

Notes from the Field

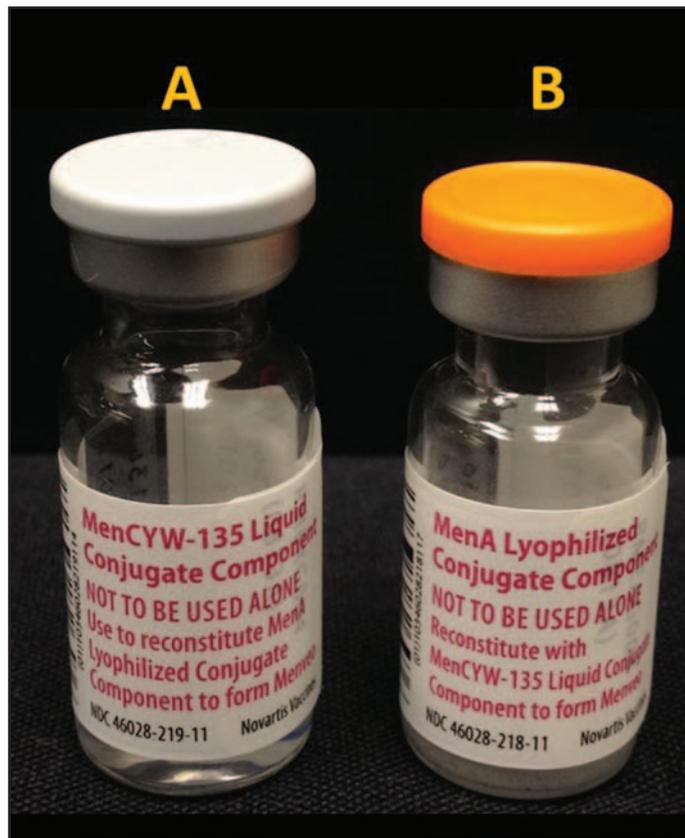
Administration Error Involving a Meningococcal Conjugate Vaccine — United States, March 1, 2010–September 22, 2015

John R. Su, MD¹; Elaine R. Miller, MPH¹; Jonathan Duffy, MD¹; Bethany M. Baer, MD²; Maria V. Cano, MD¹

Menveo (GlaxoSmithKline, previously Novartis AG) is a conjugate vaccine that was recommended in October 2010 for routine use in adolescents (preferably aged 11 or 12 years, with a booster at 16 years), and among persons aged 2 through 54 years with certain immunosuppressive conditions, to prevent invasive meningococcal disease caused by *Neisseria meningitidis* serogroups A, C, Y, and W-135 (1). These recommendations have since been updated (2). Menveo is supplied in two vials that must be combined before administration. The MenA lyophilized (freeze-dried) component must be reconstituted with the MenCYW-135 liquid component (Figure). To administer the vaccine, the liquid component is drawn into a syringe, and used to reconstitute the lyophilized component. The resulting solution is administered by intramuscular injection. Failure to prepare Menveo as directed by the manufacturer's instructions can lead to lack of protection against the intended pathogens (*N. meningitidis* serogroups A, C, Y, and/or W-135) (3). Recently, an immunization provider administered only the lyophilized component of Menveo, subsequently administered a properly prepared dose of Menveo to the same patient, and asked CDC if this practice was safe. This question prompted CDC to search the Vaccine Adverse Event Reporting System (VAERS) database for reports during March 1, 2010–September 22, 2015, of only one component of Menveo being administered. Additionally, to more broadly identify disproportional reporting of adverse events in general following Menveo immunization compared with other vaccines in VAERS (including errors in vaccine preparation and administration), the Food and Drug Administration performed data mining with empiric Bayesian methods (4).

