21 – Immunizations: Domestic, Travel, and Occupational-I, II

Speaker: Shireesha Dhanireddy, MD

2020 INFECTIOUS DISEASE BOARD REVIEW

Immunizations:
Domestic, Travel, and Occupational

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Professor, Allergy & Infectious Diseases
University of Washington

Disclosures of Financial Relationships with Relevant Commercial Interests

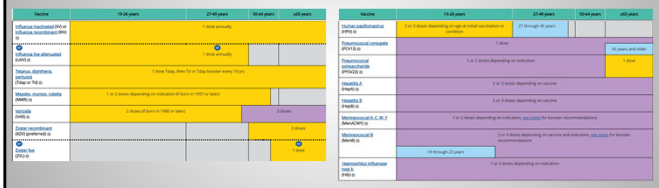
- None

Objectives

- Review vaccine guideline resources
- Review ACIP recommendations for routine immunizations
- Discuss travel immunizations
- Review vaccines in special populations

Key Sources

Only ACIP guidance for routine immunizations will be tested



https://www.cdc.gov/vaccines/schedules/hcp/adult.html

Key Sources

Only CDC guidance from yellow book for travel vaccines will tested

https://wwwnc.cdc.gov/travel/page/yellowbook-home

Egg Allergy

22 year old man with h/o egg allergy and no prior influenza vaccine presents for routine visit. He states he has had hives after eating eggs. No h/o anaphylaxis. **Which of the following is recommended?**

A. Defer vaccination and refer to an allergist for testing
B. Vaccinate with any inactivated influenza vaccine without monitoring
C. Vaccinate and monitor for 30 minutes after receiving any inactivated influenza vaccine
D. Vaccinate with only live attenuated influenza vaccine

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Egg Allergy – ACIP Recommendations

- Egg allergy
  - 1.3% of children
  - 0.2% of adults
- Ok to get influenza vaccine if the following:
  - No reaction with cooked eggs
  - Only hives after exposure
- If have anaphylaxis, angioedema, respiratory distress or required epinephrine
  - CAN STILL RECEIVE VACCINE – but should be given by a provider who can recognize allergic reactions
  - 33 cases of anaphylaxis out of 25.1 million doses
  - 8/33 had symptoms within 30 min

Question: Measles Vaccine

71 year old man underwent unrelated HSCT for MDS AML 12 years ago which was relatively uncomplicated without GVHD and he has been off immunosuppression for 2 years. His primary care provider checks a rubeola serology as there is an outbreak in the community and patient is concerned regarding risk. The serology is negative. **Which of the following do you recommend?**

A. Vaccine is not recommended as it is live and there is risk of vaccine related disease
B. One dose of MMR vaccine recommended
C. Two doses of MMR vaccine recommended

Measles Vaccine

- Over 1000 cases of measles in the US in 2019 as of the end of June
- 90% of cases in unvaccinated or unknown states individuals

- Vaccine very effective!
  - 93% effective after 1 dose
  - 97% effective after 2 doses
  - Immunity is felt to be lifelong*

Measles Vaccine

Evidence of presumptive immunity

- Written documentation of adequate vaccination
  - 1+ doses of vaccine at ≥12mos
    - Pre-school age
    - Adults not at high risk
  - 2 doses
    - School age children
    - College students
    - Healthcare personnel
    - International travelers
- Lab evidence of immunity
- Lab confirmation of measles disease
- Birth prior to 1957

Measles Vaccine

Who doesn't need vaccine:

- Adults born before 1957 (except HCW – should receive during an outbreak)
- Those with laboratory evidence of immunity

Who needs 1 dose:

- Adults born after 1957 considered low risk without documented vaccine and no lab evidence of immunity or prior infection

Who needs 2 doses:

- Healthcare workers
- International travelers born in 1957 or later
- Persons attending colleges or post-high school educational institutions

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Measles Vaccine

Measles vaccine may be administered post-transplant if:

- 2 years post transplant
- No active GVHD
- At least 1 year off immunosuppressive medications

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A. Vaccine is not recommended as it is live and there is risk of vaccine related disease
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Question: HPV Vaccine

An 24 year old healthy male presents for routine clinic visit. He is not on any medications. He smokes cigarettes. He is sexually active with both men and women and uses condoms consistently. Which of the following is correct regarding HPV vaccine?

