5 Immunizations: Domestic, Travel, and Occupational

Speaker: Shireehsa Dhanireddy, MD

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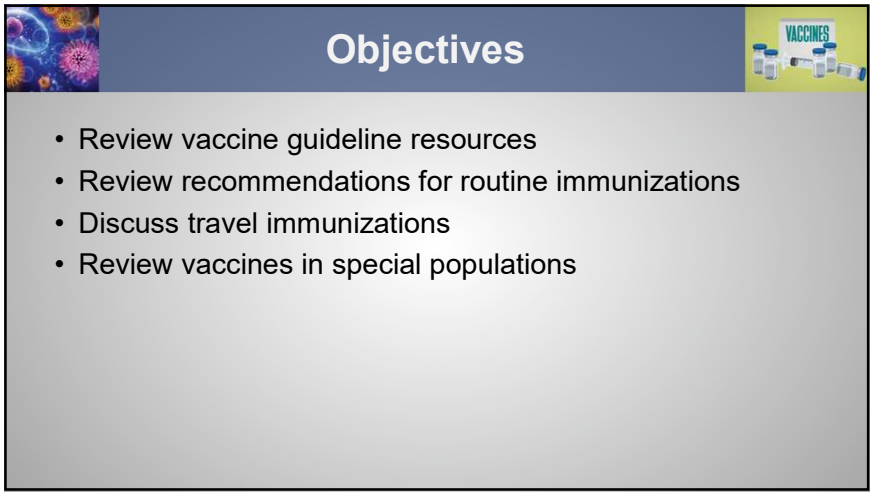

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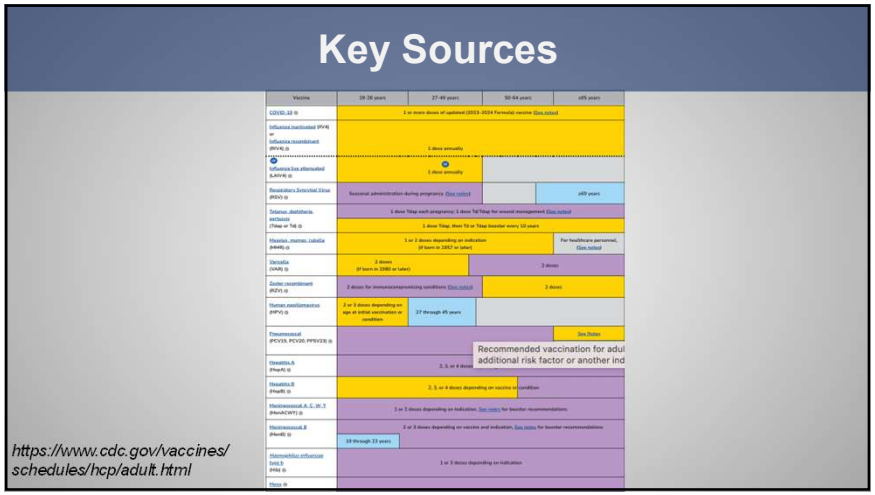

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5 Immunizations: Domestic, Travel, and Occupational

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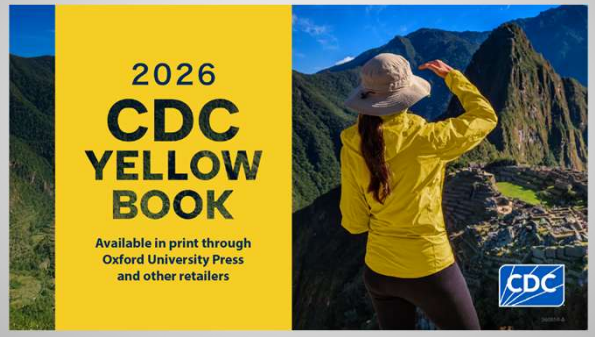
Key Sources

