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Guidelines for immunisation of children following treatment with high dose chemotherapy and Haematopoietic Stem Cell Transplantation (HSCT)

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Guidelines for immunisation of children following treatment with high dose chemotherapy and Haematopoietic Stem Cell Transplantation (HSCT)

Department of Haematology & Oncology
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Adapted from Vaccinations For Paediatric Patients Treated With Standard-Dose Chemotherapy And Hematopoietic Stem Cell Transplantation (HSCT) Recipients.
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General Principles

- All children should be considered for re-vaccination after allogeneic or autologous HSCT.
- In comparison to recipients of allogeneic HSCT, autologous HSCT recipients are less immune suppressed. However, both transplant types follow the same vaccination schedule content.
- The use of live vaccines is potentially dangerous until the child has been off all immunosuppressive treatment for at least 12 months and has no evidence of active chronic GvHD.
- Chronic GvHD and its treatment cause immune suppression, therefore these patients are at high risk of infectious complications.

All Haematopoietic Stem Cell Transplant (HSCT) recipients:

- Must be 12 months after any HSCT
- Should not have any evidence of active chronic GVHD
- Should be off all immunosuppressive treatment for at least 6 months
- Should not be given any live vaccines until the child has been off all immunosuppressive treatment for at least 12 months
- Should be off intravenous immunoglobulins for at least 3 months
- Should have normal serum immunoglobulins

NB In infants who have undergone allogeneic HSCT for primary immunodeficiency it may be appropriate to start vaccination earlier than specified above after discussion with BMT Team.

Vaccines contraindicated for HSCT Recipients

- BCG There is little data about the safety and effectiveness of the BCG vaccine in HSCT recipients. Its use is not recommended unless there is a clear case of need such as travel to or residence in an area with a high incidence of tuberculosis (greater than 40/100,000 per year) and provided the patient has no active chronic-GvHD and there is evidence of immune function recovery (such as normal serum immunoglobulin concentrations, recovery of lymphocyte function and CD4-lymphocyte numbers).Prior to administering BCG, particularly in patients that have previously had BCG, a tuberculin skin test should be done.
- Rotavirus

- Intranasal live attenuated Influenza vaccine
- VZV vaccine
- Yellow fever
- Live attenuated Typhoid vaccine

Other Vaccines
Hepatitis B vaccine and travel vaccines may be considered for individual cases (after discussion with the transplant team).

Vaccination of close contacts of HSCT Recipients
Avoid administration of live vaccines to siblings/ close family contacts of HSCT recipients. The exception is MMR, VZV, Shingles vaccine (Zostavax) and Rotavirus vaccines.

- **MMR Vaccine** should be given to contacts as per the national vaccination schedule.
- **VZV vaccine (Varivax)** should be offered to healthy susceptible siblings (and adult family members who are VZV seronegative) of VZV seronegative patients. There is a theoretical risk of transmitting the attenuated vaccine virus to a susceptible individual; as a precautionary measure, any person who develops a vesicular rash after receiving VZV vaccine should avoid direct contact with the patient until the rash is dry and crusted.
- **Shingles vaccine (Zostavax):**is offered toadults aged 70-79years old, so the patient's grandparents may be offered this vaccine depending on local practise. Rarely the transmission of vaccine virus may occur between those vaccinated who develop a varicella-like rash and susceptible contacts. As a precautionary measure, any person who develops a vesicular rash after receiving Zostavax should avoid direct contact with the patient until the rash is dry and crusted.
- **Rotavirus vaccine (Rotarix):** Is given to infants aged 6-24 weeks. **Rotarix should not be given to the patient** but can be given to siblings. There is potential for transmission from the infant to immunocompromised contacts through faecal-oral route for at least 14 days post-vaccination. However, vaccination of the infant will offer protection to household contacts from wild-type rotavirus disease and outweigh any risk from transmission of vaccine virus to any immunocompromised close contacts. Good personal hygiene should be observed following administration of Rotarix.

Vaccination schedule for High dose chemotherapy and Haemopoietic Stem Cell Transplant (HSCT)

Patient name and DOB:

Time after HSCT	Age under 10 years Vaccine	Age 10 years and over Vaccine	Recommended dates
Every autumn (start 6 months after transplant)	Inactivated influenza[1]	Inactivated influenza[1]	
12 Months	DTaP / IPV[2,3] (Infanrix-IPV) Hib / Men C[2,3] (Menitorix) DTaP/IPV/Hib/HepB[3] (Infanrix hexa) PCV13 Men B (Bexsero)	dTaP / IPV[2] (Repevax) Hib / Men C[2] (Menitorix) PCV13 Men B (Bexsero) HPV[4]	
13 Months	DTaP / IPV / Hib[2,3] (Pediacel) DTaP/IPV/Hib/HepB[3] (Infanrix hexa)	dTaP / IPV[2] (Repevax) HPV[4]	
14 Months	DTaP / IPV[2,3] (Infanrix-IPV) Hib / Men C[2,3] DTaP/IPV/Hib/HepB[3] (Infanrix hexa) PCV13 Men B (Bexsero)	dTaP / IPV[2] (Repevax) Hib / Men C PCV13 Men B (Bexsero)	
18 Months	MMR[5]	MMR[5] HPV[4]	
24 Months	MMR[5] Men ACWY Men B PnPS23	MMR[5] Men ACWY Men B PnPS23	
48 Months	DTaP / IPV (Infanrix-IPV) Hib / Men C	dTaP / IPV (Repevax) Hib / Men C	
School leaver booster	dT / IPV (Revaxis) Men ACWY	dT / IPV (Revaxis) Men ACWY	

[Vaccines: DTaP = Diphtheria/ Tetanus/ acellular Pertussis, dTaP = Low dose Diphtheria/ Tetanus/ acellular Pertussis, Hib = *H.influenzae b* conjugate, HepB =Hepatitis B, HPV = Human papillomavirus, IPV = Inactivated polio virus vaccine, Men B = Meningococcal B conjugate, Men C = Meningococcal C conjugate, Men ACWY = Menincococcal ACWY conjugate, MMR = Measles/Mumps/Rubella, PCV13 = 13 valent Pneumococcal conjugate, PnPS 23 = 23 valent pneumococcal polysaccharide]

[1]The intranasal live-attenuated influenza vaccine should not be given to HSCT recipients. Note that the immune response to influenza vaccine is not optimal during the first 6 months after HSCT, which is the period of greatest risk; therefore vaccination should be offered to family members and hospital staff.

[2] Can be given as Infanrix-IPV (for <10 years age at administration) or Repevax (for ≥10 years age)

[3] Give DTaP/IPV/Hib/HepB (Infanrix hexa) to children born after 1/07/17. Otherwise give DTaP / IPV (Infanrix-IPV) and Hib/Men C (Menitorix)

[4] HPV vaccine should be offered to girls ≥12 years old: 2 doses of HPV vaccine (Gardasil) should be given at 0 and 6 months from starting re-vaccination. If patient is aged 15 years and over, 3 doses recommended at 0,1, 6 months from starting re-vaccination.

[5] 1st dose of MMR should be given at 18 months provided patient is at least 12 months off all immunosuppressive treatment and fulfils criteria as above.