A. He should receive 2 doses of HPV-9 spaced 6 months apart
B. He should receive 3 doses of HPV-9 at 0, 1, and 6 months
C. He does not need HPV vaccine as he is already sexually active
D. HPV vaccination is only recommended in males through age 21

HPV Vaccine

As of late 2016, only the nonavalent (9vHPV) vaccine is being distributed in the US

Nonavalent: Merck Gardasil 9®

- Types 6, 11, 16, 18, 31, 33, 45, 52, 58
- FDA-approved for females and males **9-45*** yrs
- Cost per dose $133-$193

HPV Vaccine Recommendations

- Routine vaccination at age 11 or 12 years*
- Recommended through age 26 for females **and males through age 21 (for now)** not previously vaccinated
- **Recommended for MSM and immunocompromised men (including persons with HIV infection) through age 26**
- **Up to age 45 through shared decision making**

* Vaccination series can be started at 9 years of age

MMWR 2015;64:300-4

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Now 2 Doses Adequate in Some Populations

- For boys and girls age 9-14:
  - –2 dose schedule: 0, 6-12 months
- For those who are >14 or immunocompromised:
  - –3 dose schedule: 0, 1-2, 6 months
  - –2 dose schedule not yet tested in this group, stay tuned
- Hope to reduce costs and increase uptake!

Meites et al, MMWR 2016: 65(49); 1405-1408.
Iversen et al, JAMA 2016: 316(22); 2411-2421.

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Question: Pneumococcal Vaccine

A 65 year old man with well controlled HIV presents to clinic for routine care. He received 13-valent conjugate pneumococcal vaccine 3 years ago and 23-valent polysaccharide vaccine 5 years ago. Which of the following is most accurate?

A. He does not need any further vaccination for pneumococcal disease
B. He needs a PCV13 alone
C. He needs a PCV13 followed 1 year later by a PPSV23
D. He needs a PPSV23 alone

Pneumococcal Disease

Age	Disease Incidence Cases/100,00 (# of cases)	Death Rate Deaths/100,000 (# of deaths)
<1	31.4 (142)	0.22 (1)
1	24.6 (112)	0.22 (1)
2-4	12.6 (171)	0.15 (2)
5-17	2.2 (111)	0.02 (1)
18-34	3.7 (261)	0.26 (18)
35-49	10.3 (670)	0.65 (42)
50-64	19.5 (1,068)	1.86 (102)
≥ 65	37.0 (1,291)	5.61 (196)
Total	12.9 (3,828)	1.22 (363)

Cox CM. CDC Manual for the Surveillance of Vaccine Preventable Diseases

Pneumococcal Vaccine in Adults: Who needs it?

- Persons ≥ 65 years of age
- Persons age 19-64 with:
  - – Chronic lung disease (**asthma** or COPD)
  - – Chronic heart disease (except HTN)
  - – Chronic liver disease
  - – CSF leak
  - – Smokers
  - – Diabetes
  - – Alcoholism
  - – Functional or anatomic asplenia
  - – Immunocompromising conditions

Pneumococcal Vaccine (PPSV23): Revaccination

- Not recommended for most persons
- Who should be revaccinated?
  - –Persons aged 19-64 with
    - Functional or anatomic asplenia
    - Immunocompromising conditions
- Multiple vaccinations not recommended

MMWR 2010. 59(34);1102-1106

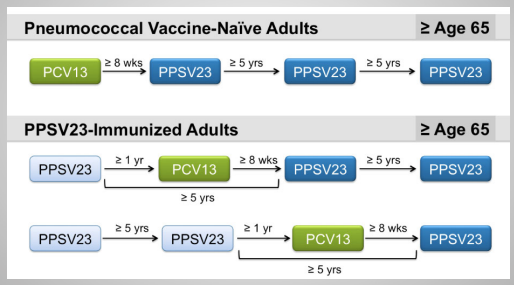
PPSV23 vs PCV13

- PPSV23 – contains polysaccharide antigens
- PCV13 – contains immunogenic proteins conjugated to pneumococcal polysaccharides

- PCV13 recommended for some immunocompromised (HIV) adults age < 65
- PCV13 recommended for persons ≥ 65 if not received already in adulthood

MMWR. 2015;64(34):944-7

Pneumococcal Vaccine Schedule in PWH



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Question: Hepatitis B Vaccine

A 35 year old woman with recently diagnosed HIV now on ART with VL UD and CD4 count 650 presents for f/u. She is HBV non-immune (HBsAb negative, HBcAb negative, HBsAg negative). She completes 3 doses of standard-dose HBV vaccine. Which of the following is most accurate?

