

## Adult Vaccination Guidelines for Prescribers: Pre- & Post- Heart & Lung Transplant

National guidance on vaccine recommendations and schedules are subject to change. The following guidelines are a guide only and vaccination prescriptions are at the discretion of the treating physician with an appropriate medical review; taking into consideration current recommendations, patient contraindications such as allergies, and potential side effects.

### Pre-Heart & Lung Transplant Vaccinations

Hepatitis B	
Confirm serological status. If patient is not immune, they will need to commence accelerated vaccination schedule. Serology needs to be confirmed as per below schedule.	
<b>Notes:</b> If listing is imminent, the first dose can be administered in Heart Lung Clinic or on the ward. Must be completed post-transplant. Higher doses required for haemodialysis or pre-dialysis patients. See Australian Immunisation Handbook.	
<b>Route:</b> Intramuscular injection into deltoid muscle.	
<b>Engerix-B® (adult formulation)</b>	<b>Accelerated Schedule</b>
<b>1<sup>st</sup> dose:</b>	Day 0 (day of vaccination)
<b>2<sup>nd</sup> dose:</b>	7 days after 1 <sup>st</sup> dose
<b>3<sup>rd</sup> dose:</b>	21 days after 1 <sup>st</sup> dose
<b>** Check serology status 4 weeks after 3rd dose of Engerix-B®</b>	
<i>If patient has not seroconverted (anti-HBs level of &lt;10 mIU per mL) after 3 doses, patient will require a single booster dose. Recheck serology status 4 weeks after booster.</i>	
<i>Patients who still have an anti-HBs level &lt;10 mIU per mL require 2 further doses 1 month apart (the original booster dose is counted as the first of three boosters in total).</i>	
<i>If anti-HBs level remains &lt;10 mIU per mL post the additional 2 booster doses, patient may be unable to seroconvert; referral to immunology outpatient clinic for consideration of intradermal Hepatitis B may be advised by transplant physician if indicated.</i>	
<b>4<sup>th</sup> dose (Booster dose):</b>	12 months after 1 <sup>st</sup> dose
Access: via GP or local pharmacy (private prescription or NSW-funded free vaccine for eligible populations) or via Heart Lung Clinic (hospital-funded)	

## St Vincent's Hospital Heart and Lung Transplant Unit

Hepatitis A	
Indicated for liver transplant candidates and people with chronic hepatitis B infection. Confirm serological status. If seronegative give 2 doses 6 months apart.	
<b>Notes:</b> Combination hepatitis A and B vaccine (Twinrix (720/20)) can be used if hepatitis B vaccination also required. Use Hepatitis B accelerated vaccine schedule.	
<b>Preparation:</b> Havrix 1440®	
<b>Route:</b> Intramuscular injection into deltoid muscle	
<b>1<sup>st</sup> dose:</b>	Day 0 (day of vaccination)
<b>2<sup>nd</sup> dose:</b>	6 months after 1 <sup>st</sup> dose
Access: via GP or local pharmacy (private prescription)	

Human Papillomavirus	
For prevention of human papillomavirus infection in men and women of any age if not already vaccinated.	
<b>Notes:</b> One dose is recommended for immunocompetent people who start vaccination before their 26 <sup>th</sup> birthday. ( <i>Free via the National Immunisation Program.</i> ) People who start vaccination after their 26 <sup>th</sup> birthday, or those on significant immunosuppressive therapy regardless of age, require 3 doses ( <i>private prescription</i> ).	
<b>Preparation:</b> Gardasil 9®	
<b>Route:</b> Intramuscular injection.	
<b>People &lt; 26 years old</b>	
<b>Single dose only</b>	
<b>People ≥26 years old or on significant immunosuppressive therapy</b>	
<b>1<sup>st</sup> dose:</b>	Day 0 (day of vaccination)
<b>2<sup>nd</sup> dose:</b>	2 months after 1 <sup>st</sup> dose
<b>3<sup>rd</sup> dose:</b>	6 months after 1 <sup>st</sup> dose
Access: <ul style="list-style-type: none"> <li>• People &lt; 26 years old – via GP or local pharmacy (free via National Immunisation Program)</li> <li>• People ≥ 26 years old – via GP (private prescription)</li> </ul>	

## St Vincent's Hospital Heart and Lung Transplant Unit

Influenza
For prevention of some influenza strains, if not already vaccinated. Should be administered seasonally.
<b>Notes:</b> Nil
<b>Preparation:</b> Varies each year. People aged $\geq 65$ years should receive adjuvanted or high-dose influenza vaccine.
<b>Route:</b> Intramuscular injection or deep subcutaneous – will be preparation dependent.
Access: via GP or local pharmacy (free via National Immunisation Program)