CDC Guidance From Yellow Book For Travel Vaccines



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

5

Question #1

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 additional monitoring
C. Vaccinate and monitor for 30 minutes after receiving any inactivated influenza vaccine
D. Vaccinate with only live attenuated influenza vaccine

6

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

7

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8

5 Immunizations: Domestic, Travel, and Occupational

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Question #2

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

10

Measles in 2025

U.S. Cases in 2025

Total cases

1267

Age
Under 5 years: **360 (28%)**
5-19 years: **464 (37%)**
20+ years: **431 (34%)**
Age unknown: **12 (1%)**

Vaccination Status
Unvaccinated or Unknown: **92%**
One MMR dose: **4%**
Two MMR doses: **4%**

U.S. Hospitalizations in 2025

12%

12% of cases hospitalized (155 of 1267).

Percent of Age Group Hospitalized
Under 5 years: **21% (74 of 360)**
5-19 years: **8% (36 of 464)**
20+ years: **10% (44 of 431)**
Age unknown: **8% (1 of 12)**

U.S. Deaths in 2025

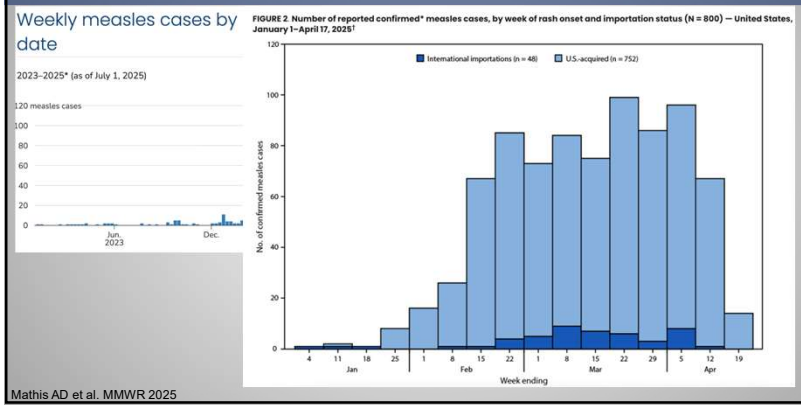
3

There have been 3 confirmed deaths from measles.

Data from CDC of July 1 2025

11

Measles in 2025



Mathis AD et al. MMWR 2025

12

Measles Vaccine & Prevention

Between 1/1/25 and 4/17/25, 800 cases with 85 (11%) hospitalizations

Among hospitalized patients, 66% unvaccinated, 33% unknown vaccine status, 1 patient had received 1 dose of vaccine

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

Post-exposure prophylaxis:
Immune globulin – 76-100% effective
Vaccine – 83-100% effective

Mathis AD et al. MMWR 2025
Montroy J et al. Vaccine 2025

13

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

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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

16

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17

18

Question #3

A 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

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HPV Vaccine

Since 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

20

HPV Vaccine Recommendations

- Routine vaccination at age 11 or 12 years*
- Recommended for everyone through age 26 if not previously vaccinated
- **Vaccine not recommend for everyone older than 26 years**

BUT

- **May consider for ages 27 through 45 through shared decision making**

* Vaccination series may be started at 9 years of age

MMWR 2019;68:698-702

21

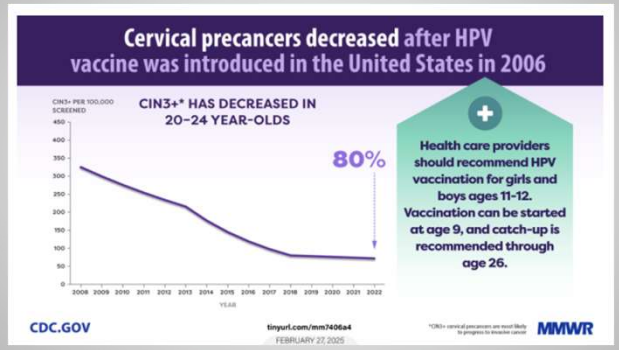
2 Doses Adequate in Some Populations

- 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

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

22

Impact of HPV Vaccination in the US



Gargano et al. MMWR 2025

23

Single-Dose HPV Vaccine

- In US, recommendation remains 2 doses for individuals < 15 years of age
- Many other countries have adopted single dose strategy to increase uptake and decrease cost
- Efficacy equivalent for 1 dose (age 10-18 and 15-year follow-up)
- WHO recommends 1 or 2 doses