A. She needs an additional dose of vaccine as she has HIV
B. She should have received double-dose vaccine as she has HIV
C. You should check HBsAb 1-2 months after completion, and give additional dose of vaccine if remains non-immune

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ACIP Recommendations for HBV Immunization in PWH

- Recombivax®: 3 dose series (0, 1, 6 months) 10 µg/mL IM **(AII)**

OR

- Engerix®: 3 dose series (0, 1, 6 months) 20 µg in 1.0 mL IM **(AII)**

OR

- Heplisav®: 2-dose series (0, 1 month) 20 µg in 0.5 mL IM **(CIII)**

Anti-HBs should be assessed 1-2 months after completion of series

Safety and efficacy of Heplisav® has not been studied in individuals with HIV

Question

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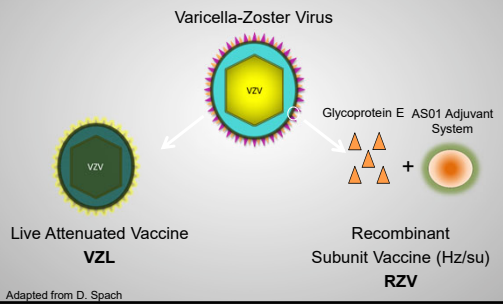
Question: Zoster Vaccine

A 62 year old woman with a self-reported history of shingles 10 years ago and type II diabetes presents to clinic. She received the live-attenuated zoster vaccine (ZVL) 2 years ago. What do you recommend regarding the zoster vaccine?

A. Vaccine not indicated given her history of zoster
B. Vaccine not indicated as she has received ZVL
C. Check VZV titer to confirm history. If negative, proceed with vaccination
D. Recommend recombinant zoster vaccine

Zoster Vaccines



Adapted from D. Spach

ACIP Recommendations for Zoster Vaccine

- RZV is preferred over ZVL
- Healthy adults ≥ 50 years
  - Regardless of prior h/o HZ
  - No need to wait any specific period of time after HZ to give RZV (just not during acute episode)
- 2 doses, 2-6 months apart
- Wait a minimum of 8 weeks after giving ZVL to give RZV
- ACIP not recommending use in immunocompromised persons (except low-dose immunosuppression)

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C. Check VZV titer to confirm history. If negative, proceed with vaccination
D. Recommend recombinant zoster vaccine

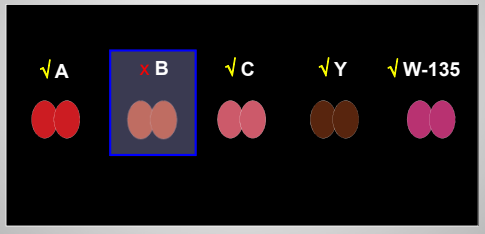
Question: Meningococcal Vaccine

44 year old woman hospitalized with anemia and thrombocytopenia diagnosed with complement-mediated HUS. Treatment with eculizumab is being considered. She is told she will need vaccine(s) prior to initiation of therapy.

A. Give meningococcal conjugate vaccine (MCV4)
B. Give meningococcal polysaccharide vaccine (MPSV4)
C. Give meningococcal B vaccine only
D. Give both MCV4 and meningococcal B vaccines

Meningococcal Quadrivalent Vaccines

Serogroups Included in Vaccine: A, C, Y, W-135

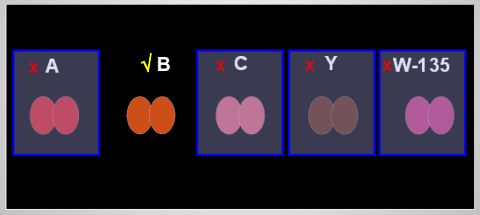


Meningococcal Quadrivalent Vaccines

Serogroups Included in Vaccine: A, C, Y, W-135

- *Menactra* (MCV4)
  - Conjugate vaccine
  - Approved for ages 9 months to 55 years
- *Menveo* (MCV4)
  - Conjugate vaccine
  - Approved for ages 2 months to 55 years
- *Menomune* (MPSV4) – *NO LONGER AVAILABLE*
  - Polysaccharide vaccine
  - Approved for persons >2 years of age