Pneumococcal Disease	
Confirm with GP if patient is uncertain if they have received prior vaccination. Two preparations are used, at least 8 weeks apart.	
<b>Notes:</b> Pneumococcal vaccination schedule under review at time of writing. Check Australian Immunisation Handbook for updated guidance.	
<b>Route:</b> Intramuscular injection in deltoid muscle	
<b>Preparation:</b> Prevenar 13®	
<b>1<sup>st</sup> dose:</b>	Day 0 (day of vaccination)
<b>Preparation:</b> Pneumovax 23®	
<b>2<sup>nd</sup> dose:</b>	>8 weeks post Prevenar 13®
Access: via GP (free via National Immunisation Program)	

## St Vincent's Hospital Heart and Lung Transplant Unit

Varicella (Chicken Pox)	
Confirm serological status. If seronegative give 2 doses at least 4 weeks apart.	
<p><b>Notes:</b> this is a live vaccine and</p> <ul style="list-style-type: none"> <li>• <b>is contraindicated in any patient on immunosuppressants e.g. redo transplant, GVHD etc.</b></li> <li>• <b>must be given a minimum of 4 weeks before active listing and must not be administered post-transplant</b></li> </ul>	
<b>Route:</b> Subcutaneous injection	
<b>Preparations:</b> Varilrix® Varivax Refrigerated®	
<b>1<sup>st</sup> dose:</b>	Day 0 (day of vaccination)
<b>2<sup>nd</sup> dose:</b>	4-8 weeks after 1 <sup>st</sup> dose
Access: via GP or local pharmacy (private prescription, free via National Immunisation Program if < 20 years old)	

Herpes Zoster	
For prevention of shingles. Indicated for patients aged 18 years or older.	
<b>Notes:</b> Ideally completed at least one month before transplant	
<b>Route:</b> intramuscular injection	
<b>Preparations:</b> Shingrix®	
<b>1<sup>st</sup> dose:</b>	Day 0 (day of vaccination)
<b>2<sup>nd</sup> dose:</b>	1-2 months after 1 <sup>st</sup> dose
<p>Access:</p> <p>Via GP or local pharmacy (free via National Immunisation Program) for:</p> <ul style="list-style-type: none"> <li>• Adults over 65 years old</li> <li>• Aboriginal and Torres Strait Islander adults over 50 years old</li> <li>• Immunocompromised adults over 18 years old with solid organ or haematopoietic stem cell transplant, haematological malignancy, or other 'at risk' conditions. See Australian Immunisation Handbook for full list.</li> </ul> <p>Adults who do not meet the above criteria may access supply:</p> <ul style="list-style-type: none"> <li>• Via GP or local pharmacy (private prescription)</li> <li>• Via Heart Lung Clinic (hospital-funded)</li> </ul>	

## St Vincent's Hospital Heart and Lung Transplant Unit

Respiratory Syncytial Virus (RSV)
Indicated for patients aged 60 years or older.
<b>Notes:</b> Ideally given at least 4 weeks before transplant
<b>Route:</b> intramuscular injection (preferably into deltoid)
<b>Preparations:</b> Arexvy® Abrysvo®
<b>Single dose only</b>
<b>Access:</b> via GP or local pharmacy (private)

COVID-19	
Confirm patients have received a primary course ideally completed at least 2 weeks before transplant. Immunocompetent patients require 1 dose for their primary course. Patients with severe immunocompromise should receive 2 primary doses at least 8 weeks apart, and can consider a 3 <sup>rd</sup> dose based on individual risk assessment.	
<b>Notes: Guidance on vaccine schedules and available preparations continues to change.</b> Check Australian Immunisation Handbook for updated guidance.	
<b>Preparations:</b> Comirnaty Omicron XBB.1.5 (Pfizer) Spikevax Omicron XBB.1.5 (Moderna)	
<b>Route:</b> Intramuscular injection into deltoid muscle	
Immunocompetent patients	
<b>Single dose only</b>	
Severely immunocompromised patients*	
<b>1<sup>st</sup> dose:</b>	Day 0 (day of vaccination)
<b>2<sup>nd</sup> dose:</b>	At least 8 weeks after 1 <sup>st</sup> dose (can be given 3-4 weeks after 1 <sup>st</sup> dose if urgent listing)
<b>3<sup>rd</sup> dose (If indicated)</b>	At least 8 weeks after 2 <sup>nd</sup> dose. (can be given 3-4 weeks after 2 <sup>nd</sup> dose if urgent listing)
*Includes patients with chronic kidney disease or on dialysis, and those taking prednisolone ≥20mg/day, methotrexate ≥20mg/week, azathioprine ≥3mg/kg/day, 6-mercaptopurine ≥1.5mg/kg/day, mycophenolate ≥1g/day, tacrolimus, ciclosporin, sirolimus, everolimus, rituximab, JAK inhibitors, eculizumab.	
Access: via GP or local pharmacy (free throughout Australia)	

