



**Atlantic Provinces Pediatric Hematology Oncology Network
Réseau d'oncologie et d'hématologie pédiatrique des provinces de l'Atlantique**

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***** Immunizations for the HSCT population should only commence after consultation with the hematopoietic stem cell transplantation physician. ******

**Transplantation (Hematopoietic Stem Cell Transplantation
(HSCT)) Immunization Recommendations**

It is known that differences are present between children who undergo allogeneic versus autologous HSCT in regards to immunization responses, but not enough evidence is available to recommend different vaccination schedules. For the purposes of simplicity APPHON (in accordance with the American Society for Blood and Marrow Transplantation guideline 2009) is recommending the same schedule for both allogeneic and autologous HSCT patients.

Pre-Transplantation:

- If possible, all appropriate vaccines should be administered 10-14 days prior to implementation of ablative or immunosuppressive therapy if this can be achieved without delaying therapy. In allogeneic HSCT, consider administration of appropriate vaccines to the donor (at least) 10-14 days before bone marrow harvesting.

- All household and other close contacts should also be immunized if not previously immunized or immune with influenza, meningococcal, pneumococcal, MMR, varicella, pertussis.

Post-transplantation:

- All routine vaccinations with the exception of the influenza vaccine should start no earlier than 12 months post HSCT or at 3 months after stopping all chronic GVHD therapy, if greater than 1 year post transplant including high dose steroids (equivalent to 2 mg/kg/day prednisone or 20 mg prednisone/day for 2 weeks or longer).
- All household and other close contacts should also be immunized if not immunized prior to transplant

Routine Vaccines:

6 months after HSCT	12 months after HSCT	14 months after HSCT	16 months after HSCT	18 months after HSCT	22 months after HSCT	24 months after HSCT	27 months after HSCT	36 months after HSCT	3-5 year booster	Comments/Laboratory Recommendations
FLU										<p>The influenza virus vaccine should be given in the first year post-transplant and thereafter, particularly while receiving significantly immunosuppressing drugs, including high dose steroids (equivalent to 2 mg/kg/day prednisone or 20 mg prednisone/day for 2 weeks or longer).</p> <p>Influenza vaccine may be administered as early as 4 months post-transplant; a 2nd dose may be administered 4 weeks later if there is ongoing circulation of virus in the community.</p> <p>Children younger than 9 years of age receiving influenza vaccine for the first time post-transplant require 2 doses administered at least 4 weeks apart.</p> <p>Annual influenza vaccine with the inactivated product is strongly recommended for close contacts of pre- and post-transplant recipients.</p> <p>Immunity screening after immunization is not recommended.</p>

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	DTaP-IPV/Hib	DTaP-IPV/Hib	DTaP-IPV/Hib	Immunology consultation**	DTaP-IPV/Hib	Immunology consultation**		Immunology consultation		<p>Pentacel® for all aged children. Since children who have undergone HSCT do not respond as well as an immunocompetent host it is recommended by APPHON that all children regardless of age who have received a HSCT receive the larger dose of diphtheria and pertussis. This is supported by the ASBMT guideline (2009) but varies from the NACI guidance.</p> <p>Can be divided into two visits spaced by one month to limit total injections per visit; ensure 2 month interval between same vaccines.</p> <p>*Immunology consult if requested by hematology/oncology.</p> <p>**At 18 month-Immunology consultation: check diphtheria + tetanus + pertussis, Pneumococcus titers+ lymphocyte phenotypes (CBCdiff+Flow ID1,2)+IgG A M.</p> <p>***At 24 month-Immunology consultation: check hepB abs . Recheck Pn, Di, Per, Te,. only if they were inadequate earlier , Check CBCdiff, FlowId1,2, IgG A M Lymphocyte function tests needed only in case of abnormal flow results or in special clinical situation –immunologist decides</p> <p>The 16 month dose is not currently recommended by NACI for children older than 7 years the expert APPHON/ ROHHPA panel feels this dose should be given as these children historically respond poorly to this vaccination. Give the 22 month dose of DTaP –IPV/Hib regardless of results of the titers.</p>

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	Pneu-C	Pneu-C	Pneu-C	Immunology consultation	Pneu-C*	Pneu-23** Immunology consultation			Pneu-23***	<p>NACI dose recommend starting vaccination with pneumococcal vaccine as early as 6 months post HSCT, APPHON recommends starting vaccination with pneumococcal vaccine 12 months after HSCT as it is not felt that risk of infection is high prior to this time and response to vaccine may be inadequate.</p> <p>* Only give the 22 month dose of pneumococcal conjugate if 18-month response inadequate, than reassess until response adequate</p> <p>**Give a dose of pneumococcal polysaccharide vaccine (Pneu-23) at least 2 months after the last dose of pneumococcal conjugate vaccine. NACI doses suggest waiting 6-12 months after the last dose of pneumococcal conjugate before giving pneumococcal polysaccharide vaccine. The APPHON panel does not feel enough evidence supports waiting this period.</p> <p>***Repeat Pneu-23 in 3 years if less than 10 years of age; repeat in 5 years if 10 years or older.</p>

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	MenC-ACYW									Use Menveo for children less than 2 years of age and Menveo or Menactra for children 2 years and older.

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	Hep B+ A	Hep B+ A		Hep B+ A		Immunology consultation **				<p>Use Twinrix Junior for children 1-18 years Use Twinrix for 19 years and older.</p> <p>If HepB antibody level is suboptimal (checked at 24 month visit), a repeat series of Hepatitis B is indicated.</p> <p>NACI does not recommend the routine use of Hepatitis A vaccine in post HSCT patients. The expert APPHON panel feels that this population is at risk due to frequent travel to areas with high incidence of Hepatitis A.</p>

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		HPV	HPV		HPV					<p>HPV is given above 12 years as part of the school program to girls in Nova Scotia, New Brunswick and Newfoundland and to both girls and boys in PEI.</p> <p>Regardless of vaccination history a post HSCT patient should receive 3 doses of the HPV vaccine.</p> <p>The minimum interval between 1 and dose 2 is four weeks and between dose 2 and dose 3 is twelve weeks.</p>

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						MMR-V	Check MMRV serology	MMR-V		<p>If active cGVHD, live vaccines are contraindicated. A live vaccine may be administered after all immunosuppressive drugs have been discontinued for at least 3 months and the child is deemed immunocompetent by the transplant physician and has responded to the DTaP and pneumococcal conjugate vaccines.</p> <p>Antiviral medication should be discontinued at least 24 hours before receipt of varicella-containing vaccines and should not be restarted.</p>