Meningococcal B Vaccines



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Meningococcal Group B Vaccines

Serogroups Included in Vaccine: B

- MenB-4C (*Bexsero*)
  - Recombinant vaccine
  - For ages 10 to 25 years
  - 2 dose series ≥1 month apart
- MenB-FHbp (*Trumenba*)
  - Recombinant vaccine
  - For ages 10 to 25 years
  - Healthy adolescents and young adults: 2 doses at 0, 6 months
  - Adults at risk for meningococcal disease: 3 doses at 0, 1-2, 6 months
  - Vaccinated during serogroup B meningococcal disease outbreaks: 3 doses at 0, 1-2, 6 months

ACIP Meningococcal B Vaccine Recommendation Adolescents and Young Adults

- Recommended fo
  increased risk, pr
  - Meningococcal
  - Asplenia
  - Complement d
  - On eculizumab
  - Microbiologist
    Neisseria meni
- Same vaccine should be used for all doses


BREAKING TOP STORY

Meningococcus returns to OSU: Student being treated for disease

BENNETT HALL Corvallis Gazette-Times Oct 27, 2017

CDC. MMWR. 2015;64:1171-6.

Eculizumab

- Soliris (eculizamab) 1000-2000x increased risk of meningococcal meningitis
- CDC recommendations –
  - –Immunize with both quadrivalent and B vaccines at least 2 weeks prior to giving eculizumab if possible
  - –Repeat immunization every 5 years while on eculizumab
- Risk remains increased despite vaccination

Question: Tdap

A 27 year old pregnant woman presents for her routine obstetrics visit at her 32 week gestation visit. She is G2P1. She has a healthy 2 year old daughter at home. Which statement is correct regarding Tdap in pregnancy?

A. She should receive a Tdap today only if she has not received in the past 5 years.
B. She should receive Tdap only if she did not receive during her prior pregnancy
C. She should receive Tdap today

Tdap Recommendations

WHO

- All adolescents aged 11 through 18 years (age 11-12 preferred)
- All adults aged 19 through 64 who have not received a dose
- All adults aged ≥ 65 years (2/2012)
- All pregnant women during each pregnancy

WHAT

- Boostrix preferred for adults ≥ 65 years (but either okay)

WHEN

- Regardless of interval between last Td if has not received Tdap
- During each pregnancy for pregnant women – optimum timing is 3rd trimester (27-34 weeks)

MMWR 2013;62:131-135

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Question: Hepatitis A

A couple in their 30's plans to adopt a 2 year old girl from Ethiopia. They have a regular babysitter and another 7 year old child.

Who should receive the Hepatitis A vaccine?

A.Both parents

B.Mother only

C.Both parents and 7 year old child

D.Both parents, 7 year old child, and babysitter

Hepatitis A

- Vaccine recommended for all close personal contacts, including regular babysitters of children adopted from high/intermediate endemic areas
- Timing – ideally at ***least 2 weeks prior to arrival*** of child but within first 60 days of arrival

Hepatitis A

Hepatitis A

- Universal vaccination for children since 2006 (between 12-23 months)
- 3 formulations of vaccine available – Havrix, Vaqta, Twinrix (with Hep B vaccine)
  - Havrix and Vaqta are 2 doses 0, and 6-12 months apart
- Duration of protection is unknown but felt to be lifelong
  - No need to check antibody titers after vaccination
  - Negative titer does not mean lack of immunity

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Hepatitis A Vaccination in Adults

- Travelers
- Men who have sex with men
- Persons who use illicit drugs
- Persons who work with nonhuman primates
- Persons who anticipate close contact with an international adoptee
- Persons with chronic liver disease
- Post-exposure prophylaxis for healthy persons
- **Persons living homeless**

