Adult SOT Recommendations

Immunization for Adult Solid Organ Transplant Candidates and Recipients

Revision Date: June 24, 2024

Rationale for update:

- Updated to incorporate replacement of Pneu-C13 with Pneu-C20 (Prevnar 20™).

Note: These recommendations do not impose mandatory immunization requirements on transplant candidates and recipients, and are not intended to replace the clinical skill, judgement and decisions of the individual's transplant healthcare team. These recommendations are meant to supplement existing recommendations for routine immunization as outlined in the current *Alberta Immunization Policy*.

See also Principles of Immunization for Hematopoietic Stem Cell Transplant and Solid Organ Transplant Recipients.

Inactivated vaccines should be given at least 2 weeks before transplantation and live attenuated vaccines should be given at least 4 weeks prior to transplantation. Consult with an attending physician before providing live vaccines.(1)

Routine Immunizations – Before Transplant

Vaccine	Series	Comments
COVID-19	Refer to Alberta immunization policy | Alberta.ca see COVID-19 vaccine biological products for current schedule	Consult with primary health care provider or medical specialist prior to immunization, including timing of when vaccine should be given. Refer to Alberta immunization policy | Alberta.ca see COVID-19 vaccine biological products for current schedule.
Tdap or Td	**3 doses** Dose 2: Four weeks after dose 1 Dose 3: Six months after dose 2 Tdap booster every 10 years	If an adult requires completion of a primary series of Td/Tdap, Tdap vaccine should be administered. Adults who have not previously received a dose of acellular pertussis in adulthood should receive a dose of Tdap, followed by Tdap boosters every 10 years. **Note:** If both Tdap and polio are indicated, Tdap-IPV may be used.
Polio IPV	**3 doses** Dose 2: Four weeks after dose 1 Dose 3: Six months after dose 2	Primary immunization with inactivated polio vaccine is recommended for all previously unimmunized SOT candidates and recipients.(1) **Note:** • Booster doses of IPV are not necessary for adults living in Canada except for adults at an increased risk of exposure. Those at higher risk of exposure (e.g., health care workers and laboratory workers) may receive a single lifetime booster dose.(1) • If both polio and Tdap are indicated, Tdap-IPV may be used. Immunity screening after immunization is not recommended.

Vaccine	Series	Comments
Pneumococcal Pneu-C20	Pneu-C20	Adults who previously completed a series with another pneumococcal conjugate vaccine and/or received the recommended doses of Pneumo-P vaccine are eligible for one dose of Pneu-C20 if they have not received Pneu-C20 vaccine.(1) • It is recommended that this dose be given at least 8 weeks after the last pneumococcal conjugate vaccine and at least one year after the last Pneumo-P vaccine(1) Immunity screening after immunization is not recommended.
Hib	1 dose	One dose is recommended for candidates/ recipients of SOT five years of age and older regardless of previous Hib immunization (at least one year after any previous dose) (1) Immunity screening after immunization is not recommended.
MenC-ACYW **(18 years to 24 years of age inclusive and those 25 years of age and older at higher risk)**	**18 – 24 years of age***: One dose (unless received as an adolescent at 12 years of age or older.)(1) *Booster doses are not indicated. **Increased risk: 18 years of age and older.**** (Underlying medical condition) Two doses eight weeks apart **Booster dose every 5 years if risk continues.(1) **Increased risk of exposure (laboratory workers)**: One dose	Recommended for individuals: • 18 – 24 years of age inclusive • Increased risk - 18 years of age and older as listed(1): ➢ Anatomical or functional asplenia including sickle cell disease ➢ HIV infection ➢ Congenital complement, properdin, factor D or primary antibody deficiencies ➢ Acquired complement deficiency e.g. those receiving eculizumab (Soliris™) ➢ Laboratory workers routinely exposed to *Neisseria meningitides* **Note:** Provincially funded vaccine is not provided for international travellers. Refer individuals to local travel health professionals. Immunity screening after immunization is not recommended.
Hepatitis B HBVD(1)	Follow the dosage and schedule for hypo-responsive individuals for Hepatitis B Vaccine. Repeat series if response is less than 10 IU/mL after series completion.(1)	Follow the dosage and schedule for hypo-responsive individuals for Hepatitis B Vaccine. **Laboratory Recommendations** Screen for anti-HBs within 1 – 6 months after the series is completed. If antibody levels are less than 10 IU/L, repeat the series once and retest for anti-HBs within 1 – 6 months after the repeat series.(1) Periodic screening as recommended by the transplant physician taking into account the severity of the immunocompromised state and whether or not the risk of hepatitis B is still present.(1) Ordering serology and interpretation of the results is the responsibility of the transplant physician.
HPV (Human Papillomavirus Vaccine) (18 –45 years of age inclusive)(2–5)	Three doses administered at 0, 2 and 6 months[1]	Immunity screening after immunization is not recommended.

