

INFORMATION PAPER

DHA-IHD
30 August 2019

SUBJECT: Counting Doses in Combined Regimens of Monovalent and Bivalent Hepatitis A and Hepatitis B vaccines

1. Purpose. To describe the required number of doses, using various combinations of monovalent (single antigen) hepatitis A and hepatitis B vaccines and the bivalent (combination hepatitis A and hepatitis B) vaccine, to ensure adequate immunity against both diseases.
2. Facts.
 - a. Service members and recruits may include personnel who are 17 years of age or older and must be screened by age to ensure they receive age-appropriate doses (pediatric/adolescent vs. adult) of hepatitis vaccines, depending on version of vaccine available. The age at time of dose administration determines the dosage of vaccine administered that day.
 - b. Two monovalent hepatitis A vaccines are marketed in the United States: Havrix (manufactured by GlaxoSmithKline or GSK) and Vaqta (manufactured by Merck).
 - c. Three monovalent hepatitis B vaccines are marketed in the United States: Engerix-B (manufactured by GlaxoSmithKline), Heplisav-B (manufactured by Dynavax) and Recombivax-HB (manufactured by Merck).
 - d. Single combination hepatitis A & B vaccine: GlaxoSmithKline markets Twinrix, a combination of their hepatitis A and hepatitis B vaccines.
 - e. The age-specific doses and dosing schedule of the hepatitis vaccines are as follows:

Monovalent Hepatitis A Vaccine (HAVRIX (GSK) or VAQTA (Merck))

Age	Number of Doses	Vaccine Dosage and Schedule
18 years of age or younger	1 initial dose and 1 booster dose	Administer an initial dose of 0.5 mL and a booster dose of 0.5 mL between 6 to 12 months later
19 years of age or older	1 initial dose and 1 booster dose	Administer an initial dose of 1 mL and a booster dose of 1 mL between 6 to 12 months later

Monovalent Hepatitis B Vaccine (ENGERIX-B (GSK) or RECOMBIVAX-HB (Merck))

Age	Number of Doses	Vaccine Dosage and Schedule
19 years of age or younger	3 dose series	Administer an initial dose of 0.5 mL and then the next two doses of 0.5 mL at 1 month and 6 months from the initial dose
20 years of age or older	3 dose series	Administer an initial dose of 1 mL and then the next two doses of 1 mL at 1 month and 6 months from the initial dose

Bivalent Hepatitis B Vaccine (TWINRIX (GSK))

Age	Number of Doses	Vaccine Dosage and Schedule
18 and over	3 dose series	1 mL at 0, 1, 6 mos

Monovalent Hepatitis B Vaccine (HEPLISAV-B (Dynavax))

Age	Number of Doses	Vaccine Dosage and Schedule
18 years of age or older	2 dose series	Administer an initial dose of 0.5 mL and then the final dose of 0.5 mL at 1 month.

NOTE: A single dose of HEPLISAV-B can serve as a valid dose of hepatitis B vaccine for the 3-dose ENGERIX-B or RECOMBIVAX-HB series, if age criteria are met.

- f. Age-specific doses (adult vs. pediatric/adolescent) must also be administered when the vaccine schedule includes both the monovalent and bivalent hepatitis vaccines. The mixed regimen of vaccines that induce adequate immunity against hepatitis A and hepatitis B are shown below. The individual vaccines within the combinations below can be administered in any sequence, if proper minimum timing between doses is observed. When Twinrix is part of the regimen, maintain the dose spacing requirement for Twinrix.

Mixed Regimen of Vaccines to Complete Hepatitis A and B Series

Hepatitis A and B (TWINRIX)	Hepatitis A (HAVRIX or VAQTA)	Hepatitis B (ENGERIX- B, HEPLISAV-B or RECOMBIVAX-HB)
17 years of age		
	2 doses HepA (0.5 mL)	3 doses ENGERIX-B or RECOMBIVAX_HB (0.5 mL); Ø HEPLISAV-B
18 years of age		
	2 doses HepA (0.5 mL)	3 doses ENGERIX-B or RECOMBIVAX-HB) or 2 doses HEPLISAV-B (0.5 mL)
1 dose Twinrix (1 mL)	2 doses HepA (0.5 mL) separated by 5 months	2 doses ENGERIX-B, RECOMBIVAX-HB or HEPLISAV-B (0.5 mL)
2 doses Twinrix (1 mL)	1 dose HepA (0.5 mL) administered 5 months after 2nd dose of Twinrix	1 dose ENGERIX-B, RECOMBIVAX-HB or HEPLISAV-B (0.5 mL) administered 5 months after 2nd dose of Twinrix
19 years of age		
	2 doses HepA (1 mL)	3 doses ENGERIX-B or RECOMBIVAX-HB or 2 doses HEPLISAV-B (0.5 mL)
1 dose Twinrix (1 mL)	2 doses HepA (1 mL) separated by 5 months	2 doses ENGERIX-B, RECOMBIVAX-HB or HEPLISAV-B (0.5 mL)
2 doses Twinrix (1 mL)	1 dose HepA (1 mL) administered 5 months after 2nd dose of Twinrix	1 dose ENGERIX-B, RECOMBIVAX-HB or HEPLISAV-B (0.5 mL) administered 5 months after 2nd dose of Twinrix

Hepatitis A and B (TWINRIX)	Hepatitis A (HAVRIX or VAQTA)	Hepatitis B (ENGERIX-B, HEPLISAV-B or RECOMBIVAX-HB)
20 years of age or older		
	2 doses HepA (1 mL)	3 doses ENGERIX-B or RECOMBIVAX-HB (1 mL) or 2 doses HEPLISAV-B (0.5 mL)
1 dose Twinrix (1 mL)	2 doses HepA (1 mL) separated by 5 months	2 doses ENGERIX-B or RECOMBIVAX-HB (1 mL) or HEPLISAV-B (0.5 mL)
2 doses Twinrix (1 mL)	1 dose HepA (1 mL) administered 5 months after 2nd dose of Twinrix	1 dose ENGERIX-B or RECOMBIVAX-HB (1 mL) or HEPLISAV-B (0.5 mL) administered 5 months after 2nd dose of Twinrix

Note: There are approved variations of recommendations based on the package inserts for the available vaccines.

3. References.

- a. Immunization Action Coalition, Ask the Experts, Hepatitis A on 30 AUG 2017. <http://www.immunize.org/catg.d/p2081.pdf> and http://www.immunize.org/askexperts/experts_hepa.asp#schedules.
- b. The ABCs of Hepatitis. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. <https://www.cdc.gov/hepatitis/resources/professionals/pdfs/abctable.pdf>
- c. Epidemiology and Prevention of Vaccine-Preventable Diseases, The Pink Book: Course Textbook - 13th Edition (2015). <https://www.cdc.gov/vaccines/pubs/pinkbook/hepb.html>

Central Region Vaccine Safety Hub
Approved: Deputy Chief, Immunization Healthcare Division