Malvi SG et al. JNCI Monographs 2024

24

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25

26

Question #4

A 37-year-old man recently diagnosed with HIV presents to clinic for routine care after starting antiretroviral therapy 3 months ago. He has not received pneumococcal vaccination.

Which of the following is most accurate?

A. He does not need pneumococcal vaccination as he is under 65
B. He needs a PCV20 alone
C. He needs a PCV20 followed 1 year later by a PPSV23
D. He needs a PCV15 followed by PPSV23 1 year later and again in 5 years

27

Pneumococcal Disease

Age (years)	Disease Incidence Cases/100,000 (number of cases)	Death Rate Deaths/100,000 (number of deaths)
<1	17.7 (702)	0.20 (8)
1	12.6 (500)	0.20 (8)
2–4	5.07 (606)	0.13 (16)
5–17	1.23. (659)	0.00 (0)
18–34	2.33 (1,757)	0.08 (60)
35–49	6.48 (3,982)	0.46 (284)
50–64	14.8 (9,326)	1.47 (932)
65–74	18.0 (4,952)	2.17 (597)
75–84	29.0 (4,042)	4.53 (631)
≥85	45.4 (2,856)	11.4 (718)
Total	9.14 (29,382)	1.01 (3,254)

Gierke R et al. CDC Vaccine Preventable Diseases Surveillance Manual

28

Guidelines Updated Jan 2025

- CDC ACIP recommends single dose of PCV for all adults aged ≥ 50 who have not received PCV before or if unknown
- For people at higher risk for invasive disease, give a single dose of PCV 19-49 years (unchanged recommendation)

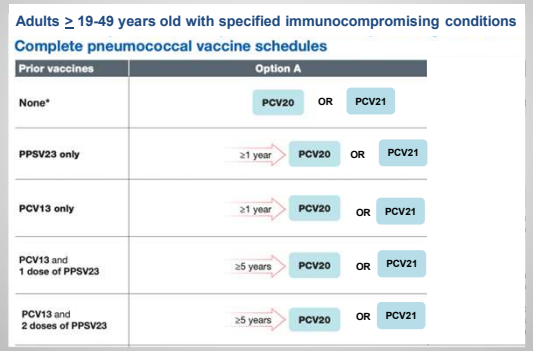
29

Pneumococcal Vaccine in Adults: Who is at Risk?

- Persons ≥ 50 years of age
- Persons age 19-49 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

30

Pneumococcal Vaccine in People with HIV



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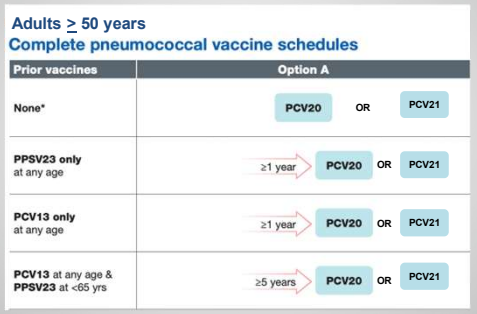
Pneumococcal Vaccine in People with HIV



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33

34

Question #5

A 40-year-old software engineer presents to establish care. She has no medical problems. She is in a mutually monogamous relationship with a cis-male partner. She denies any upcoming foreign travel. She reports she has not received Hep B vaccine in the past.