Vaccine	Series	Comments
INFLUENZA (inactivated)	Annually	Administer a dose of inactivated influenza vaccine annually. Influenza vaccine can be administered as early as one month post-transplant at the discretion of the transplant physician.[3,6] • Solid organ transplant recipients: Live attenuated influenza vaccine (LAIV) is contraindicated. • Household contacts: Immunize annually with either inactivated influenza vaccine or live attenuated influenza vaccine. Immunity screening after immunization is not recommended.

MMR	One or two doses.
	
	If a second dose is indicated the interval between doses should be at least four weeks.[1]
		Evidence of Measles Immunity:
		• Individuals born in 1970 or later
		  ○ with a documented history of two doses of measles-containing vaccine OR
		  ○ history of laboratory confirmed measles disease OR
		  ○ laboratory evidence of measles immunity.
		• Individuals born prior to 1970 are generally considered to be immune. Serology may be recommended by the transplant physician
		It is recommended to provide age-appropriate MMR if time allows pre-transplant[3,6] to adults without evidence of immunity.[1]
		MMR is to be administered a minimum of four weeks prior to transplant.[1]
		MMR vaccine not recommended post-transplantation
		Laboratory Recommendations
		• Screening for measles and rubella immunity (IgG) post-immunization is not recommended.[3,6]
		• Annual screening for immunity is not recommended.
		• Mumps immunity screening is not recommended after immunization. Positive IgG serology following mumps immunization does not necessarily confirm immunity.

Varicella (chickenpox) **Varicella Vaccine**	1 or 2 doses	*Evidence of Immunity: • history of two doses of varicella vaccine after 12 months of age OR • laboratory evidence of immunity It is recommended to provide age-appropriate varicella vaccine if time allows pre-transplant to adults without evidence of immunity.[1] Varicella vaccine is to be administered a minimum of four weeks prior to transplantation, and at least 8 weeks before receiving Shingrix® (if applicable).[2,6,7] **Varicella vaccine not recommended post-transplantation** **Laboratory Recommendations** • Routine screen pre-transplant includes varicella IgG testing to confirm disease history. • Serology after first dose not recommended if there is time pre-transplant for second dose.[6] • Serology recommended 4 -6 weeks after second dose. **Note:** If VZ IgG is negative after the second dose, a third dose may be provided at the request of the transplant physician.[6,8–10] • If a third dose is indicated the interval between doses should be 3 months. If rapid protection is required it can be provided with a minimum interval of four weeks.[6] • While there are recognized issues with the sensitivity of the assays that are commonly used for varicella serology in clinical labs,

Vaccine	Series	Comments
		varicella seronegativity in SOT recipients is often used clinically as a marker for susceptibility to varicella infection when making decisions about immunization and post-exposure prophylaxis. In certain situations individuals who are VZ IgG negative after the second dose may benefit from a third dose of varicella vaccine.[6,8–10] Ordering serology and interpretation of the results is the responsibility of the transplant physician.
Herpes-Zoster (Shingles) Vaccine	Adults 18 years of age and older.[6] 2 doses: two to 6 months apart	**Shingrix®** (non-live recombinant Herpes Zoster vaccine) Shingrix® is recommended for adult SOT by **transplant physicians** for those 18 years of age and older.[1,6] This includes individuals who have received Zostavax ® prior to transplant. An interval of one year is recommended between live attenuated Herpes Zoster vaccine (Zostavax®) and Shingrix®. Vaccine should be provided at least 2 weeks prior to transplant as with other inactivated vaccines.[6] If an individual received varicella vaccine recently, there is to be a minimum of 8 week spacing before Shingrix® can be administered.[7] Post-transplant immunization may resume once the individual is on baseline immunosuppression, usually 6 to 12 months after transplant, and as determined appropriate by the individual's attending transplant physician. [1,6] Immunity screening after immunization is not recommended. **Shingrix® is available through the provincially funded immunization program.**

