Lab Leadership: Vaccines to offer

December 14, 2023

Hepatitis B virus (HBV) Vaccine

- HBV vaccine is recommended for all laboratorians whose work-related activities involve exposure to blood or other potentially infectious materials.

- The hepatitis B vaccine series must be made available before the employee begins work at an assignment that would place them at risk of exposure to blood and body fluids unless:
  (1) the employee has previously received the complete series
  (2) results of HBV antibody testing reveals that the employee is immune or immunized, or
  (3) the vaccine is contraindicated for medical reasons

- The hepatitis B vaccine is administered as three intramuscular (IM) injections (2 dose for Heplisav-B)
  - first dose is followed in a minimum of 4 weeks by a second dose, which is followed in a minimum of 8 weeks by a third dose. There should be 16 weeks between dose 1 and 3.

- After completing the initial vaccination series, a post-vaccination hepatitis B surface antibody titer (anti-HBs) test should be performed in 1-2 months.

- If an employee is anti-HBs positive (immune), post exposure to blood or body fluids, no hepatitis B treatment is required. If anti-HBs is negative after initial vaccination, then 1-3 additional vaccine doses will be offered until anti-HBs is positive.

Tetanus-Diphtheria (Td) and Tetanus-Diphtheria-Acellular Pertussis vaccine (Tdap)

- Administer Tdap to all adults who have not previously received Tdap or for whom vaccine status is unknown. Tdap can be administered regardless of interval since the most recent tetanus or diphtheria-toxoid containing vaccine.

- Adults with an unknown or incomplete history of completing a 3-dose primary vaccination series with Td-containing vaccines should begin or complete a primary vaccination series including a Tdap dose.

- For unvaccinated adults, administer the first 2 doses at least 4 weeks apart and the third dose 6–12 months after the second.

- For incompletely vaccinated (i.e., less than 3 doses) adults, administer remaining doses.

Measles, Mumps, Rubella (MMR) vaccine

- Although laboratorians are not at a substantially increased risk for MMR infection (http://www.cdc.gov/vaccines/recs/schedules/downloads/adult/adult schedule.pdf) recommends that all adults born in 1957 or later with no evidence of vaccination or have no evidence of previous infection, unless they have a medical contraindication to the vaccine.

  - Evidence of immunity includes laboratory evidence of immunity to each of the three diseases, or documentation of provider-diagnosed measles or mumps disease.

  - Persons who received inactivated (killed) measles vaccine or measles vaccine of unknown type during 1963-1967 should be revaccinated with 2 doses of MMR vaccine.

  - This vaccine contains live virus. It should not be given during pregnancy or if employee is immunocompromised or life-threatening allergic reactions to any vaccine component, or if the employee has recently received blood products or is moderately or severely ill.

Meningococcal vaccine

- Microbiology staff working with *Neisseria meningitidis* cultures should receive a single dose meningococcal vaccine and repeated at 5 years.
- *Clinical microbiologists and research microbiologists who might be exposed routinely to isolates of N. meningitidis should receive a single dose of MCV4 and receive a booster dose every 5 years if they remain at increased risk.* (MMWR, Nov 24, 2011, Vol. 60, No.7).

  a) MCV4- quadrivalent (A, C, W-135, Y) conjugate meningococcal vaccine, licensed for persons aged through 55 years.

  b) MPSV4- quadrivalent (A, C, W-135, Y) polysaccharide meningococcal vaccine, for use in persons aged >55 years.

  c) MenABCWY vaccine may be used when both MenACWY and MenB are indicated at the same visit. (per Oct 2023 ACIP recommendations)

Typhoid vaccine

- Microbiology staff working with *Salmonella Typhi* cultures should be offered Typhoid vaccine

- CDC recommends vaccination for people traveling to places where typhoid fever is common, such as South Asia, especially India, Pakistan, or Bangladesh.
  - Ty21a 4 capsules by mouth every other day repeat every 5 years
  - VICPS one injection repeat every 2 years

Morbidity and Mortality Weekly Report (*MMWR*)

CDC Guidelines for the Prevention and Treatment of Anthrax, 2023

Recommendations and Reports / November 17, 2023 / 72(6);1–47

Anthrax vaccine:

1) Pre-exposure vaccination is recommended for laboratorians at risk for repeated exposure to fully virulent *B. anthracis* spores, such as those who ... handle environmental samples that might contain powders and are associated with anthrax investigations" or who "work in other settings where repeated exposures to *B. anthracis* aerosols may occur."

2) Vaccination is offered to personnel who:
   a) Are designated for performing testing as part of the biothreat response efforts working on:
      1. Clinical Bacillus species isolates or
      2. Unknown powders that may contain anthrax
      3. Who may be involved in the processing of environmental specimens as part of a biothreat response scenario.

https://www.cdc.gov/mmwr/volumes/72/rr/rr7206a1.htm?s_cid=rr7206a1_e&ACSTrackingID=USCDC_921-DM117184&ACSTrackingLabel=MMWR%20Recommendations%20and%20Reports%20%E2%80%93%20Vol.%2072%2C%20November%2017%2C%202023&deliveryName=USCDC_921-DM117184

Smallpox vaccination

- Uses live vaccinia virus. Must take precaution post vaccination to prevent spread.
- Smallpox vaccination is required for all laboratory personnel who perform variola-specific PCR testing, and all personnel who could be involved with processing specimens referred for possible smallpox testing. Personnel who decline vaccination are not permitted to perform variola testing or specimen processing.
- Smallpox vaccination must be given to laboratory workers who directly handle cultures of non-highly attenuated vaccinia virus, or other orthopoxviruses that infect humans (eg, monkeypox, cowpox, vaccinia strains, or variola) (MMWR 2001 ;50 (No. RR-10)
    - Vaccination is required at 3-year intervals.

Morbidity and Mortality Weekly Report

Use of a Modified Preexposure Prophylaxis Vaccination Schedule to Prevent Human Rabies: Recommendations of the Advisory Committee on Immunization Practices — United States, 2022

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1) Rabies vaccination is required for all employees working in areas where rabies virus testing occurs (including the animal necropsy laboratory and the laboratory where direct fluorescent antibody testing is performed).

2) Two does are given IM on days 0 and 7.

3) Check titers every **6 months**; booster if titer <0.5 IU/mL.
    1) Following completion of the initial vaccination series and semi-annually thereafter, the ACIP recommended Rapid Fluorescent Focus Inhibition Test (RFFIT) method is used to demonstrate rabies antibody response, and a protective level of immunity.

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Use of Ebola Vaccine: Recommendations of the Advisory Committee on Immunization Practices, United States, 2020

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- ACIP recommends use of the rVSVΔG-ZEBOV-GP Ebola vaccine (Ervebo)
- FDA approved live attenuated recombinant vesicular stomatitis virus (VSV) in which the gene encoding the glycoprotein of VSV was replaced with the gene encoding the glycoprotein of Ebola virus species *Zaire ebolavirus*
- HCW at designated Ebola treatment centers or laboratorians working in BSL-4 labs

Vaccines to protect in shared work-spaces

- All employees should be offered the Influenza vaccine through the annual facility wide immunization clinic or through employee's private health care provider
- Also consider SARS-CoV-2 and RSV