Guidelines for the immunisation of children following treatment with Standard-Dose Chemotherapy

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Guidelines for the immunisation of children following treatment with Standard-Dose Chemotherapy

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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

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- Avoid administration of all live vaccines to patients on chemotherapy and within 6 months following completion of chemotherapy
- Avoid administration of live vaccines, except MMR (Measles/Mumps/Rubella), VZV (Varicella Zoster Virus), LAIV (Live attenuated Influenza vaccine) and Rotavirus vaccines, to siblings of patients on chemotherapy (or within 6 months following completion of chemotherapy)
- Inactivated influenza vaccine is recommended annually in the autumn for all patients on chemotherapy or within 6 months of its completion. The live attenuated intranasal vaccine should not be given to this group of patients.
- Update primary health care records if vaccination takes place in hospital

Vaccination schedule for patients 6 months after completion of standard-dose chemotherapy
Booster doses of:

- Diphtheria, Tetanus, acellular Pertussis, IPV, Hib-conjugate (DTaP/IPV/Hib) [Pediacel®]
- Meningococcal C-conjugate vaccine (Men C) [NeisVac® or Menjugate®] Or Men ACWY-conjugate vaccine [Menveo®] for at risk children (treatment could have resulted in splenic dysfunction or asplenia or patient has underlying complement deficiency)

For children age 10 years and over give dTaP/IPV (Repevax) and Hib/Men C (Menitorix). For at risk children (treatment could have resulted in splenic dysfunction/ asplenia or patient has underlying complement deficiency) also give Men ACWY-conjugate vaccine [Menveo®].

- 13-valent Pnemococcal conjugate vaccine (PCV13) [Prevenar 13®]

- MMR [Priorix® or MMRVaxPRO®]: If patient only received 1 dose of MMR prior to starting chemotherapy then should receive 2 doses of MMR after completion of chemotherapy. The 2nd dose should be given 6 months after the 1st dose. The 2nd dose can be given 3 months after the 1st dose or can be considered even earlier (1 month after 1st dose) in measles outbreak situations.

- Human Papilloma Virus vaccine (HPV) for eligible girls [Gardasil®]: Girls that did not start or complete the course of HPV vaccination should be given 3 doses of HPV vaccine at 6, 8 and 12 months after completion of chemotherapy. Girls that did complete the course, a booster dose should be given.

Subsequent routine booster doses will not be necessary if scheduled to be given within one year of the above booster doses.

BCG Vaccine: If patient has previously had BCG and is considered to be at high risk of tuberculosis: perform mantoux test and if negative, re-vaccinate. If patient has not previously had BCG, vaccinate according to local policy.

Travel Abroad
Live vaccines such as BCG, VZV, MMR, oral typhoid and yellow fever should be avoided during chemotherapy and for 6 months after completion of chemotherapy.
Discuss with PTC.

Passive Immunisation
Significant contact with measles or with VZV infection requires passive immunisation (IVIg or acyclovir). This recommendation is applicable until 6 months after chemotherapy completion.

a) ***Passive immunisation following measles contact***

Contact requires action regardless of antibody status.

Children who have significant contact (play or direct contact for more than 15 minutes) with an individual with virologically confirmed measles during the infectious period from up to five days prior to, to four days after, the onset of the rash require passive immunisation. Every effort should be made to confirm the diagnosis of measles in the index case, but this may not always be possible.

If less than 14 days from contact give either intramuscular human normal immunoglobulin (HNIG) or intravenous immunoglobulin. Protection lasts approximately four weeks.

IVIg dose: 0.4g/kg

Intramuscular human normal immunoglobulin dose:

Under one year of age	250mg
1-2 years of age	500mg
Over 2 years	750mg

The benefit of HNIG is likely to be limited in individuals with detectable antibody and so, where an individual is known or likely to have pre-existing measles antibody, HNIG may not be required particularly where the degree of immunosuppression is less severe.

b) ***Passive immunisation after varicella zoster contact***

For varicella antibody positive patients no action is necessary.

