ARIZONA DEPARTMENT OF HEALTH SERVICES

Arizona Vaccine News

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Health and Wellness for all Arizonans

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VACCINE AND VACCINE-PREVENTABLE DISEASE NEWS

Measles Resurgence in the United States in 2019

- In 2000, measles was declared eliminated* in the United States (U.S.) [*defined as the absence of sustained transmission of the measles virus for more than 12 months].
- Measles is returning to the U.S., with 626 cases in 22 states as of April 19, 2019 due to people purposefully not immunizing their children and themselves.
- Immunocompromised people, young children, and people with poor nutritional status have the highest risk of complications and death from measles.

For more details, see the article in *New England Journal of Medicine* (NEJM), April 17, 2019.

- Up-to-date measles case counts for 2019 can be found on the measles website of the Centers for Disease Control and Prevention (CDC).

Worldwide Measles Cases Are Increasing in 2019

- The World Health Organization reports that reported cases of measles rose by 300% in the first three months of 2019, compared to the same period in 2018.
- Even in countries with high overall vaccination coverage, the disease spreads quickly among clusters of unvaccinated people.
- Even in high-income countries, complications result in hospitalization for up to 25% of cases. These complications from measles can lead to lifelong disability such as brain damage, blindness and hearing loss.

For more details, see the WHO Newsroom from April 15, 2019.

Measles in Europe in 2018: A Record-Setting Year

- 72 children and adults in Europe died from measles in 2018.
- There were 82,596 reported cases of measles:
  - Three times higher than 2017.
  - Fifteen times higher than 2016.

For more information, see the website of the World Health Organization.

Resurgence of Vaccine-Preventable Diseases in Venezuela

- Measles and diphtheria outbreaks are ongoing in Venezuela with an increase of cases of these diseases being seen in neighboring countries.
    - From week 26 of 2017 through week 43 of 2018, a total of 7,524 suspected cases of measles were reported and 75 deaths were attributed to measles.
    - Since 2016 (through October 29, 2018), there have been 2,170 cases of diphtheria reported with a case fatality rate of 22%.

For more details, including photographs of measles and diphtheria patients, see *Emerging Infectious Diseases* (EID), April 2019.

LITERATURE ON VACCINES AND VACCINE-PREVENTABLE DISEASES

How and Why Measles Was Eliminated in the U.S. Two Decades Ago

- Before measles vaccination, more than 90% of Americans were infected with measles by 15 years old, equating to about 4 million cases a year.
- In the late 1950s, measles resulted in the annual occurrence of about 450 deaths, 48,000 hospitalizations, 150,000 respiratory complications, and 4,000 patients with encephalitis (often associated with a high risk of neurological sequelae and death).
- Three immunization initiatives were required for measles elimination in the U.S.

For more details, see *Journal of Infectious Diseases* (JID), Supplement 1, May 2004.

Tetanus in an Unimmunized Child

- An unimmunized 6-year-old child in Oregon received a tetanus-prone wound and developed symptoms of tetanus 6 days later.
- He required 57 days of inpatient care, 47 of those days in the intensive care unit, 44 days on ventilator support (including a tracheostomy), and follow-up rehabilitative care.
- The inpatient charges totaled $811,929 (excluding air transportation, inpatient rehabilitation, and ambulatory follow-up costs).
- Although he received his first dose of DTaP in the hospital, **his parents declined the second dose of DTaP and any other recommended vaccinations.**

For more details, see *Morbidity and Mortality Weekly Report* (MMWR), March 8, 2019.

World-Wide Estimates of Tetanus Cases

- Estimating the global burden of tetanus is difficult, because most cases occur in low-income and middle-income countries where surveillance systems are limited.
    - 79% of estimated deaths due to tetanus (44,612 out of 56,743) occurred in south Asia and sub-Saharan Africa in 2015.
    - An estimated 34,019 deaths were caused by neonatal tetanus in 2015, down from the estimated 800,000 deaths that occurred annually in the 1980s.
- In high-income countries, cases of tetanus are reported on occasion, most often in older people (≥ 60 years) or in people who inject drugs.