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Question: Travel

27 year old female aid worker for a relief organization is planning a 2 month trip to Nigeria in May. She recently completed graduate school. Prior travel to Brazil for vacation 11 years ago. Vaccine history - received all childhood vaccines and yellow fever vaccine 11 years ago. She should receive the following vaccines:

A. Yellow fever, Hep A, Typhoid, meningococcal, Japanese encephalitis, cholera

B. Hep A, Typhoid, meningococcal, cholera

C. Hep A, Typhoid

D. Yellow fever, Hep A

Yellow Fever

Yellow Fever Vaccine

- Recommended for ≥ 9 months traveling to or living in areas of risk or countries requiring vaccine for entry
- In 2014, WHO concluded that single dose fellow fever vaccine provides lifelong protection and no booster needed
  - Exceptions if ongoing risk and the following
    - pregnant when initially vaccinated
    - underwent HSCT after initial vaccine
    - HIV+

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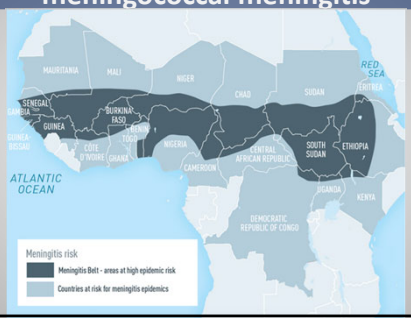
Areas of frequent epidemics of meningococcal meningitis



Meningococcal Vaccine and Travel

- Quadrivalent meningococcal vaccine recommended for travelers to the meningitis belt during dry season (Dec-June)
  - For ages 2 months – 55 years --> MenACWY (conjugate vaccine) recommended
  - For ≥ 56 years who have received conjugate vaccine before, Men ACWY recommended
  - For ≥ 56 years who are vaccine naïve, then MPSV4 (polysaccharide vaccine) recommended
- Meningitis B vaccine not recommended for travel
- Approx 7-10 days after vaccine for the development of protective antibody levels

Meningococcal Vaccine and Travel for Umrah or Hajj

- Travelers to Saudi Arabia for Umrah or Hajj are required to provide documentation of meningococcal vaccination at least 10 days before arrival
  - –No more than 3 years before for polysaccharide vaccine
  - –No more than 9 years before for conjugate

Typhoid Vaccine

- Highest risk for travelers to South Asia (6-30 x more than other destinations)
- Increased risk in West Africa, particularly in rural areas
- 2 vaccines available in US
  - Oral, live attenuated (given at least 1 wk before travel); age 6 and above, q 5 years if ongoing risk or travel
  - IM, polysaccharide (given at least 2 wks before travel); age 2 and above, q 2 years if ongoing risk or travel
  - Both 50-80% effective
- Indicated in travelers
- Delay vaccine >72 hrs after antibacterial medications

Japanese Encephalitis

JEV

- 35,000-50,000 cases/year
- 20-30% mortality
- 30-50% with neurologic sequelae
- Very low risk in travelers *(< 1 case per million travelers)*
- Risks are extended travel > 1 month, rural areas, irrigated areas (rice paddies), or going to an outbreak area
- Vaccine 2 doses, 28 days apart. 2nd dose should be given at least a week prior to travel
- 2 months or older
  - Smaller dose for children under 3
  - ? Booster dose for ≥ 17 years if risk and > 1 year since prior vaccine

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Cholera Vaccine

- Approved in 2016
- Single-dose vaccine recommended for adults 18-64 years travelling to an area of active transmission (where cases have been reported in the past year)
- Cholera in travelers is extremely rare
- Risk factors: aid workers in outbreak settings
- Vaccine 90% effective in preventing severe diarrhea (declined to 80% after 3 month

Question: Travel

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B. Hep A, Typhoid, meningococcal, cholera
C. Hep A, Typhoid
D. Yellow fever, Hep A

Question: Travel

A 30 year old male is planning on traveling to Angola. He presents to a travel clinic prior to travel and receives appropriate vaccines. One week later, he develops fever, ataxia, confusion, and then seizure.

Which vaccine is most likely responsible for this clinical syndrome?