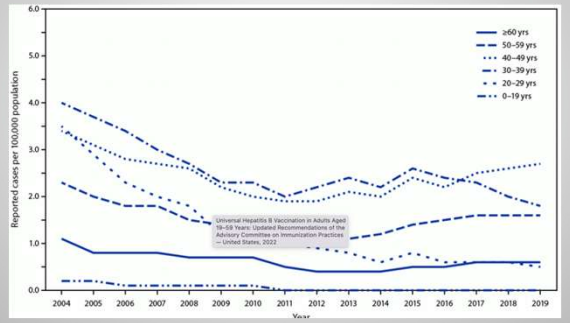
Which of the following is most accurate regarding Hep B vaccination?

A. She should start the series today
B. She should only receive if she has risk factors for Hep B
C. Hep B vaccine is not recommended in individuals her age

35

Hepatitis B

FIGURE. Rates of reported acute hepatitis B virus infection, by age group — United States, 2004–2019



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Hepatitis B Vaccine: Current Recommendations

- All infants
- All persons < 19 years
- All adults 19-59 years
- Adults ≥ 60 years with risk factors for Hep B
- Adults ≥ 60 without known risk factors may receive vaccine

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Hepatitis B Risk Factors

- Sexual exposure
  - Partners with Hep B
  - More than 1 sex partner in last 6 months
  - Getting STI testing or treatment
  - MSM
- Percutaneous exposure (IDU, household contacts, healthcare, public safety, patients on HD or those working with HD patients)
- International travelers
- People with HIV
- Incarceration
- Chronic liver disease (including HCV)

38

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40

Question #6

A 62-year-old woman with a self-reported history of shingles 10 years ago and type II diabetes presents to clinic.

What do you recommend regarding the zoster vaccine?

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

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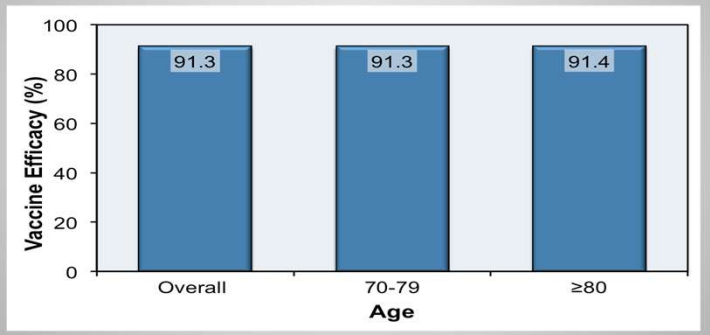
RZV Efficacy Against First Episode of Zoster in Immunocompetent Patients ≥50



Cunningham AL, et al. N Eng J Med. 2016;375:1019-32.

42

ACIP Recommendations for Zoster Vaccine

- RZV is the only vaccine available
- 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

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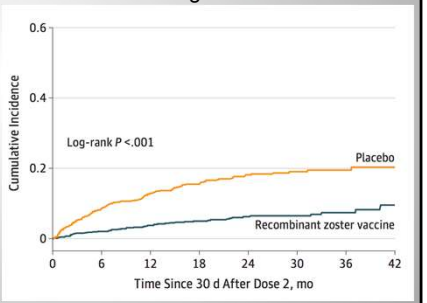
ACIP Recommendations for Zoster Vaccine in Immunocompromised Persons

- RZV recommended for all IC adults 18+
- 2 doses – 2-6 months apart
  - May give 2nd dose early (1-2 months) if anticipating more immunosuppression
  - If second dose early, then repeat dose given at least 4 weeks later
- For those without h/o VZV, RZV not indicated

Efficacy of RZV in Preventing Incident Herpes Zoster in Patients Who Had Undergone HSCT



Source: Bastidas et al. JAMA 2019.

44

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

45

46

Question #7

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.

What should you give?