For an extensive description of tetanus, see *Lancet*, April 20, 2019.

Imported Cutaneous Diphtheria

- From 2015-2018, CDC confirmed four cases of cutaneous diphtheria in people who had recently traveled to countries with endemic diphtheria.
- Respiratory disease from diphtheria can be life-threatening due to an adherent pseudomembrane in the upper respiratory tract.
- Cutaneous disease is typically characterized by slow-healing, well-demarcated ulcers from which bacteria can be spread to susceptible contacts, potentially resulting in either cutaneous or respiratory diphtheria.
- Health care providers should be aware that diphtheria can manifest as a cutaneous infection, particularly in persons with recent travel to countries with endemic diphtheria, even when *C. diphtheriae* is isolated along with other potential pathogens.

See the article in MMWR, March 29, 2019 for more details and the recommended public health response. Included is a photograph of a *C. diphtheria*-infected wound.

Meningococcal Serogroup B Outbreaks at Universities, 2013-2018

- Meningococcal serogroup B accounts for more than half of meningococcal disease cases among persons 16-20 years of age.
- Ten university-based outbreaks of meningococcal serogroup B in 7 states resulted in 39 cases and 2 deaths and triggered mass vaccination campaigns.

For more details, see EID, March 2019.

ACIP Recommends the Use of Hepatitis A Vaccine for People Experiencing Homelessness

- The Advisory Committee on Immunization Practices (ACIP) recommends that all persons aged 1 year and older experiencing homelessness should be routinely immunized against hepatitis A virus.

See MMWR, February 15, 2019.

Frequent Vaccine-Preventable Infections in Pediatric Solid Organ Transplant Recipients

- During the first 5 years after a solid organ transplant, more than 15% of children had at least one hospitalization for a vaccine-preventable infection (VPI).
    - Influenza, rotavirus, varicella and pneumococcus were the most common VPIs.
    - Children who received transplants when they were younger than 2 years old and transplant recipients of lung, intestine, heart, and multivisceral organs were at increased risk for hospitalization with a VPI.
- Less than half of all transplant recipients were up-to-date for age on immunizations at the time of transplant.

See *JAMA Pediatrics*, January 14, 2019.

Factors Affecting Male Adolescent HPV Vaccine Receipt

- Human Papillomavirus (HPV) vaccination coverage in male adolescents was studied using data from the 2011-2016 National Immunization Survey—Teen.
- HPV vaccine coverage was higher with a provider recommendation than without a provider recommendation (68.8% vs 35.4%).
    - Arizona HPV vaccine coverage was 75.7% with a provider recommendation versus 33.0% without a provider recommendation.
- A lower likelihood of HPV vaccination was found in adolescent males with a mother with some college or a college degree, those with a mother aged 35-44 years, and those who did not have a well-child visit at age 11-12 years.

For more details, see the article in *Journal of Pediatrics*, March 2019.

HPV Vaccine Decreases the Need for Surgery for Recurrent Respiratory Papillomatosis

- Recurrent respiratory papillomatosis (RRP) is caused by laryngeal infection with HPV and often requires multiple surgical procedures to keep the airway open.
- An analysis looked at the mean difference in number of surgical procedures per month before and after HPV vaccination.
    - The number of surgical procedures per month was significantly reduced after HPV vaccination (before vaccine: 0.35; after vaccine: 0.06).
    - The mean interval between surgeries increased from 7.02 months before HPV vaccination to 34.45 months after HPV vaccination.
    - HPV vaccine can serve as an adjuvant treatment for RRP.

See the abstract in JID, April 1, 2019.

Controversies in Vaccine Safety in the U.S.

