Advances in Pediatrics 64 (2017) 13–25
ADVANCES IN PEDIATRICS

Immunization Update VI

Ayesha Mirza, MD[a],
Mobeen H. Rathore, MD, CPE, FAAP, FPIDS, FIDSA, FSHEA, FACPE[a,b,*]

[a]University of Florida Center for HIV/AIDS Research, Education and Service (UF CARES), 910 North Jefferson Street, Jacksonville, FL 32209, USA; [b]Infectious Diseases and Immunology, Wolfson Children's Hospital Jacksonville, 800 Prudential Drive, Jacksonville, FL 32207, USA

Keywords

• Immunizations • Seasonal influenza vaccines • Adolescent vaccines
• Pediatric vaccines • Meningococcal vaccines • Pertussis • Measles
• Human papillomavirus

Key points

- Quadrivalent intranasal vaccine is not recommended for children.
- Recommendations for the newly approved meningococcal B vaccine.
- Human papillomavirus (HPV) vaccine recommendations changed from 3 to 2 doses.
- Global vaccine issues, including for polio vaccine and emerging infections vaccines, are discussed.

INTRODUCTION

Since the last update in Advances of Pediatrics, yet another virus has surfaced and replaced Ebola virus in the news. This time it is the Zika virus, a little known entity originally isolated from the blood of a rhesus macaque in the Zika forest in Uganda in 1947, hence the name. The virus caused sporadic disease in Africa and Asia from the 1950s onwards; however, it made international news when cases of microcephaly were increasingly recognized in association with the infection in the unborn fetuses of pregnant women in 2015 and 2016. The epidemiology and clinical features as well as extent of disease caused by this virus continue to be described and although there is no vaccine as yet, efforts to develop one are under way. Because Zika is a flavivirus

*Corresponding author. University of Florida Center for HIV/AIDS Research, Education and Service (UF CARES), 910 North Jefferson Street, Jacksonville, FL 32209. *E-mail address:* mobeen.rathore@jax.ufl.edu

http://dx.doi.org/10.1016/j.yapd.2017.03.015

and is related to other flaviviruses, such as dengue, yellow fever, and Japanese encephalitis virus, the platforms currently employ previously used models for other flaviviruses [1]. The National Institutes of Health and the World Health Organization have taken the lead on this and it is possible that the next immunization update will discuss the new Zika virus or Ebola vaccine.

For this issue, the vaccine updates focused on include influenza virus vaccine recommendations for the 2016 to 2017 influenza season as well as updated recommendations for meningococcal vaccines, HPV 9 vaccine, current updates on the poliovirus vaccines and global polio eradication efforts, and current travel vaccine updates. Given the complexity of the current immunization schedules and the availability of multiple vaccines, the Centers for Disease Control and Prevention (CDC) has devised a useful tool for parents to create customized schedules for their children by putting in a child's date of birth. This can be found at http://www2a.cdc.gov/nip/kidstuff/newscheduler_le/ (accessed October 29, 2016).

There are additional vaccines that are recommended for children with underlying medical conditions or who may be traveling to areas where they may be at higher risk for vaccine-preventable diseases. The most updated CDC recommendations for immunizations from birth through 18 years of age and for catchup immunizations for 2017 are readily accessible at the CDC Web site (http://www.cdc.gov/vaccines/schedules/index.html; accessed November 16, 2016).

INFLUENZA VACCINE RECOMMENDATIONS FOR THE 2016 TO 2017 INFLUENZA SEASON

The biggest change in influenza vaccine recommendations for the 2016 to 2017 season is that the quadrivalent live, attenuated influenza vaccine (LAIV4) is no longer recommended [2]. This is due to the poor performance of this vaccine in past seasons, particularly against influenza A (H1N1) viruses. During the 2015 to 2016 influenza seasons, the vaccine effectiveness of any influenza vaccine, live or inactive, against H1N1 and influenza B viruses was 47% (CI, 39%–53%) based on observational data collected by the Influenza Vaccine Effectiveness Network. LAIV4 in particular was not effective against any influenza 3 (A or B) among children 2 years through 7 years of age and in all pediatric age groups for the past 3 influenza seasons. LAIV4 did not provide any statistically significant protection against influenza. Compared with inactivated influenza vaccines, children who received LAIV4 had 2.5-times higher odds of developing influenza attributable to any virus.

Other recommendations for influenza vaccines do not differ significantly from previous years. Both the CDC and the American Academy of Pediatrics (AAP) recommend that influenza vaccine be given annually to all eligible individuals 6 months of age and older. This recommendation emphasizes immunization in all high-risk groups, including pregnant women; those who are postpartum and breast feeding during the influenza season; indigent populations, such as the native Alaskan as well as American Indian children; all children and adults with chronic medical conditions; all child care providers and staff; and importantly all school-aged children and health care personnel.