A. Give meningococcal quadrivalent conjugate vaccine
B. Give meningococcal B vaccine only
C. Give both quadrivalent conjugate and meningococcal B vaccines

47

Meningococcal Vaccines

MenACWY vaccines	• **4 serogroups**: A, C, W, and Y
MenB vaccines	• **1 serogroup**: B
MenABCWY vaccines	• **5 serogroups**: A, B, C, W, and Y

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

- *Menveo* (MenACWY-CRM)
  - Conjugate vaccine
  - Approved for ages 2 to 55 years
  - 2-dose series, 8 weeks apart
- *MenQuadFi* (MenACWY-TT)
  - Polysaccharide tetanus toxoid conjugate vaccine
  - Approved for ages 2 to 55 years
  - Single dose for 2 years or older, booster may be given at least 3 years later if age 13 or older with ongoing risk

49

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

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ACIP Meningococcal B Vaccine Recommendation Adolescents and Young Adults

- Recommended for people 16-23 years of age at increased risk, preferred age 16-18:
  - Meningococcal B outbreak
  - Asplenia
  - Complement deficiency
  - Use of complement inhibitors (ie eculizumab)
  - Microbiologist with potential exposure to *Neisseria meningitidis*
- For others age 16-23, shared decision making recommended
- Same vaccine should be used for all doses

CDC. MMWR. 2020;69:1-41

51

Eculizumab

- Soliris (eculizumab) 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

52

Pentavalent Meningococcal Vaccine

- MenACWY-TT/MenB-FHbp
- FDA approved 10/2023 for persons age 10-25
- ACIP recommendations:
  - Healthy persons 16-23, when shared decision making favor giving MenB and both vaccines are due
  - For persons age ≥ 10 years at increased risk of disease
    - Subsequent MenB vaccine should be the same (i.e., MenB-FHbp (*Trumenba*)

53

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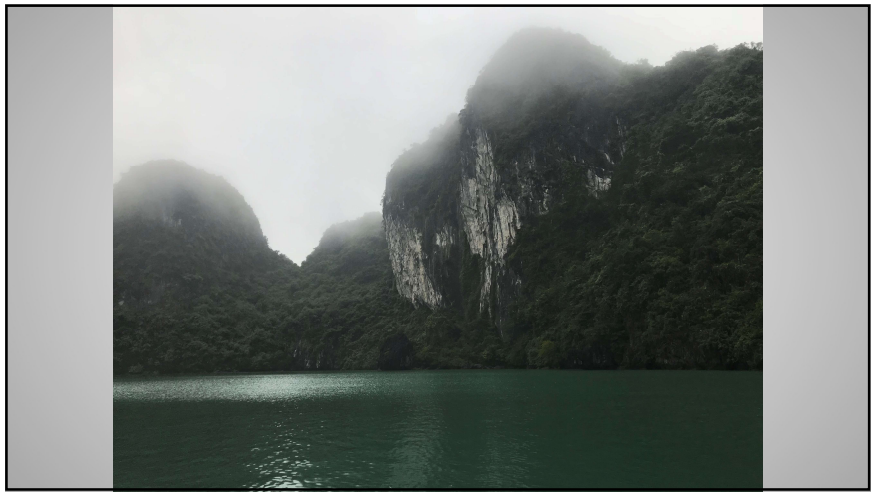
54



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Question #8

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

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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

57

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58

59

Question #9

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

60

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

61

Hepatitis A

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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, except in immunocompromised hosts
  - No clear correlate of immunity

63

Hepatitis A Vaccination in Adults

- **Any person not fully vaccinated who requests vaccination**
- 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**

64

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65

66

Travel Medicine: Scope

- ~20% of all Americans travel abroad per year
- 38 million travel to developing countries per year
- Destinations and itineraries increasingly ambitious
- Average 3 days lost to illness per 14-day trip
- Some of these illnesses may be preventable…

67

Question #10

51-year-old man is planning a 3-week vacation to South Africa, Tanzania, and Kenya in mid August. Prior international travel to Brazil for vacation 11 years ago. Vaccine history - received all childhood vaccines as well as routine adult vaccines. Yellow fever vaccine 11 years ago. He is very concerned about becoming ill during travel and would like all recommended vaccines.

