

## Candidate For or Recipient of Solid Organ or Islet Cell Transplant

Re-immunization is NOT indicated for these clients. Assess previous immunizations and offer vaccines to complete routine schedule. For specific vaccine schedule information, refer to [Part 4 - Biological Products](#).

Recommended vaccines for candidate or recipient of solid organ or islet cell transplant <sup>A</sup>	
All routine <u>inactivated</u> vaccines, including inactivated polio vaccine (IPV)	Immunize according to routine schedule. <b>Exception:</b> Children expected to be transplanted before 18 months of age (see <a href="#">Table 1: BC Children's Hospital Multi-organ Transplant Clinic Accelerated Immunization Schedule for Children Expected to be Transplanted Before 18 Months of Age</a> ).
COVID-19	Refer to <a href="#">Part 4: Biological Products, COVID-19 Vaccines</a> for recommendations.
Hepatitis A vaccine	Immunize liver transplant candidates and recipients.
Hepatitis B vaccine	Requires <a href="#">Hepatitis B Vaccine Higher Dose Schedule</a> . Kidney transplant candidates and recipients require the renal formulation. Post-immunization serology for anti-HBs is recommended (provide 2 <sup>nd</sup> series if response is < 10 IU/L). <sup>B</sup>
Hib vaccine	Unimmunized individuals 5 years of age and older require 1 dose.
Influenza vaccine	Immunize yearly (all those 6 months of age and older). <b>LAIV is contraindicated after transplantation.</b>
Meningococcal quadrivalent conjugate vaccine	Meningococcal quadrivalent conjugate vaccine for those 2 months of age and older. (This vaccine to be given in place of meningococcal C conjugate vaccine in the routine childhood immunization schedule). Reinforcement dose(s) are recommended. <sup>C</sup>
Pneumococcal vaccine	Conjugate and/or polysaccharide vaccine depending on age. Requires once only revaccination with polysaccharide vaccine.
MMR vaccine	Recommended before transplantation according to routine schedule. Refer to <a href="#">Immunization with Inactivated and Live Vaccines</a> . Use <a href="#">Referral Form for MMR Vaccination</a> . Last dose of MMR vaccine must be given at least 4 weeks prior to transplantation. <b>Live vaccines are generally contraindicated after transplantation.</b>
Varicella vaccine	Recommended before transplantation for susceptible individuals according to routine schedule. Separate doses by 12 weeks. Refer to <a href="#">Immunization with Inactivated and Live Vaccines</a> . Use <a href="#">Referral Form for Varicella Vaccination</a> . Last dose of varicella vaccine must be given at least 4 weeks prior to transplantation. <b>Live vaccines are generally contraindicated after transplantation;</b> univalent varicella vaccine may be given to select pediatric organ transplant recipients. <sup>D</sup>
Rotavirus vaccine	Refer to <a href="#">Immunization with Inactivated and Live Vaccines</a> . Use <a href="#">Referral Form for Rotavirus Vaccination</a> . Last dose of rotavirus vaccine must be given at least 4 weeks prior to transplantation. <b>Live vaccines are generally contraindicated after transplantation.</b>

<sup>A</sup> Additional vaccines may be recommended/required by BC Transplant that are not publicly funded and not included in this table. Refer to the [BC Transplant Pre-Transplant Vaccination Provincial Guidelines](#) for more information.

<sup>B</sup> Candidates for or recipients of a kidney transplant should be tested annually as per [Chronic Kidney Disease](#), see Hepatitis B Vaccination Guidelines for Patients with Chronic Kidney Disease.

<sup>C</sup> If individual was previously vaccinated at 7 years of age and older: give 5 years after previous dose. If individual was previously vaccinated at 6 years of age and under: give 3 years after previous dose. Re-immunize every 5 years as long as medical condition exists.

<sup>D</sup> Univalent varicella vaccine has been given to select pediatric organ transplant recipients without recent graft rejection and receiving baseline immune suppression. Varicella vaccine may be offered to such clients upon the recommendation of a medical specialist from the Multi-Organ Transplant Clinic at BC Children's Hospital per the [Referral Form for Varicella Vaccination](#).

Immunization should begin/resume at 3-6 months after transplant. However, influenza vaccine can be given as early as 1 month post-transplant during influenza season. If influenza season is ongoing at 3 months after transplant, a 2<sup>nd</sup> dose may be given, ensuring an interval of 4 weeks between doses.

Inactivated zoster vaccine (Shingrix®) is recommended by the National Advisory Committee on Immunization (NACI) for those 50 years of age and older, and may be considered for immunocompromised individuals 18 years of age and older. Although this vaccine is not provided free in BC, it may be purchased without a prescription at most pharmacies and travel clinics. [First Nations Health Benefits](#) provides coverage for Shingrix® for First Nations Elders who are 60 years and older. For more information, see [Part 4 – Biological Products](#), Zoster Vaccine.