A. Typhoid vaccine
B. Pneumococcal vaccine
C. Yellow fever vaccine
D. Japanese encephalitis
E. Malaria vaccine

Yellow Fever Vaccine

- YEL-AND (yellow fever vaccine associated neurologic disease)
  - Can dx by amplification of vaccine-type virus from CSF
- YEL-AVD (yellow fever vaccine associated viscerotropic disease)
  - Fever, N/V, malaise, myalgia, dyspnea
  - Jaundice, renal/hepatic impairment, rhabdo, decreased platelets, respiratory distress, hypotension, DIC
  - Diagnosis - isolate virus from blood

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Vaccines Post-Exposure

Question: Rabies

A 25 year old spelunker was bitten by a bat 6 days ago. He has never received rabies vaccine in the past.

What do you recommend?

A. Observation as too late to benefit from immunization or immune globulin
B. He should receive HRIG + vaccine today, then in 3, 7, and 14 days (total 4 doses).
C. He should receive HRIG + vaccine today, and day 14 as he is already a week past exposure
D. He should receive HRIG + vaccine today, then in 3, 7, 14, and 28 days (total 5 doses)

Question: Rabies vaccine in previously vaccinated patient

A 25 year old spelunker was bitten by a bat 6 days ago. *He received rabies vaccine series 5 years ago*.

What do you recommend?

A. He does not need HRIG or additional vaccine
B. He does not need HRIG, but should receive vaccine today and in 3 days
C. He should receive HRIG + vaccine today in 3 days
D. He should receive HRIG + vaccine today, then in 3, 7, and 14 days

Rabies

- Nearly uniformly fatal disease, acute, progressive encephalomyelitis
- Incubation period 1-3 months, but can be days to years
- 1-2 cases/year in US since 1960

Rabies Vaccine

- Recommendations revised 3/2010
- Pre-exposure prophylaxis
  - Vaccination on day 0, 7, and 21 OR 28 days
- Post-exposure
  - Vaccination day 0 (ASAP after exposure), 3, 7, 14
  - If received pre-exposure vaccine, should receive 2 doses PEP vaccine (day 0,3)
  - If immunocompromised, 5 doses of vaccine on day 0, 3, 7, 14, 28

Rabies Immune Globulin (HRIG)

- Clean wound
- Full dose around and into the wound (if any remaining, give at site distant from vaccine)
- If pre-vaccinated, no RIG

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Question: Post-Exposure

A 50 year old man living homeless is notified by public health that 2 people living in his tent community were diagnosed with hepatitis A in the last week. He does not know if he has been vaccinated but he is not in routine medical care. He denies any symptoms. Which of the following is most appropriate:

A. He does not need vaccine as he is asymptomatic
B. He should receive Hep A vaccine as soon as possible
C. He should receive combination Hep A and Hep B vaccine as he is likely non-immune to both

Hepatitis A Post-Exposure Prophylaxis

- No PEP needed if healthy and previously vaccinated
- PEP should be given immediately (within 14 days of exposure)
- No data available for combination HepA/HepB vaccine for PEP in HAV outbreak setting (contains only half the Hep A antigen compared to HAV vaccine – so not recommended after exposure)
- If non-immune, should complete 2-dose vaccine series (2nd dose at least 6 months after 1st dose)
- Immune globulin + vaccine (at separate sites) for immunocompromised and those with chronic liver disease
- For infants < 12 months, immune globulin only ASAP (within 2 weeks)

Question: Post-Exposure

A 35 year old man living homeless is notified by public health that 2 people living in is tent community were diagnosed with hepatitis A in the last week. He does not know if he has been vaccinated but he is not in routine medical care. He denies any symptoms. Which of the following is most appropriate:

A. He does not need vaccine as he is asymptomatic
B. He should receive Hep A vaccine as soon as possible
C. He should receive combination Hep A and Hep B vaccine as he is likely non-immune to both

21 – Immunizations: Domestic, Travel, and Occupational-I, II

Speaker: Shireesha Dhanireddy, MD

Vaccines Post-Exposure

- ***Varicella exposure***
  - If no evidence of immunity and no contraindications (ie not severely immunocompromised) → Give vaccine ideally 3-5 days after exposure
  - For non-immune immunocompromised hosts and pregnant women, passive immunization with VariZIG is recommended
- ***Hepatitis B exposure***
  - If unvaccinated or incompletely vaccinated, Hep B vaccine dose + HBIG (can be given at a different injection site) as soon as possible after exposure
- ***Meningococcal exposure***
  - Chemoprophylaxis for close contacts (household members, child-care personnel, persons directly exposed to oral secretions)
  - Vaccination of population in outbreak

