Solid Organ or Islet Cell Transplant (Candidate or Recipient)

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 <u>Part 4 - Biological Products</u>.

| Recommended vaccines for c | andidate or recipient of solid organ or islet cell transplant ^A | | | | | |
|---|--|--|--|--|--|--|
| All routine inactivated | Immunize according to routine schedule. | | | | | |
| vaccines, including inactivated polio vaccine (IPV) | Exception : Children expected to be transplanted before 18 months of age (see <u>Table 1</u> : <u>BC Children's Hospital Multi-organ Transplant Clinic Accelerated Immunization Schedule</u> for Children Expected to be Transplanted Before 18 Months of Age). | | | | | |
| COVID-19 vaccine | Refer to Part 4: Biological Products, COVID-19 Vaccine Eligibility for recommendations. | | | | | |
| Hepatitis A vaccine | Immunize liver transplant candidates and recipients. | | | | | |
| Hepatitis B vaccine | Requires <u>Hepatitis B Vaccine Higher Dose Schedule</u> . Kidney transplant candidates and recipients require the renal formulation. | | | | | |
| | Post-immunization serology for anti-HBs is recommended (provide 2^{nd} series if response is < 10 IU/L). ^B | | | | | |
| 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). LAIV is contraindicated after transplantation. | | | | | |
| 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. ^c | | | | | |
| Pneumococcal vaccine | Individuals 5 years of age and older unimmunized with PCV20 or PCV21 require 1 dose. For children under 5 years of age, see <u>Table 1</u> , <u>Table 2</u> and <u>Part 4: Biological Products –</u> <u>Completing a Pneumococcal Conjugate Vaccine Series</u> . | | | | | |
| MMR vaccine | Recommended before transplantation according to routine schedule. Refer to <u>Immunization with Inactivated and Live Vaccines</u> . Use <u>Referral Form for MMR</u> <u>Vaccination</u> . Last dose of MMR vaccine must be given at least 4 weeks prior to transplantation. Live vaccines are generally contraindicated after transplantation. | | | | | |
| Varicella vaccine | Recommended before transplantation for susceptible individuals according to routine schedule. Separate doses by 12 weeks. Refer to <u>Immunization with Inactivated and Live</u> <u>Vaccines</u> . Use <u>Referral Form for Varicella Vaccination</u> . Last dose of varicella vaccine must be given at least 4 weeks prior to transplantation. Live vaccines are generally contraindicated after transplantation; univalent varicella vaccine may be given to select pediatric organ transplant recipients. ^D | | | | | |
| Rotavirus vaccine | Refer to Immunization with Inactivated and Live Vaccines. Use Referral Form for Rotavirus Vaccination. Last dose of rotavirus vaccine must be given at least 4 weeks prior to transplantation. Live vaccines are generally contraindicated after transplantation. | | | | | |

^A Additional vaccines may be recommended/required by BC Transplant that are not publicly funded and not included in this table. Refer to the <u>BC Transplant Pre-Transplant Vaccination Guidelines</u> for more information.

^B Candidates for or recipients of a kidney transplant should be tested annually as per <u>Part 2 – Immunization of Special Populations,</u> <u>Chronic Kidney Disease</u>, see Hepatitis B Vaccine Program for Chronic Kidney Disease Clients.

^c 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.

^D 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 <u>Referral Form for Varicella Vaccination</u>.

Inactivated zoster vaccine (Shingrix®) is recommended by the National Advisory Committee on Immunization (NACI) for those 50 years of age and older, and 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. <u>First Nations Health Benefits</u> provides coverage for Shingrix® for First Nations Elders who are 60 years and older. For more information, see <u>Part 4 – Biological Products, Zoster Vaccine</u>.

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 <u>Table 1: BC</u> <u>Children's Hospital Multi-organ Transplant Clinic Accelerated Immunization Schedule for Children</u> <u>Expected to be Transplanted Before 18 Months of Age and Table 2: BC Children's Hospital Multi-organ Transplant Clinic Schedule for Children 18 Months of Age and Table 2: BC Children's Hospital Multi-organ Transplant Clinic Schedule for Children 18 Months of Age and Table 2: BC Children's Hospital Multi-organ 18 Months of Age and Table 2: BC Children's Hospital Multi-organ 18 Months of Age.</u>

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, 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 2nd dose of influenza vaccine may be given, ensuring an interval of 4 weeks between doses. 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., antithymocyte 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

| Hep B PCV20 Contain the required hepatitis B dosing. Use I Waccine Higher Dose Schedule. Rotavirus A Rotavirus is a live vaccine: last dose must be least 4 weeks prior to transplantation. 3 months DTaP-IPV-Hib Hep B PCV20 Rotavirus A Rotavirus A PCV20 4 months DTaP-IPV-Hib PCV20 Rotavirus A PCV20 Rotavirus A 4 months DTaP-IPV-Hib PCV20 Men-C-ACYW PCV20 MMR and Varicella are live vaccines: last dos 6 months MMR Anti-HBs 1 MMR and Varicella are live vaccines: last dos 12 months DTaP-IPV-Hib PCV20 MMR and Varicella are live vaccines: last dos 12 months DTaP-IPV-Hib MMR and Varicella - see above for timing privaticella are live vaccines: last dos given at least 4 weeks prior to transplantation 12 months DTaP-IPV-Hib MMR and Varicella - see above for timing privaticella are live vaccines: see above for timing privaticella - see above for timing privaticella are live vaccines: 13.5 months MMR ° MMR ° MMR and Varicella - see above for timing privaticella are live vaccines: 13.5 months MMR ° MMR ° MMR and Varicella - see above for timing pr | Age | Immunization | Date Given | Serology | Comments |
|---|-----------------|-------------------------|------------|-------------------------|---|
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| Grade 6 HPV9 HPV9: 3-dose series Grade 9 Tdap Tdap Annually Influenza Recommended for patient and all family men | 4-6 years | | | | Offer Men-C-ACYW at 3 years after the last dose, and |
| Grade 9 Tdap Annually Influenza Recommended for patient and all family men | | Men-C-ACYW | | | then every 5 years. |
| Annually Influenza Recommended for patient and all family men | | 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 Part 4: Biological Products, COVID-1 | | COVID-19 | | | Refer to Part 4: Biological Products, COVID-19 |
| Vaccines for up-to-date recommendations. | | | | | Vaccines 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 2nd dose of influenza vaccine may be given, ensuring an interval of 4 weeks between doses.