Non-routine Immunizations – Before and/or After Transplant

Vaccine	Series (if needed)	Comments
Hepatitis A HAV	Two doses: Second dose 6 – 12 months after the first dose.	Only for those considered at high risk: • Lifestyle risks of infection, including people engaging in illicit drug use (injectable and non-injectable) and men having sex with men • Chronic liver disease, liver transplantation; chronic liver GVHD following HSCT • Individuals receiving repeated replacement of plasma-derived clotting factors. • Workers involved in hepatitis A virus research or production of hepatitis A vaccine who may be exposed to hepatitis A virus. • Zoo-keepers, veterinarians and researchers who handle non-human primates. • Household /close contacts of children adopted from hepatitis A endemic countries. • Populations/communities at risk of hepatitis A outbreaks or in which hepatitis A is highly endemic. **Note:** Provincially funded vaccine is not provided for travellers – refer individuals to local travel health professionals. Immunity screening after HAV immunization is not routinely recommended.(1)
Meningococcal Men-B	Two doses at least 4 weeks apart.	Only for those considered at high risk of meningococcal disease: • Asplenia • Acquired complement deficiencies • Congenital complement, properdin, factor D deficiency or primary antibody deficiencies • HIV infection
Rabies RAB	**Pre-exposure**: days 0, 7, 21 or 28 **Post-exposure**: Rabies Immune Globulin and vaccine on day 0, and vaccine only on days 3, 7, 14 and 28. (Require 5 dose post-exposure series.) Serology every two years if pre- exposure risk continues. Booster as indicated depending upon serology results.	**Pre-exposure**: Should be administered intramuscularly only to those considered high risk (e.g. veterinary health technicians). Should be administered pre- transplant if possible, and completed at least 14 days before starting immunosuppressants.(1) **Post-exposure**: Rabies prophylaxis can be administered intramuscularly at any time before or after transplantation if indicated. **Laboratory Recommendations** Pre-exposure: Immunity screening is recommended 7 – 14 days after last dose of the series.(1) Post-exposure: Immunity screening is recommended 7 – 14 days after the completion of the vaccine series.(1) If an acceptable antibody response is not obtained, re-immunization with a second rabies vaccine series is recommended, followed by further serologic testing.(1) **Ordering serology and interpretation of the results is the responsibility of the transplant physician**.
RSV vaccine Arexvy® (Respiratory Syncytial virus)	Licensed for 60 years and older	Individuals should discuss the vaccine with their transplant physician.(6) Immunity screening after immunization is not recommended. Arexvy® may be administered at the same time as other vaccines. See AREXVY English Product Monograph (gsk.com) for additional information. Arexvy® is **not available** through the provincially funded immunization program. It is available by prescription and may be purchased at pharmacies and administered by physicians or pharmacists.

Vaccine	Series (if needed)	Comments
Typhoid TYVI* (inactivated)	1 dose Booster every three years if at continued high risk.[1]	*Only for those considered high risk. Individuals at high risk include household and/or intimate contacts of a typhoid carrier and laboratory workers who manipulate *Salmonella typhi*. Immunity screening after immunization is not recommended.

Travel Vaccines		
Hepatitis A HAV (Licensed for 12 months of age and older)	2 doses 6 to 12 months apart	
Japanese Encephalitis (Licensed for 2 months of age and older.)	See product monograph for scheduling	
Men-B (Licensed for 2 months to 25 years.)	See product monograph for scheduling	
Typhoid TYVI (Inactivated) (Licensed for 24 months of age or older.)	One dose	
Twinrix HABV	Not indicated. Require hyporesponsive dose of Hepatitis B vaccine.	
Yellow Fever (Licensed for 9 months of age and older.)	One dose	Contraindicated post-transplant
Travel Vaccines • Travel vaccines are not provincially funded in Alberta. • Transplant physicians should be consulted prior to administration of vaccines for travel purpose. • Inactivated vaccines for travel purposes may be administered at 6 – 12 months post-transplant. • Yellow fever vaccine is contraindicated post-transplant. • Clients requesting travel vaccines should be referred to local travel health professionals.		

Ongoing Recommendations after Transplant

Note: Immunization may resume once the individual is on baseline immunosuppression, usually 6 to 12 months after transplant.[1] If immunizations were not completed prior to transplant, complete the series for inactivated vaccines, including COVID-19 immunization, as previously indicated. Clearance letters are NOT required for SOT post-transplant.[6]

Live vaccines, are contraindicated after transplant.

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