Exposure: Anthrax

If exposure to aerosolized *Bacillus anthracis* spores

•60 days of antimicrobial prophylaxis +

•3 doses of anthrax vaccine

Contraindications for vaccine

•Pregnant women when risk of anthrax exposure low

Precautions for use in:

•Individuals with latex allergy

•H/o anthrax

•Immunocompromised individuals

•Moderate to severe illness from anthrax

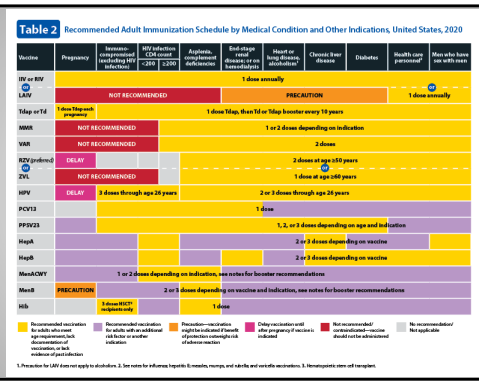

Table 2 Recommended Adult Immunization Schedule by Medical Condition and Other Indications, United States, 2020

Vaccine	Pregnancy	Immunocompromising conditions (including HIV infection)	HIV infection – CD4 count <200	HIV infection – CD4 count ≥200	Asplenia, complement deficiencies	End-stage renal disease, hemodialysis	Heart or lung disease, alcoholism	Chronic liver disease	Diabetes	Health-care personnel	Men who have sex with men
IIV or RIV	1 dose annually										
LAIV	NOT RECOMMENDED				PRECAUTION					1 dose annually	
Tdap or Td	1 dose Tdap each pregnancy	1 dose Tdap, then Td or Tdap booster every 10 years									
MMR	NOT RECOMMENDED	1 or 2 doses depending on indication									
VAR	NOT RECOMMENDED	2 doses									
RZV (preferred)	DELAY	2 doses at age ≥50 years									
ZVL	NOT RECOMMENDED	1 dose at age ≥60 years									
HPV	DELAY	3 doses through age 26 years			2 or 3 doses through age 26 years						
PCV13	1 dose										
PPSV23	1, 2, or 3 doses depending on age and indication										
HepA	2 or 3 doses depending on vaccine										
HepB	2 or 3 doses depending on vaccine										
MenACWY	1 or 2 doses depending on indication, see notes for booster recommendations										
MenB	PRECAUTION	2 or 3 doses depending on vaccine and indication, see notes for booster recommendations									
Hib	3 doses HSCT recipients only	1 dose									

Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or have evidence of past infection | Recommended vaccination for adults with an additional risk factor or another indication | Precaution—vaccination might be indicated if benefit of protection outweighs risk of adverse reaction | Delay vaccination until after pregnancy if vaccine is indicated | Not recommended/contraindicated—vaccine should not be administered | No recommendation/Not applicable

1. Precaution for LAIV does not apply to alcoholism. 2. See notes for influenza; hepatitis B; measles, mumps, and rubella; and varicella vaccinations. 3. Hematopoietic stem cell transplant.

Vaccinations for Immunocompromised Hosts: Levels of Immunosuppression

- ***High-level Immunosuppression***
  - Combined primary immunodeficiency disorder
  - Receiving cancer chemotherapy
  - Within 2 months after SOT
  - HIV with CD4 count < 200 in adolescents/adults and < 15% in children
  - Daily steroid therapy ≥ 20mg (or > 2mg/kg/day for pts < 10kg) of prednisone or equivalent for ≥ 14 days
  - Certain biologic immune modulators or rituximab
  - HSCT (duration of high level immunosuppression variable)
- ***Low-level immunosuppression***
  - Asymptomatic HIV with CD4 count 200-499 for adolescents/adults and 15-24% in children
  - Lower doses of steroids
  - MTX ≤ 0.4mg/kg/week, azathioprine ≤ 3mg/kg/day, 6-mercaptopurine ≤ 1.5mg/kg/day