^A If any dose in the series is RotaTeq® or the product is unknown, a total of 3 doses of vaccine should be administered.

^B Check anti-HBs 1 month post series. If anti-HBs < 10 IU/L, provide a 2nd series. Retest anti-HBs 1 month after 2nd series. Candidates for or recipients of a kidney transplant should be tested annually as per <u>Part 2 – Immunization of Special Populations, Chronic Kidney Disease</u>, see Hepatitis B Vaccine Program for Chronic Kidney Disease Clients.

^c If 1st 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 | Serology | Comments |
|--|---|------------|---|---|
| 2 months | DTaP-IPV-Hib Hep B PCV20 | | | INFANRIX hexa® is not appropriate as it does not contain the required hepatitis B dosing. |
| | Men-C-ACYW Rotavirus ^A | | | Use <u>Hepatitis B Vaccine Higher Dose Schedule</u> . |
| | | | | Rotavirus is a live vaccine: last dose must be given at least 4 weeks prior to transplantation. |
| 4 months | DTaP-IPV-Hib Hep B PCV20 Men-C-ACYW Rotavirus ^A | | | |
| 6 months | DTaP-IPV-Hib Hep B PCV20 Hep A (liver transplant only) | | Anti-HBs 1 month after 3 rd dose of Hep B | Provide a 2 nd 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 <u>Chronic Kidney Disease</u> , see Hepatitis B Vaccination Guidelines for Patients with Chronic Kidney Disease. |
| 12 months | MMR Varicella Men-C-ACYW PCV20 Hep A (liver transplant only) | | | 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. |
| 4-6 years | Tdap-IPV Men-C-ACYW | | | Offer Men-C-ACYW at 3 years after the last dose, and then every 5 years. |
| Grade 6 | HPV9 | | | HPV9: 3-dose series |
| At time of pre- transplant assessment or in Grade 9 | Men-C-ACYW (if not previously given) Tdap | | | |
| Annually | Influenza | | | Recommended for patient and all family members. LAIV is contraindicated post-transplantation. |
| | COVID-19 | | | Refer to Part 4: Biological Products, COVID-19 Vaccines 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 2nd dose of influenza vaccine may be given, ensuring an interval of 4 weeks between doses.

^A If any dose in the series is RotaTeq® or the product is unknown, a total of 3 doses of vaccine should be administered.

| | | | | | Date: | | | | | |
|--|---------------|-------------------|--------|---------------|-----------------|----------|----------------------------------|----------------|--|--|
| | | | | | | | YYYY/MM/DD | | | |
| Worksheet for Immunization of Adult Solid Organ Transplant Candidates and Recipients | | | | | | | | | | |
| CLIENT | INFORMA | TION | | | | | | | | |
| Name: | | | | | | | | | | |
| | | Last | | | | | First | | | |
| DOB: | | | | | PHN: | | | | | |
| | | YYYY/MM/DL |) | | | | | | | |
| | | | | | L | | | | | |
| Date of | | | | Type of | | | | | | |
| Transplan | nt: | YYYY/MM/DD | | Transplant: | | | | | | |
| | • | | | | | | | | | |
| Vaccine | | Date given | Date | given | Date give | en | Date given | Date given | | |
| | | YYYY/MM/DD | ΥΥΥΥ/Λ | /M/DD | YYYY/MM/E | D | YYYY/MM/DD | YYYY/MM/DD | | |
| COVID-1 | 9 | | | | | | | | | |
| Hepatitis | А | | | | | | | | | |
| (liver transpl | | | | | | | | | | |
| Hepatitis B | | | | | | | | | | |
| Hib | | | | | | | | | | |
| HPV9 | | | | | | | | | | |
| | viduals only) | | | | | | | | | |
| Influenza | 1 | | | | | | | | | |
| IPV | | | | | | | | | | |
| Men-C-A | CYW | | | | | | | | | |
| Pneumo | coccal | | | | | | | | | |
| Conjugat | | | | | | | | | | |
| Td or Td | ар | | | | | | | | | |
| MMR | | | | | | | | | | |
| Live vaccine transplant of | | | | | | | | | | |
| Varicella | | | | | | | | | | |
| Live vaccine transplant of | nly | | | | | | | | | |
| | | cines may be reco | mmeno | ded / require | ed by <u>BC</u> | Transpla | <mark>ant</mark> that are not pu | blicly funded. | | |
| Meningo | | | | | | | | | | |
| Zoster (S | Shingles) | | | | | | | | | |