There were 390 reports of administration of only one component of Menveo to a total of 407 recipients. A total of 269 (66%) recipients received only the liquid MenCYW-135 component, and 138 recipients received only the lyophilized MenA component, reconstituted in sterile water, saline, a different liquid vaccine (hepatitis B vaccine in two cases, and diphtheria-tetanus-acellular pertussis [DTaP] vaccine in one case), or an unspecified diluent. Six reports described clusters of events; five described administration of only the liquid MenCYW-135 component to a total of 21 recipients, and one described administration of only the lyophilized MenA

FIGURE. Labels for the two components of Menveo conjugate meningococcal vaccine, liquid MenCYW-135 (A) and lyophilized MenA (B), both indicating that neither component is to be used alone



component to two recipients. Among 314 recipients whose sex was reported, 160 (51%) were male. The median age of 293 recipients with known age was 15 years (range = 0–65 years); 87% were aged 11–20 years. Among all 407 recipients, 346 (85%) experienced no adverse event; the reported adverse events included redness, fever, and pain. Medical Dictionary for Regulatory Activities (MedDRA) preferred terms* that were reported at least twice as frequently as expected for Menveo (compared with all other vaccines) were all associated with administration of only one component of Menveo.

Vaccination providers should follow the instructions provided with Menveo (including vaccine labeling, packaging, and product insert) regarding proper administration. Vaccines

* MedDRA (<http://www.meddra.org/how-to-use/support-documentation/english>) provides a standardized vocabulary of medical terminology to facilitate sharing of regulatory information. MedDRA terms are hierarchical, from very specific low-level terms that are grouped into “preferred terms,” to broad groups of terms regarding organ systems. For this analysis, preferred terms were the most appropriate level of specificity for data mining.

requiring reconstitution should only be reconstituted with the specific diluent supplied by the manufacturer for that vaccine (3,5). A recipient who receives an improperly prepared dose of Menveo should receive a repeat dose of meningococcal conjugate vaccine prepared according to manufacturer instructions; this repeat dose can be administered at any time (3).

As a passive surveillance system, VAERS might capture only a fraction of events where only one component of Menveo is administered; therefore, these errors might be more common than VAERS data indicate. Administration of only one vaccine component is not unique to Menveo. Similar errors have been reported for Pentacel, another vaccine packaged as separate liquid (DTaP and inactivated poliovirus vaccine) and lyophilized (*Haemophilus influenzae* type b) components that must be combined before administration. By carefully following instructions included with the vaccine, administration errors with Menveo and similarly packaged vaccines can be prevented. Some reports to VAERS noted that the errors in administering Menveo were detected by routine processes as part of quality assurance. Strategies to prevent errors in vaccine administration are available from CDC (5).

¹Division of Healthcare Quality Promotion, National Center for Emerging and Zoonotic Infectious Diseases, CDC, ²Office of Biostatistics and Epidemiology, Center for Biologics Evaluation and Research, Food and Drug Administration.

Corresponding author: John R. Su, ezu2@cdc.gov, 404-498-0698.

References

1. CDC. Updated recommendations for use of meningococcal conjugate vaccines—Advisory Committee on Immunization Practices (ACIP), 2010. *MMWR Morb Mortal Wkly Rep* 2011;60:72–6.
2. Advisory Committee on Immunization Practices. Current meningococcal vaccine recommendations. Atlanta, GA: US Department of Health and Human Services, Advisory Committee on Immunization Practices; 2015. <http://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/mening.html>.
3. Meningococcal disease. Chapter 14. In: Hamborsky J, Kroger A, Wolfe S, eds. *Epidemiology and prevention of vaccine-preventable diseases*. 13th ed. Washington DC: Public Health Foundation; 2015. <http://www.cdc.gov/vaccines/pubs/pinkbook/mening.html>.
4. DuMouchel W. Bayesian data mining in large frequency tables, with an application to the FDA spontaneous reporting system. *Am Stat* 1999;53:177–90.
5. Vaccine administration. Chapter 6. In: Hamborsky J, Kroger A, Wolfe S, eds. *Epidemiology and prevention of vaccine-preventable diseases*. 13th ed. Washington DC: Public Health Foundation; 2015. <http://www.cdc.gov/vaccines/pubs/pinkbook/vac-admin.html>.