Vaccination of HIV infected children (UK schedule, 2018)

Abbreviation list

DTaP/IPV/Hib – diphtheria/tetanus/acellular pertussis/inactivated polio vaccine/ *Haemophilus influenzae* type b

DTaP/IPV or dTaP/IPV - diphtheria/tetanus/acellular pertussis/inactivated polio vaccine

“D” - vaccines containing the higher dose of diphtheria toxoid (contain not less than 30IU)

“d” - vaccines containing the lower dose of diphtheria toxoid (contain approximately 2IU)

PCV13 – 13-valent pneumococcal conjugate vaccine

Hib/MenC - *Haemophilus influenzae* type b and *Neisseria meningitidis* capsular group C conjugate vaccine

MenC - meningococcal capsular group C conjugate vaccine

4CMenB – multicomponent meningococcal capsular group B protein vaccine

LAIV – live attenuate influenza vaccine

MMR – measles, mumps, rubella vaccine

HPV – human papilloma virus vaccine

MenACWY – quadrivalent meningococcal capsular groups A, C, W and Y conjugate vaccine

Hep A&B – combined hepatitis A and hepatitis B vaccine

BCG - Bacillus Calmette–Guérin vaccine

QIV – quadrivalent inactivated influenza vaccine

Table 1. Routine childhood immunisations (2018)

Age	Diseases protected against	Vaccine given	Trade name	Usual site
Eight weeks old	Diphtheria, tetanus, pertussis, polio, *Haemophilus influenzae* type b (Hib) and hepatitis B	DTaP/IPV/Hib/HepB	Infanrix hexa	Thigh
	Meningococcal group B (MenB)	MenB	Bexsero	Left thigh
	Rotavirus gastroenteritis	Rotavirus	Rotarix	By mouth
	Pneumococcal (13 serotypes)	PCV	Prevenar 13	Thigh
Twelve weeks old	Diphtheria, tetanus, pertussis, polio, Hib and hepatitis B	DTaP/IPV/Hib/HepB	Infanrix hexa	Thigh
	Rotavirus	Rotavirus	Rotarix	By mouth
Sixteen weeks old	Diphtheria, tetanus, pertussis, polio, Hib and hepatitis B	DTaP/IPV/Hib/HepB	Infanrix hexa	Thigh
	Men B	MenB	Bexsero	Left thigh
	Pneumococcal (13 serotypes)	PCV	Prevenar 13	Thigh
Six months and older	Influenza	QIV ≥6 months – 2 years LAIV ≥2 years old Consult annual DoH guidance	 Fluenz Tetra	Thigh Both nostrils
One year old (on or after the child's first birthday)	Hib and MenC	Hib/MenC	Menitorix	Upper arm/thigh
	Pneumococcal	PCV	Prevenar 13	Upper arm/thigh
	Measles, mumps & rubella	MMR*	MMR VaxPRO or Priorix	Upper arm/thigh
	Chicken pox	VZV* (2nd dose given ≥2m)	Varivax	Upper arm/thigh
	Men B	MenB	Bexsero	Left thigh
3 years 4 months old or soon after	Diphtheria, tetanus, pertussis and polio	DTaP/IPV	Infanrix IPV or Repevax	Upper arm
	Measles, mumps and rubella		MMR	Upper arm

		MMR* (check first dose given)	VaxPRO or Priorix	
12 – 13 years old (females & males)	Cervical cancer caused by human papillomavirus (HPV) types 16 &18; genital warts caused by types 6 & 11	HPV x 3 doses (0, 1, 6 months)	Gardasil	Upper arm
14 years old (school year 9)	Tetanus, diphtheria and polio Meningococcal groups A, C, W, Y disease Hepatitis A and B	dTaP/IPV (check MMR status) MenACWY Hep A and B, booster dose or primary course (if previously unimmunised)	Revaxis Nimenrix or Menveo Twinrix or Ambirix	Upper arm Upper arm Upper arm

Notes:

