.nsf/Content/Handbook10-home](http://www.immunise.health.gov.au/internet/immunise/publicating.nsf/Content/Handbook10-home)
- Immunise Australia website [www.immunise.health.gov.au](http://www.immunise.health.gov.au)
- National Immunisation Program schedule [www.immunise.health.gov.au/internet/immunise/publicating.nsf/Content/national-immunisation-program-schedule](http://www.immunise.health.gov.au/internet/immunise/publicating.nsf/Content/national-immunisation-program-schedule)
- ACT Health: [www.health.act.gov.au](http://www.health.act.gov.au)
- NSW Health: [www.health.nsw.gov.au](http://www.health.nsw.gov.au)
- Northern Territory Department of Health: [www.health.nt.gov.au](http://www.health.nt.gov.au)
- Queensland Health: [www.health.qld.gov.au](http://www.health.qld.gov.au)
- SA Health: [www.sahealth.sa.gov.au](http://www.sahealth.sa.gov.au)
- Tasmania Department of Health and Human Services: [www.dhhs.tas.gov.au](http://www.dhhs.tas.gov.au)
- Victoria – Health.vic: [www.health.vic.gov.au](http://www.health.vic.gov.au)
- WA Health: [www.health.wa.gov.au](http://www.health.wa.gov.au)

## References

1. Australian Technical Advisory Group on Immunisation (ATAGI). *The Australian immunisation handbook*. 10th ed (2016 update). Canberra: Australian Government Department of Health; 2016. Available from: [www.immunise.health.gov.au/internet/immunise/publicating.nsf/Content/Handbook10-home](http://www.immunise.health.gov.au/internet/immunise/publicating.nsf/Content/Handbook10-home).
2. Maggi S. Vaccination and healthy aging. *Expert Review of Vaccines* 2010;9(3 Suppl):3-6.
3. Wiley KE, Zuo Y, Macartney KK, McIntyre PB. Sources of pertussis infection in young infants: a review of key evidence informing targeting of the cocoon strategy. *Vaccine* 2013;31:618-25.
4. Najjar Z, Hope K, Clark P, et al. Sustained outbreak of measles in New South Wales, 2012: risks for measles elimination in Australia. *Western Pacific Surveillance and Response Journal: WPSAR* 2014;5:14-20.
5. Jost M, Luzi D, Metzler S, Miran B, Mutsch M. Measles associated with international travel in the region of the Americas, Australia and Europe, 2001–2013: a systematic review. *Travel Medicine and Infectious Disease* 2015;13:10-8.
6. Naidu L, Chiu C, Habig A, et al. Vaccine preventable diseases and vaccination coverage in Aboriginal and Torres Strait Islander people, Australia 2006–2010. *Communicable Diseases Intelligence* 2013;37 Suppl:S1-95.
7. NNDSS Annual Report Writing Group. Australia's notifiable disease status, 2012: annual report of the National Notifiable Diseases Surveillance System. *Communicable Diseases Intelligence* 2015;39:E46-E136.
8. Stein AN, Britt H, Harrison C, et al. Herpes zoster burden of illness and health care resource utilisation in the Australian population aged 50 years and older. *Vaccine* 2009;27:520-9.
9. Oxman MN, Levin MJ, Johnson GR, et al. A vaccine to prevent herpes zoster and postherpetic neuralgia in older adults. *New England Journal of Medicine* 2005;352:2271-84.
10. Aratchige PE, McIntyre PB, Quinn HE, Gilbert GL. Recent increases in mumps incidence in Australia: the "forgotten" age group in the 1998 Australian Measles Control Campaign. *Medical Journal of Australia* 2008;189:434-7.
11. Kelly HA, Gidding HF, Karapanagiotidis T, Leydon JA, Riddell MA. Residual susceptibility to measles among young adults in Victoria, Australia following a national targeted measles-mumps-rubella vaccination campaign. *BMC Public Health* 2007;7:99.
12. Amirthalingam G, Andrews N, Campbell H, et al. Effectiveness of maternal pertussis vaccination in England: an observational study. *The Lancet* 2014;384:1521-8.
13. Zaman K, Roy E, Arifeen SE, et al. Effectiveness of maternal influenza immunization in mothers and infants. *New England Journal of Medicine* 2008;359:1555-64.
14. Benowitz I, Esposito DB, Gracey KD, Shapiro ED, Vázquez M. Influenza vaccine given to pregnant women reduces hospitalization due to influenza in their infants. *Clinical Infectious Diseases* 2010;51:1355-61.
15. Black SB, Shinefield HR, France EK, et al. Effectiveness of influenza vaccine during pregnancy in preventing hospitalizations and outpatient visits for respiratory illness in pregnant women and their infants. *American Journal of Perinatology* 2004;21:333-9.
16. Skull SA, Ngeow JY, Hogg G, Biggs BA. Incomplete immunity and missed vaccination opportunities in East African immigrants settling in Australia. *Journal of Immigrant and Minority Health* 2008;10:263-8.
17. Phillips CB, Benson J. Better primary health care for refugees: catch up immunisation. *Australian Family Physician* 2007;36:440-4.
18. Australian Institute of Health and Welfare (AIHW). 2009 Adult vaccination survey: summary results. Cat. No. PHE 135. Canberra: AIHW; 2011. Available from: [www.aihw.gov.au/publication-detail/?id=10737418409](http://www.aihw.gov.au/publication-detail/?id=10737418409).
19. Dyda A, MacIntyre CR, McIntyre P, et al. Factors associated with influenza vaccination in middle and older aged Australian adults according to eligibility for the national vaccination program. *Vaccine* 2015;33:3299-305.
20. Mak DB, Regan AK, Joyce S, Gibbs R, Effler PV. Antenatal care provider's advice is the key determinant of influenza vaccination uptake in pregnant women. *Australian and New Zealand Journal of Obstetrics and Gynaecology* 2015;55:131-7.