

## Vaccination of children living with HIV (UK schedule, 2022)

### 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

Covid-19 – coronavirus disease

“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

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

QIV – quadrivalent inactivated influenza vaccine

### Live attenuated vaccines:

VZV – varicella zoster vaccine

BCG - Bacillus Calmette–Guérin vaccine (live attenuated)

MMR – measles, mumps, rubella vaccine

LAIV – live attenuate influenza vaccine

Oral rotavirus vaccine

**Table 1. Routine childhood immunisations including additional vaccinations for children living with HIV (highlighted), 2022**

Routine vaccination schedules will change, so please see links below for up-to-date information:

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1057798/Greenbook-chapter-14a-28Feb22.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1057798/Greenbook-chapter-14a-28Feb22.pdf)

<https://www.gov.uk/government/organisations/uk-health-security-agency>

Age	Diseases protected against	Vaccine given	Trade name	Usual site
Eight weeks old	Diphtheria, tetanus, pertussis, polio, <i>Haemophilus influenzae</i> type b (Hib) and hepatitis B	DTaP/IPV/Hib/HepB	Infanrix hexa	Thigh
	Meningococcal group B (MenB)	MenB	Bexsero	Left thigh
	Rotavirus	Rotavirus*	Rotarix	By mouth
Twelve weeks old	Diphtheria, tetanus, pertussis, polio, Hib and hepatitis B	DTaP/IPV/Hib/HepB	Infanrix hexa	Thigh
	Pneumococcal (13 serotypes)	Pneumococcal conjugate vaccine (PCV)	Prevenar 13	Thigh
	Rotavirus gastroenteritis	Rotavirus*	Rotarix	By mouth
Sixteen weeks old	Diphtheria, tetanus, pertussis, polio, Hib and hepatitis B	DTaP/IPV/Hib/He pB	Infanrix hexa	Thigh
	Men B	MenB	Bexsero	Left thigh
Six months and older	Influenza	QIV ≥6 months – 2 years	Fluenz Tetra	Thigh
		LAIV* ≥2 years old Consult annual DoH		Both nostrils

		guidance		
One year old (on or after the child's first birthday)	Hib and MenC  Pneumococcal  Measles, mumps & rubella  Chicken pox  MenB	Hib/MenC  PCV13 booster  MMR*  <b>VZV*</b> (2nd dose given $\geq 2m$ ) MenB	Menitorix  Prevenar 13  MMR VaxPRO or Priorix  Varivax  Bexsero	Upper arm/thigh Upper arm/thigh Upper arm/thigh  Upper arm/thigh Left thigh
3 years 4 months old or soon after	Diphtheria, tetanus, pertussis and polio  Measles, mumps and rubella	dTaP/IPV  MMR* (check first dose given)	Repevax or Boostrix-IPV  MMR VaxPRO or Priorix	Upper arm  Upper arm
12 – 13 years old (girls & boys)	Cervical cancer caused by human papillomavirus (HPV) types 16 & 18; genital warts caused by types 6 & 11	<b>HPV x 3 doses</b> (0, 1, 4-6 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
5 years and above	Covid-19	<b>Covid-19* x 3 doses</b>	Pfizer BioNTech	Upper arm

## Notes:

1. **All infants should follow the UK primary childhood immunisation schedule. The primary immunisation should NOT be delayed.**
2. Current green book recommendation is that children living with HIV should not receive BCG, however WHO now recommends that it may be given to infants at high risk of exposure to TB, but only to children on ART with good CD4 count
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. \*Rotavirus should be given to all infants, unless severely immunocompromised (CD4 count <750 or <15%)
6. VZV and MMR can be given either on the same day, or at a four-week interval (2014, PHE recommendations).
7. VZV vaccine should be offered for VZV seronegative children over 1 year of age. 2 doses at least 2 months apart.
8. \*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. Those who have not received influenza vaccine previously should be offered a second dose of vaccine, at least four weeks later.
9. Consider giving combined HAV/HBV vaccine 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.
10. Two 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.
11. 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”).
12. HPV. Quadrivalent vaccine (Gardasil), 3 doses is recommended for HIV positive children, both females and males.
13. \*Covid-19. Children and young people aged 5 years and above living with HIV should receive two primary doses of Pfizer BioNTech vaccine at an interval of at least eight weeks, followed by a booster (at least 3 months after 2<sup>nd</sup> dose). Furthermore, individuals aged 5 years and above who expect to share living accommodation on most days (and therefore for whom continuing close contact is unavoidable) with individuals of any age with HIV should be offered two doses of Pfizer BioNTech vaccine at an interval of at least eight weeks. Further seasonal boosters may be recommended in future, check Greenbook for latest guidance: <https://www.gov.uk/government/publications/covid-19-the-green-book-chapter-14a>

**Further information on immunisation can be found here:**

[“Guidance on vaccination of HIV-infected children in Europe”](#). Paediatric European Network for Treatment of AIDS (PENTA) Vaccines Group and Chiva HIV Med. 2012.

Immunisation against infectious diseases GOV.UK, The Green Book. Routine Childhood Immunisations, November 2022.

**Table 2. Indicators of severe immunosuppression (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:**

[Vaccination of individuals with uncertain or incomplete immunisation status, \(UKHSA\)](#)

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 A,C,W,Y 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)
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**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.