1. **All infants should follow the UK primary childhood immunization schedule. The primary immunization should NOT be delayed**.
2. Children should not receive BCG.
3. If HAART is indicated for the older children with absent or non-protective antibody levels – vaccination should be delayed until ~ 6 months of VL<50 and CD4>15%.
4. MMR*, VZV* or LAIV*should be postponed if there is severe immunosuppression (see Table 2 below). Also, avoid live vaccines if there is a severely immunocompromised household member, however consider the vaccination **as soon as** immune reconstitution is achieved on HAART. QIV should be given in place of LAIV.
5. VZV and MMR can be given either on the same day, or at a four week interval (2014, PHE recommendations).
6. VZV vaccine should be offered for VZV seronegative children over 1 year of age. 2 doses at least 2 months apart.
7. Flu. Live attenuated influenza vaccine (LAIV) should be given annually to children 2 years of age and older. If there is a severely immunocompromised household member, administer an injected QIV vaccine instead.
8. HBV course is included for babies as part of the routine NHS childhood vaccination programme from September 2018. Combined HAV/HBV vaccine should be considered in children over 1 year if previously unimmunized. All children should receive as adolescents a booster dose or full vaccination course (combined Hep A&B) if previously unimmunized. Consider giving earlier if at particular risk.
9. 2 doses of PCV13 should be offered to all age groups if previously unimmunized. The use of PPV is controversial in this context and not included in this guideline.
10. Men B is included for babies as part of the routine NHS childhood vaccination programme from September 1 2015. The vaccine could also be considered for all ages if previously unimmunized (see table 1 for recommended dosing schedule, "incomplete or uncertain immunization status guidance").
11. HPV. Quadrivalent vaccine (Gardasil), 3 doses, should be offered to both females and males.

Further information on immunisation can be found:

- **"Guidance on vaccination of HIV-infected children in Europe"**. Paediatric European Network for Treatment of AIDS (PENTA) Vaccines Group. HIV Med. 2012.
- Immunisation against infectious diseases GOV.UK, The Green Book. Routine Childhood Immunisations, Autumn 2018.

Table 2. Indicators of severe immunosupression (CDC, 1994)

Age	CD4 count	CD4%
<12 months	< 750	< 15%
1 – 5 years	< 500	< 15%
≥ 6 years	< 200	< 15%

Table 3. Consider serology (can be performed at time of annual reviews) and if seronegative, immunise accordingly, see the "incomplete or uncertain immunisation guidelines" 2018

When?	Which?
Baseline serology, if uncertain/incomplete immunisation (eg, new arrival)	Diphtheria, tetanus, MenC, Hib, PCV, VZV, HepA/B, MMR If seronegative, immunise accordingly
~ 16 – 18 months (at least 4 -6 weeks after primary booster immunisation)	PCV, Hib, MenC, VZV, HepB If seronegative, give booster immunisation accordingly
3 – 5 years old (at least 4-6 weeks after pre-school boosters)	Measles, rubella, tetanus, diphtheria If seronegative, give booster immunisation accordingly
13 – 18 years old (at least 4-6 weeks after boosters)	Hep A&B, measles, rubella, Men C, tetanus, diphtheria If seronegative, give booster immunisation accordingly
Pre-primary HBV vaccination	HepBsAg, HepBsAb, HepBcAb (if any serology positive discuss with Network hub re: further investigation/management)
6-8 weeks post 3rd dose HBV	HepBsAb (ideally >100 IU/L. If <10 IU/L after primary course, repeat primary course and repeat serology at 6-8 weeks. If continued failure of adequate serological response see BHIVA adult immunisation guideline and discuss with Network hub. If >10 but <100 IU/L after primary course, offer one booster vaccine and recheck serology after 6-8 weeks)

Notes.

1. If boosters are given, check serology at least 4 -6 weeks following immunisation.
2. If children are not on HAART, they are unlikely to make optimal responses. Repeat serology is not recommended
3. Repeat serology when on HAART for 6 – 12 months and re-immunise accordingly.
4. Check VZV and MMR serology following completion of the immunization and if no evidence of seroconversion after 2 doses - arrange the 3rd dose. If still seronegative after the 3rd dose of MMR or VZV vaccines, no further booster immunisation is recommended.
5. For PCV serology, serotype specific antibodies against pneumococcal serotypes included in the PCV13 should be requested
6. Serology results may be taken into account but it should be noted that correlates of protection are not well established in the paediatric HIV infected population.