- This article presents key evidence on some of the main vaccine safety controversies:
    1. MMR vaccine and autism
    2. Thimerosal and the risk of neurodevelopmental disorders
    3. Vaccine-induced Guillain-Barré Syndrome (GBS)
    4. Vaccine-induced autoimmune diseases
    5. Safety of the HPV vaccine
    6. Aluminum adjuvant-induced autoimmune diseases
    7. Too many vaccines given early in life
- A possible small increased risk of GBS following influenza *vaccination* has been identified, but the magnitude of the increase is *less* than the risk of GBS following influenza *infection*.
    - Otherwise, biological and epidemiologic evidence does not support any of these reviewed vaccine safety concerns.

For more details, see *Clinical Infectious Diseases*, February 12, 2019 [Epub ahead of print]

CDC Interim Estimates of 2018-19 Seasonal Influenza Vaccine Effectiveness

- Overall effectiveness: 47%
- Pediatric effectiveness: 61%

For more details, see MMWR, February 15, 2019.

Live Attenuated Vaccines and Infants Exposed *In Utero* to Biologic Response Modifiers

- The package insert for infliximab (Remicade®) says to wait at least six months following birth to give live vaccines to infants exposed *in utero* to infliximab.
- Giving vaccines to infants whose mothers have received a biologic response modifier (BRM) during pregnancy and who therefore may have immunosuppression is addressed in the *Red Book* of the American Academy of Pediatrics (31st edition, pages 85-87):
  1. Live attenuated vaccines:
     - Rotavirus vaccines should be avoided in U.S. infants for the first 12 months after the final *in utero* exposure to a BRM.
     - Measles-mumps-rubella (MMR) and varicella vaccines should still be given at the regularly scheduled ages starting at least 12 months of age or older.
     - For measles prevention in infants younger than 12 months following measles exposure during outbreak settings, immune globulin intravenous (IGIV) is preferred over MMR during the 12 months following the last maternal dose of BRM during pregnancy.
  2. International travel of U.S. infants should be discouraged for the 12 months following their mother's last dose of BRM during pregnancy.
  3. Inactivated vaccines should still be given according to CDC-recommended schedules.

Paralysis Due to Circulating Vaccine-Derived Poliovirus in Papua New Guinea

- The last cases of paralysis due to wild poliovirus in Papua New Guinea were in 1996. The country was declared free of wild poliovirus in 2000.
- Due to low vaccine coverage levels for polio vaccines, there is now a circulating vaccine-derived poliovirus type 1 (cVDPV1) outbreak with resultant cases of paralysis.

For more information about the cVDPV1 outbreak and containment activities, see MMWR, February 8, 2019.

DO YOU KNOW?

How long do you need to be off of "high-dose steroids" before it is recommended to get live attenuated vaccines?

- "High-dose steroids" is a dose equivalent to either ≥ 2 mg/kg of body weight or ≥ 20 mg/day of prednisone or equivalent for persons who weigh > 10 kg when administered for ≥ 14 consecutive days.
- Vaccination providers should defer *live attenuated virus vaccination* for at least 1 month after discontinuation of high-dose systemically absorbed corticosteroid therapy administered for ≥ 14 days.

See ACIP General Best Practice Guidelines for Immunization, chapter 8, p. 133.

RESOURCES

2019 CDC Recommended Immunization Schedules

- Printable versions of the 2019 vaccine schedules for children/adolescents and adults are available on the CDC immunization schedule website.
- A summary of the 2019 updated changes to these vaccine schedules is found in MMWR, February 7, 2019.

App Containing 2019 CDC Vaccine Schedules

- This free app visually mimics the printed schedules.
- See the CDC website for instructions on downloading "CDC Vaccine Schedules."

Redesigned CDC Vaccine Storage and Handling Toolkit

- The most recent version of the CDC Vaccine Storage and Handling Toolkit was released in January 2019.

CDC Animated Videos for Parents: How Vaccines Work

- Short videos that can be shared with parents through social media.
  - What to expect when your child is vaccinated.
  - How do vaccines fight infections?
  - How do germs make your baby sick?

Vaccine Safety References from the Children's Hospital of Philadelphia (CHOP)

- CHOP has compiled a library of key references regarding vaccine safety both for clinicians and for people who are involved in legal issues surrounding vaccine safety.

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