Which of the following vaccines are recommended?

A. Yellow fever, Hep A, Typhoid, Meningococcal, Japanese encephalitis, Cholera, Polio
B. Hep A, Typhoid, Meningococcal, Cholera, Polio
C. Hep A, Typhoid, Polio
D. Yellow fever, Hep A

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Yellow Fever

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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+

70

Areas of Frequent Epidemics of Meningococcal Meningitis

71

Meningococcal Vaccine and Travel

- Quadrivalent meningococcal vaccine recommended for travelers to the meningitis belt during dry season (Dec-June)
  - For ages 2 months and older --> MenACWY (conjugate vaccine) recommended
- Meningitis B vaccine not recommended for travel
- Approx 7-10 days after vaccine for the development of protective antibody levels

72

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

73

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

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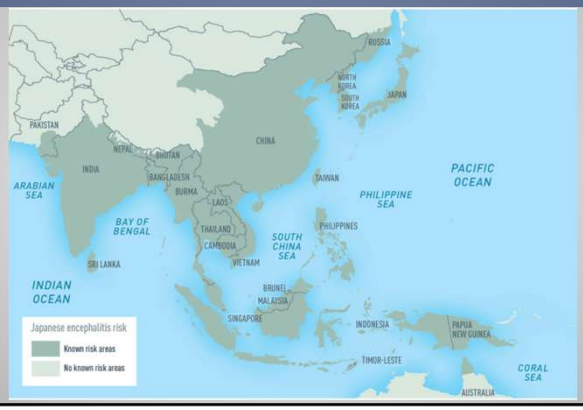
Japanese Encephalitis Virus (JEV)



75

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

76

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 months)

77

Hepatitis A

- "The most frequent vaccine-preventable disease in international travelers"
- 2 doses, at least 6 months apart
- Minimum age: 12 months
- Lifetime protection

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Polio

- WHO's recommends all travelers to polio-affected areas be fully vaccinated against polio
- Visitors for more than 4 weeks should receive an additional dose of vaccine within 4 weeks to 12 months of travel

www.polioeradication.org

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Question #10

51-year-old man is planning a 3-week vacation to South Africa, Tanzania, and Kenya in mid August. Prior international travel to Brazil for vacation 11 years ago. Vaccine history - received all childhood vaccines as well as routine adult vaccines. Yellow fever vaccine 11 years ago. He is very concerned about becoming ill during travel and would like all recommended vaccines.

Which of the following vaccines are recommended?

A. Yellow fever, Hep A, Typhoid, Meningococcal, Japanese encephalitis, Cholera, Polio
B. Hep A, Typhoid, Meningococcal, Cholera, Polio
C. **Hep A, Typhoid, Polio**
D. Yellow fever, Hep A

80

Question #11

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 vaccine
E. Malaria vaccine

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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

85

86

Question #12

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)

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Question #13

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

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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
- 25 cases between 2009-2018 (7 contracted outside US)

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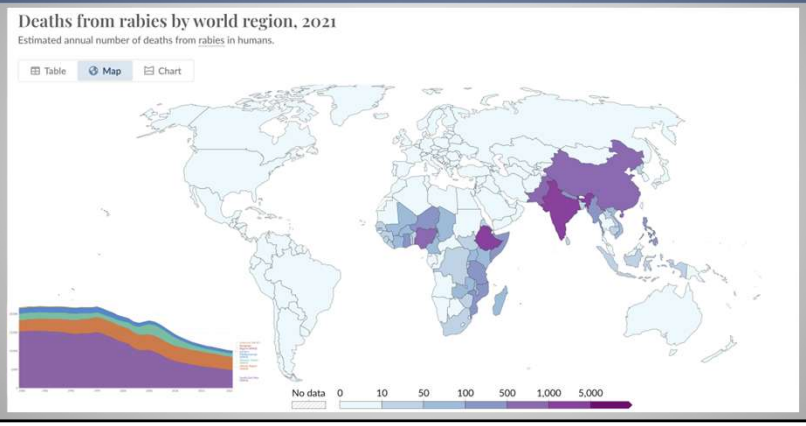
Human Deaths Attributed to Rabies, 2021