For varicella antibody negative patients treatment is necessary following significant contact with an individual with chicken pox or disseminated zoster (play or direct contact for more than 15 minutes) during the infectious period from two days prior to the onset of the rash, until crusting of all vesicles, or with herpes zoster* (direct contact with exposed lesions only).

Treatment required includes either one of the two listed below:

1. Oral aciclovir from 7-21 days following the initial contact.
Aciclovir dose:

Under 2 years	200mg 4 times daily
2-6 years	400mg 4 times daily
> 6 years	800mg 4 times daily

2. If less than 72 hours from contact, give intramuscular zoster immunoglobulin (ZIG) or intravenous immunoglobulin. Protection lasts approximately 4 weeks.
ZIG dose:

Under 5 years	250mg
5-10 years	500mg
Over 10 years	750mg

IVIg dose: 0.4g/kg

NB ZIG is NOT available unless the contact is proven to be antibody negative

Vaccination of close contacts of patients receiving standard-dose chemotherapy (or within 6 months of completion)

Avoid administration of live vaccines to siblings/ close family contacts of patients on chemotherapy or within 6 months following completion of chemotherapy. The exception is MMR, VZV, Shingles vaccine (Zostavax) and Rotavirus vaccines.

- **MMR Vaccine** should be given to contacts as per the national vaccination schedule.

- **Shingles vaccine (Zostavax):** for adults 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.

Re-Vaccination schedule for patients receiving standard dose chemotherapy

Time after completion of Chemotherapy	Vaccination for under 10 years of age	Vaccination for over 10 years of age	Recommended Dates
Every autumn	Inactivated influenza[1]	Inactivated influenza[1]	
6 Months	DTaP / IPV / Hib[2] (Pediacel) PCV13 (Prevenar 13) MenC (NeisVac or Menjugate) Or Men ACWY (Menveo)[3]	dTaP / IPV[2] (Repevax) Hib / Men C (Menitorix) +/- Men ACWY (Menveo)[3] PCV13 (Prevenar 13) HPV[4] (Gardasil)	

	MMR first dose[5] (Priorix or MMR VaxPRO)	MMR first dose[5] (Priorix or MMR VaxPRO)	
8 Months		HPV[4] (Gardasil)	
12 Months	MMR Second dose[6] (Priorix or MMR VaxPRO)	HPV[4] (Gardasil) MMR Second dose[6] (Priorix or MMR VaxPRO)	
	Follow routine immunisation schedule – no further booster doses if due within 12 months of above	Follow routine immunisation schedule - no further booster doses if due within 12 months of above	

BCG: 1) If patient has not had BCG follow local policy
2) If vaccinated prior to chemotherapy and at high risk perform Mantoux test and if negative revaccinate

[DTaP = Diphtheria/ Tetanus/ acellular Pertussis, dTaP = Low dose Diphtheria/ Tetanus/ acellular Pertussis,
Hib = *H.influenzae b* conjugate, MMR = Measles/Mumps/Rubella,
HPV = Human papillomavirus, IPV = Inactivated polio virus,
Men C = Meningococcal C conjugate,
Men ACWY = Menincococcal ACWY conjugate,
PCV13 = 13 valent Pneumococcal conjugate,

[1]The intranasal live-attenuated influenza vaccine should not be used in the first 6 months of completion of chemotherapy. Note that there is a potential risk of transmission of live attenuated virus from LAIV to immunocompromised patients for 1-2 weeks following vaccination.
[2] Can be given as Pediacel (for <10 years age at administration) or Repevax (for ≥10 years age)
[3] Consider Men ACWY for at risk children (splenic dysfunction/asplenia, underlying complement deficiency)
[4] HPV vaccine should be offered to girls ≥12 years old: 3 doses of HPV vaccine should be given to girls who did not start or did not complete the course prior to chemotherapy. Single booster dose should be given to those who did complete the course prior to the start of chemotherapy
[5] Patients who received one dose of MMR prior to starting chemotherapy should receive 2 booster doses
[6] The 2nd dose of MMR is usually given 6 months after the 1st dose, but can be given 3 months after the 1st or even earlier (1 month after 1st dose) in outbreak situations.