Vaccinations for Persons with HIV

<u>If CD4 count > 200</u>

Inactivated influenza

Tdap

Pneumococcal

Meningococcal

HBV

HPV

MMR

Varicella

<u>If CD4 count < 200</u>

Inactivated influenza

Tdap

Pneumococcal

Meningococcal

HBV

HPV

~~MMR~~

~~Varicella~~

Vaccinations for Persons with HIV

•Meningococcal vaccine

– 0, 8 weeks; then q5 years thereafter

•Pneumococcal vaccine age 19-64

– PCV13 once, then PPSV23 at least 8 weeks later

– Repeat PPSV23 5 years later

•No recommendations for either zoster vaccine

21 – Immunizations: Domestic, Travel, and Occupational-I, II

Speaker: Shireesha Dhanireddy, MD

Vaccinations for Asplenic Persons

- Live influenza vaccine contraindicated
- Special recommendations
  - Hib (even as adults if not immunized previously or prior to elective splenectomy)
  - MenACWY (q 5 years) and MenB (no recs for booster doses)
  - PCV13 once as adult, followed by PPSV23 at least 8 weeks later; repeat PPSV23 5 years later
- Above vaccines should be given at least 2 weeks prior to elective splenectomy, if possible

Vaccinations for Healthcare Workers

25 year old nursing student is being seen in student health clinic for routine visit. She brings medical records indicating that she received her first dose of hepatitis B vaccine 18 months ago and the second vaccine 1 month thereafter. She asks today if she requires additional doses. No other medical problems and she is not on any other medications.

Which of the following is most appropriate?

A. No additional doses of HBV vaccination needed
B. Restart HBV vaccine series
C. Check hepatitis B surface Ab titer to assess immunity
D. Give 3rd dose of HBV vaccine series today

Vaccines for Healthcare Workers

- Hepatitis B
  - Pre-vaccine serologies not indicated unless born in geographic regions with prevalence ≥ 2%, MSM, PWID, immunosuppressed, liver disease NOS
  - All HCP should be vaccinated with at least 3 doses
  - Should have post-vaccination anti-HBs ≥ 10 mIU/mL (drawn 1-2 months after last dose of vaccine)

Vaccines for Healthcare Workers

Hepatitis B	If you don't have documented evidence of a complete hepB vaccine series, or if you don't have an up-to-date blood test that shows you are immune to hepatitis B (i.e., no serologic evidence of immunity or prior vaccination) then you should • Get the 3-dose series (dose #1 now, #2 in 1 month, #3 approximately 5 months after #2). • Get anti-HBs serologic tested 1–2 months after dose #3.
Flu (Influenza)	Get 1 dose of influenza vaccine annually.
MMR (Measles, Mumps, & Rubella)	If you were born in 1957 or later and have not had the MMR vaccine, or if you don't have an up-to-date blood test that shows you are immune to measles or mumps (i.e., no serologic evidence of immunity or prior vaccination), get 2 doses of MMR (1 dose now and the 2nd dose at least 28 days later). If you were born in 1957 or later and have not had the MMR vaccine, or if you don't have an up-to-date blood test that shows you are immune to rubella, only 1 dose of MMR is recommended. However, you may end up receiving 2 doses, because the rubella component is in the combination vaccine with measles and mumps. For HCWs born before 1957, see the MMR ACIP vaccine recommendations.
Varicella (Chickenpox)	If you have not had chickenpox (varicella), if you haven't had varicella vaccine, or if you don't have an up-to-date blood test that shows you are immune to varicella (i.e., no serologic evidence of immunity or prior vaccination) get 2 doses of varicella vaccine, 4 weeks apart.
Tdap (Tetanus, Diphtheria, Pertussis)	Get a one-time dose of Tdap as soon as possible if you have not received Tdap previously (regardless of when previous dose of Td was received). Get Td boosters every 10 years thereafter. Pregnant HCWs need to get a dose of Tdap during each pregnancy.
Meningococcal	Those who are routinely exposed to isolates of *N. meningitidis* should get one dose.

Resources

- www.cdc.gov/vaccines/recs/ACIP/default.htm
- www.immunize.org/acip

THANK YOU

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