BC Children's Hospital has developed immunization schedules and worksheets for infants who will be requiring a solid organ transplant either before or after they are 18 months of age. See [Table 1: BC Children's Hospital Multi-organ Transplant Clinic Accelerated Immunization Schedule for Children Expected to be Transplanted Before 18 Months of Age](#) and [Table 2: BC Children's Hospital Multi-organ Transplant Clinic Routine Immunization Schedule for Children Expected to be Transplanted After 18 Months of Age](#).

See [Worksheet for Immunization of Adult Solid Organ Transplant Candidates and Recipients](#).

Ideally, a recipient of solid organ or islet cell transplant should receive all vaccines before transplantation occurs. Vaccines are generally more immunogenic if given before transplantation because the immunosuppressive medications given after transplant to prevent and treat rejection of the transplanted organ may diminish the vaccine response. However, many children undergo transplantation before completion of their immunization schedule.

Live vaccines administered before the transplant must be completed at least 4 weeks before transplantation. Inactivated vaccines should be given at least 2 weeks before transplantation.

Solid organ and islet cell recipients usually receive lifelong immunosuppressive therapy. Live vaccines are generally contraindicated following transplantation except in certain circumstances.

Immunization should begin or resume at least 3-6 months after transplantation, when baseline immunosuppression levels are attained. However, in certain circumstances (e.g., during an outbreak), immunization may be recommended within the 3-6 months following transplantation if the expected benefits outweigh the risk of an inferior immune response to the vaccine. Additional post-exposure management (e.g., immune globulin) may also be considered.

If transplant recipients are treated for rejection using rituximab or anti-lymphocyte treatments (e.g., anti-thymocyte globulin), immunization should be deferred until 6 months post-treatment.

## Immunization of Living Donors

Living donors should be up-to-date with routine vaccines based on age, immunization history, and exposure history according to the BC Immunization Guidelines. Receipt of live vaccines should be avoided within 4 weeks prior to organ donation.

**Table 1: BC Children’s Hospital Multi-organ Transplant Clinic Accelerated Immunization Schedule for Children Expected to be Transplanted Before 18 Months of Age**

Age	Immunization	Date Given YYYY/MM/DD	Serology	Comments
2 months	DTaP-IPV-Hib Hep B PCV13 Men-C-ACYW Rotavirus <sup>A</sup>			INFANRIX hexa® is not appropriate as it does not contain the required hepatitis B dosing. Use <a href="#">Hepatitis B Vaccine Higher Dose Schedule</a> .  Rotavirus is a live vaccine: last dose must be given at least 4 weeks prior to transplantation.
3 months	DTaP-IPV-Hib Hep B PCV13 Rotavirus <sup>A</sup>			
4 months	DTaP-IPV-Hib PCV13 Men-C-ACYW			
6 months	MMR Varicella Hep B <sup>B</sup> Hep A ( <i>liver transplant only</i> )		Anti-HBs 1 month after 3 <sup>rd</sup> dose of Hep B	MMR and Varicella are live vaccines: last dose must be given at least 4 weeks prior to transplantation.
12 months	DTaP-IPV-Hib PCV13 Men-C-ACYW MMR Varicella Hep A ( <i>liver transplant only</i> )			MMR and Varicella – see above for timing prior to transplantation.
13.5 months (6 weeks after previous visit)	MMR <sup>C</sup> Varicella <sup>C</sup>			MMR and Varicella – see above for timing prior to transplantation.
24 months	PPV23			
4-6 years	Tdap-IPV Men-C-ACYW			Offer Men-C-ACYW at 3 years after the last dose, and then every 5 years.
7 years	PPV23			
Grade 6	HPV9			HPV9: 3-dose series
Grade 9	Tdap			
Annually	Influenza			Recommended for patient and all family members. LAIV is contraindicated post-transplantation.
	COVID-19			Refer to <a href="#">Part 4: Biological Products, COVID-19 Vaccines</a> for up-to-date recommendations.

Immunization should begin/resume at 3-6 months after transplant. However, influenza and COVID-19 vaccines can be given as early as 1 month post-transplant. If influenza season is ongoing at 3 months after transplant, a 2<sup>nd</sup> dose of influenza vaccine may be given, ensuring an interval of 4 weeks between doses.

<sup>A</sup> If any dose in the series is RotaTaq® or the product is unknown, a total of 3 doses of vaccine should be administered.