90

Rabies Vaccine

- Pre-exposure prophylaxis – updated February 2021
  - Vaccination on day 0, 7, ~~and 21 OR 28 days~~

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Rabies Vaccine

- 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

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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

93

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95

Question #14

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

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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)

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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

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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

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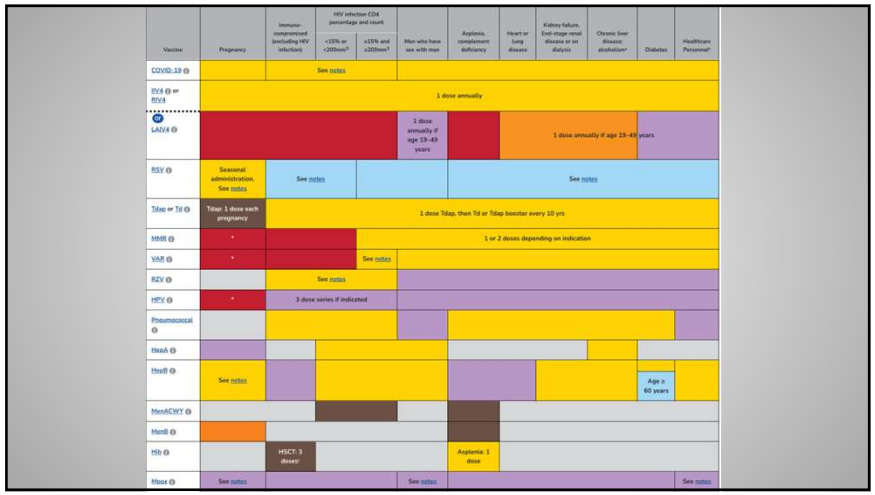
5 Immunizations: Domestic, Travel, and Occupational

Speaker: Shireehsa Dhanireddy, MD



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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

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Vaccinations for Persons with HIV

If CD4 count > 200	**If CD4 count < 200**
Inactivated influenza	Inactivated influenza
Tdap	Tdap
Pneumococcal	Pneumococcal
Meningococcal	Meningococcal
HBV	HBV
HPV	HPV
MMR	MMR
Varicella	Varicella

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Vaccinations for Persons with HIV

- Meningococcal vaccine
  - 0, 8 weeks; then q5 years thereafter
- Pneumococcal vaccine age 19-64
  - PCV20 or PCV15 once, if PCV15 given, then PPSV23 at least 8 weeks later, no recommendation for repeat doses
- Recombinant zoster vaccine (2 doses, 0 and 8 weeks) recommended for all persons with HIV age 18+

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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)
  - PCV20 or PCV15 once as adult, if PCV15 given then PPSV23 at least 8 weeks later
- Above vaccines should be given at least 2 weeks prior to elective splenectomy, if possible

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Question #15

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

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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)

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Post-Vaccine HBV Serologies

- Serologic testing not necessary after routine vaccination of infants, children, or adults
- Anti-HBs recommended for the following:
  - Infants born to HBsAg–positive or unknown mothers (check HBsAb and sAg)
  - Health care personnel and public safety workers
  - Hemodialysis patients
  - Persons with HIV
  - Other immunocompromised persons (e.g., hematopoietic stem-cell transplant recipients or persons receiving chemotherapy)
  - Sex partners of HBsAg-positive persons

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Resources

- https://www.cdc.gov/acip/vaccine-recommendations/index.html
- www.immunize.org/acip

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