## St Vincent's Hospital Heart and Lung Transplant Unit

### Post-Heart & Lung Transplant Vaccinations

**\*\*Live vaccines are CONTRAINDICATED post-transplant\*\***

Influenza	
For prevention of some influenza strains, if not already vaccinated. Should be administered seasonally.	
<b>Notes: Lung and Heart recipient post-transplant administration schedule varies.</b> Give at least 1 month post-transplant.	
<b>Preparation:</b> Varies each year. People aged $\geq 65$ years should receive adjuvanted or high-dose influenza vaccine.	
<b>Route:</b> Intramuscular injection or deep subcutaneous – will be preparation dependent.	
HEART transplant schedule	
<b>Hearts first year post Tx 1<sup>st</sup> dose:</b>	Day 0 (day of vaccination)
<b>Hearts first year post Tx 2<sup>nd</sup> dose (booster):</b>	4 weeks after first dose
<b>Second year and thereafter:</b>	1 dose annually
LUNG transplant schedule	
<b>Lungs EVERY year post Tx 1<sup>st</sup> dose:</b>	Day 0 (day of vaccination)
<b>Lungs EVERY year post Tx 2<sup>nd</sup> dose (booster):</b>	4 weeks after first dose
<b>**Two doses of influenza vaccine at least 4 weeks apart are recommended annually for lung transplant recipients</b>	
Access: via GP or local pharmacy (free via National Immunisation Program)	

Pneumococcal Disease	
For ongoing protection against pneumococcus	
<b>Preparation:</b> Pneumovax 23®	
A 2nd dose of 23vPPV (Pneumovax 23®) is recommended at least 5 years after the 1st dose of 23vPPV.	
Access: via GP (free via National Immunisation Program)	

## St Vincent's Hospital Heart and Lung Transplant Unit

Herpes Zoster	
For prevention of herpes zoster, if not given pre-transplant. Indicated for patients aged 18 years or older.	
<b>Notes:</b> Do not give until antiviral prophylaxis is ceased	
<b>Route:</b> intramuscular injection	
<b>Preparations:</b> Shingrix®	
<b>1<sup>st</sup> dose:</b>	Day 0 (day of vaccination)
<b>2<sup>nd</sup> dose:</b>	1-2 months after 1 <sup>st</sup> dose
Access: via GP or local pharmacy (free via National Immunisation Program)	

Respiratory Syncytial Virus (RSV)	
Indicated for patients aged 60 years or older if not given pre-transplant	
<b>Notes:</b> Nil	
<b>Route:</b> intramuscular injection (preferably into deltoid)	
<b>Preparations:</b> Arexvy® Abrysvo®	
<b>Single dose only</b>	
<b>Access:</b> via GP or local pharmacy (private)	

## St Vincent's Hospital Heart and Lung Transplant Unit

COVID-19	
Unvaccinated recipients can receive their primary course at 3 months post-transplant. For primary course, patients are recommended to receive 2 primary doses and can consider a 3rd dose based on individual risk-benefit assessment. All primary doses should be given at least 8 weeks apart.	
<p><b>Notes: Guidance on vaccine schedules and booster doses may continue to change.</b></p> <p>Check Australian Immunisation Handbook for updated guidance.</p>	
<p><b>Preparations:</b> Comirnaty Omicron XBB.1.5 (Pfizer) Spikevax Omicron XBB.1.5 (Moderna)</p>	
<b>Route:</b> Intramuscular injection into deltoid muscle	
<b>Age 75 years or over</b>	<b>Booster every 6 months</b> , at least 3 months after transplant.
<b>Age 18-74 years</b>	<b>Booster every 6-12 months</b> (based on a risk-benefit assessment), at least 3 months after transplant
Access: via GP or local pharmacy (free throughout Australia)	

### References

1. Australian Technical Advisory Group on Immunisation (ATAGI). Australian Immunisation Handbook, Australian Government Department of Health and Aged Care, Canberra, 2024, immunisationhandbook.health.gov.au.
2. Danzinger-Isakov L, Kumar D, Vaccination of solid organ transplant candidates and recipients: Guidelines from the American society of transplantation infectious diseases community of practice. Clin Transplant . 2019 Sep;33(9):e13563. doi: 10.1111/ctr.13563. Epub 2019 Jun 5.
3. GlaxoSmithKline Australia Pty Ltd. Product Information: AREXVY Recombinant Respiratory Syncytial Virus pre-fusion F protein vaccine 120 micrograms powder vial and suspension vial suspension for injection (400657). 2024. (Accessed February 2024).