<sup>B</sup> Check anti-HBs 1 month post series. If anti-HBs < 10 IU/L, provide a 2<sup>nd</sup> series. Retest anti-HBs 1 month after 2<sup>nd</sup> series. Candidates for or recipients of a kidney transplant should be tested annually as per [Chronic Kidney Disease](#), see Hepatitis B Vaccination Guidelines for Patients with Chronic Kidney Disease.

<sup>C</sup> If 1<sup>st</sup> dose of MMR and/or varicella is given when child is under 12 months of age, 2 doses are recommended at 12 months of age or later. The final doses of MMR and varicella are given at 13.5 months in order to maintain an interval of 6 weeks between varicella doses, and to facilitate co-administration of these vaccines.

**Table 2: BC Children’s Hospital Multi-organ Transplant Clinic Routine Immunization Schedule for Children Expected to be Transplanted After 18 Months of Age**

Age	Immunization	Date Given YYYY/MM/DD	Serology	Comments
2 months	DTaP-IPV-Hib Hep B PCV13 Men-C-ACYW Rotavirus <sup>A</sup>			INFANRIX hexa® is not appropriate as it does not contain the required hepatitis B dosing.  Use <a href="#">Hepatitis B Vaccine Higher Dose Schedule</a> .  Rotavirus is a live vaccine: last dose must be given at least 4 weeks prior to transplantation.
4 months	DTaP-IPV-Hib Hep B PCV13 Men-C-ACYW Rotavirus <sup>A</sup>			
6 months	DTaP-IPV-Hib Hep B PCV13 Hep A ( <i>liver transplant only</i> )		Anti-HBs 1 month after 3 <sup>rd</sup> dose of Hep B	Provide a 2 <sup>nd</sup> series if anti-HBs < 10 IU/L at least 4 weeks after initial series. Candidates for or recipients of a kidney transplant should be tested annually as per <a href="#">Chronic Kidney Disease</a> , see Hepatitis B Vaccination Guidelines for Patients with Chronic Kidney Disease.
12 months	MMR Varicella Men-C-ACYW PCV13 Hep A ( <i>liver transplant only</i> )			MMR and Varicella are live vaccines: last dose must be given at least 4 weeks prior to transplantation.
18 months	DTaP-IPV-Hib MMR Varicella			MMR and Varicella – see above for timing prior to transplantation.
24 months	PPV23			
4-6 years	Tdap-IPV Men-C-ACYW			Offer Men-C-ACYW at 3 years after the last dose, and then every 5 years.
7 years	PPV23			
Grade 6	HPV9			HPV9: 3-dose series
At time of pre-transplant assessment or in Grade 9	Men-C-ACYW ( <i>if not previously given</i> ) Tdap			
Annually	Influenza			Recommended for patient and all family members. LAIV is contraindicated post-transplantation.
	COVID-19			Refer to <a href="#">Part 4: Biological Products, COVID-19 Vaccines</a> for up-to-date recommendations.

Immunization should begin/resume at 3-6 months after transplant. However, influenza and COVID-19 vaccines can be given as early as 1 month post-transplant. If influenza season is ongoing at 3 months after transplant, a 2<sup>nd</sup> dose of influenza vaccine may be given, ensuring an interval of 4 weeks between doses.

<sup>A</sup> If any dose in the series is RotaTaq® or the product is unknown, a total of 3 doses of vaccine should be administered.

<b>Date:</b>
YYYY/MM/DD

<b>Worksheet for Immunization of Adult Solid Organ Transplant Candidates and Recipients</b>					
<b>CLIENT INFORMATION</b>					
Name:					
	<i>Last</i>		<i>First</i>		
DOB:			PHN:		
	YYYY/MM/DD				
Date of Transplant:			Type of Transplant:		
	YYYY/MM/DD				
Vaccine	Date given YYYY/MM/DD	Date given YYYY/MM/DD	Date given YYYY/MM/DD	Date given YYYY/MM/DD	Date given YYYY/MM/DD
COVID-19					
Hepatitis A (liver transplant only)					
Hepatitis B					
Hib					
HPV9 (eligible individuals only)					
Influenza					
IPV					
Men-C-ACYW					
Pneumococcal Polysaccharide					
Td or Tdap					
MMR Live vaccine: for pre-transplant only					
Varicella Live vaccine: for pre-transplant only					
Additional vaccines may be recommended / required by <a href="#">BC Transplant</a> that are not publicly funded.					
Meningococcal B					
Pneumococcal Conjugate <sup>A</sup>					
Zoster (Shingles)					

<sup>A</sup> Pneumococcal conjugate vaccine (PCV13 or PCV15) should be provided at least 8 weeks prior to pneumococcal polysaccharide vaccine (PPV23). If PCV20 is provided, PPV23 is not required.