# MAIC 2019 Conference – April 2, 2019

# "Improving Immunization Coverage in High-Risk Populations to Reduce Health Disparities"

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Leading Internal Medicine, Improving Lives

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Elisa Choi, MD, FACP

Has no relationships with any entity producing, marketing, re-selling, or distributing health care goods or services consumed by, or used on, patients.

- I, Elisa Choi, MD, FACP, have been asked to disclose any significant relationships with commercial entities that are either providing financial support for this program or whose products or services are mentioned during our presentations.
  - I have no relationships to disclose.
- I may/will discuss the use of vaccines in a manner not approved by the U.S. Food and Drug Administration.
  - But in accordance with ACIP recommendations

# Outline

- Hepatitis B
- HPV (human papillomavirus)
- Hepatitis A
- Meningococcal
- Action steps – improving adult vaccination rates

# Adult immunizations

- Vaccinations are not just for children!
- Cost effective medicine (recent tetanus case)*
- Cancer prevention
- Health disparities reduction




*Notes from the Field:* Tetanus in an Unvaccinated Child — Oregon, 2017 *Weekly* / March 8, 2019 / 68(9);231–232

# Adult vaccination schedule – age group

**Table 1** Recommended Adult Immunization Schedule by Age Group
United States, 2019

| Vaccine | 19–21 years | 22–26 years | 27–49 years | 50–64 years | ≥65 years |
|---|---|---|---|---|---|
| Influenza inactivated (IIV) or Influenza recombinant (RIV) | 1 dose annually | | | | |
| or Influenza live attenuated (LAIV) | or 1 dose annually | | | | |
| Tetanus, diphtheria, pertussis (Tdap or Td) | 1 dose Tdap, then Td booster every 10 yrs | | | | |
| Measles, mumps, rubella (MMR) | 1 or 2 doses depending on indication (if born in 1957 or later) | | | | |
| Varicella (VAR) | 2 doses (if born in 1980 or later) | | | | |
| Zoster recombinant (RZV) (*preferred*) | | | | 2 doses | |
| or Zoster live (ZVL) | | | | or 1 dose | |
| Human papillomavirus (HPV) Female | 2 or 3 doses depending on age at initial vaccination | | | | |
| Human papillomavirus (HPV) Male | 2 or 3 doses depending on | age at initial vaccination | | | |
| Pneumococcal conjugate (PCV13) | 1 dose | | | | |
| Pneumococcal polysaccharide (PPSV23) | 1 or 2 doses depending on indication | | | | 1 dose |
| Hepatitis A (HepA) | 2 or 3 doses depending on vaccine | | | | |
| Hepatitis B (HepB) | 2 or 3 doses depending on vaccine | | | | |
| Meningococcal A, C, W, Y (MenACWY) | 1 or 2 doses depending on indication, then booster every 5 yrs if risk remains | | | | |
| Meningococcal B (MenB) | 2 or 3 doses depending on vaccine and indication | | | | |
| *Haemophilus influenzae* type b (Hib) | 1 or 3 doses depending on indication | | | | |

Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection

Recommended vaccination for adults with an additional risk factor or another indication

No recommendation

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Kim DK, Hunter P; Ann Intern Med. 2019;170:182-92. doi:10.7326/M18-3600

# Adult vaccination schedule – medical condition

**Table 2** Recommended Adult Immunization Schedule by Medical Condition and Other Indications, United States, 2019

| Vaccine | Pregnancy | Immuno-compromised (excluding HIV infection) | HIV infection CD4 count <200 | HIV infection CD4 count ≥200 | Asplenia, complement deficiencies | End-stage renal disease, on hemodialysis | Heart or lung disease, alcoholism[1] | Chronic liver disease | Diabetes | Health care personnel[2] | Men who have sex with men |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IIV or RIV | 1 dose annually | | | | | | | | | | |
| or LAIV | CONTRAINDICATED | | | | | PRECAUTION | | | | or 1 dose annually | |
| Tdap or Td | 1 dose Tdap each pregnancy | 1 dose Tdap, then Td booster every 10 yrs | | | | | | | | | |
| MMR | CONTRAINDICATED | 1 or 2 doses depending on indication | | | | | | | | | |
| VAR | CONTRAINDICATED | 2 doses | | | | | | | | | |
| RZV (*preferred*) | DELAY | 2 doses at age ≥50 yrs | | | | | | | | | |
| or ZVL | CONTRAINDICATED | or 1 dose at age ≥60 yrs | | | | | | | | | |
| HPV Female | DELAY | 3 doses through age 26 yrs | | | 2 or 3 doses through age 26 yrs | | | | | | |
| HPV Male | | 3 doses through age 26 yrs | | | 2 or 3 doses through age 21 yrs | | | | | | 2 or 3 doses through age 26 yrs |
| 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, then booster every 5 yrs if risk remains | | | | | | | | | | |
| MenB | PRECAUTION | 2 or 3 doses depending on vaccine and indication | | | | | | | | | |
| Hib | | 3 doses HSCT[3] recipients only | | | 1 dose | | | | | | |

Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection

Recommended vaccination for adults with an additional risk factor or another indication

Precaution—vaccine might be indicated if benefit of protection outweighs risk of adverse reaction

Delay vaccination until after pregnancy if vaccine is indicated

Contraindicated—vaccine should not be administered because of risk for serious adverse reaction

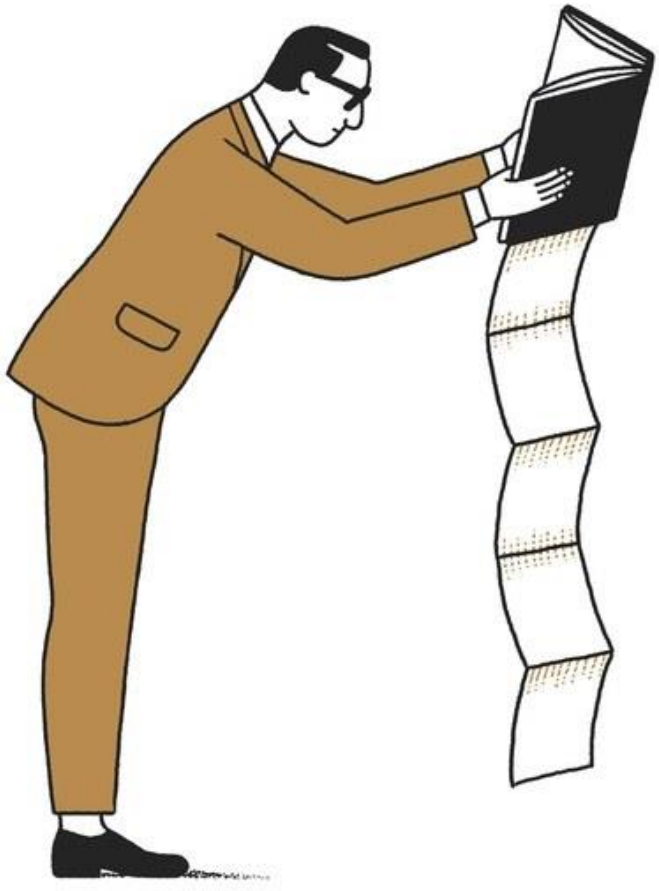
No recommendation

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.

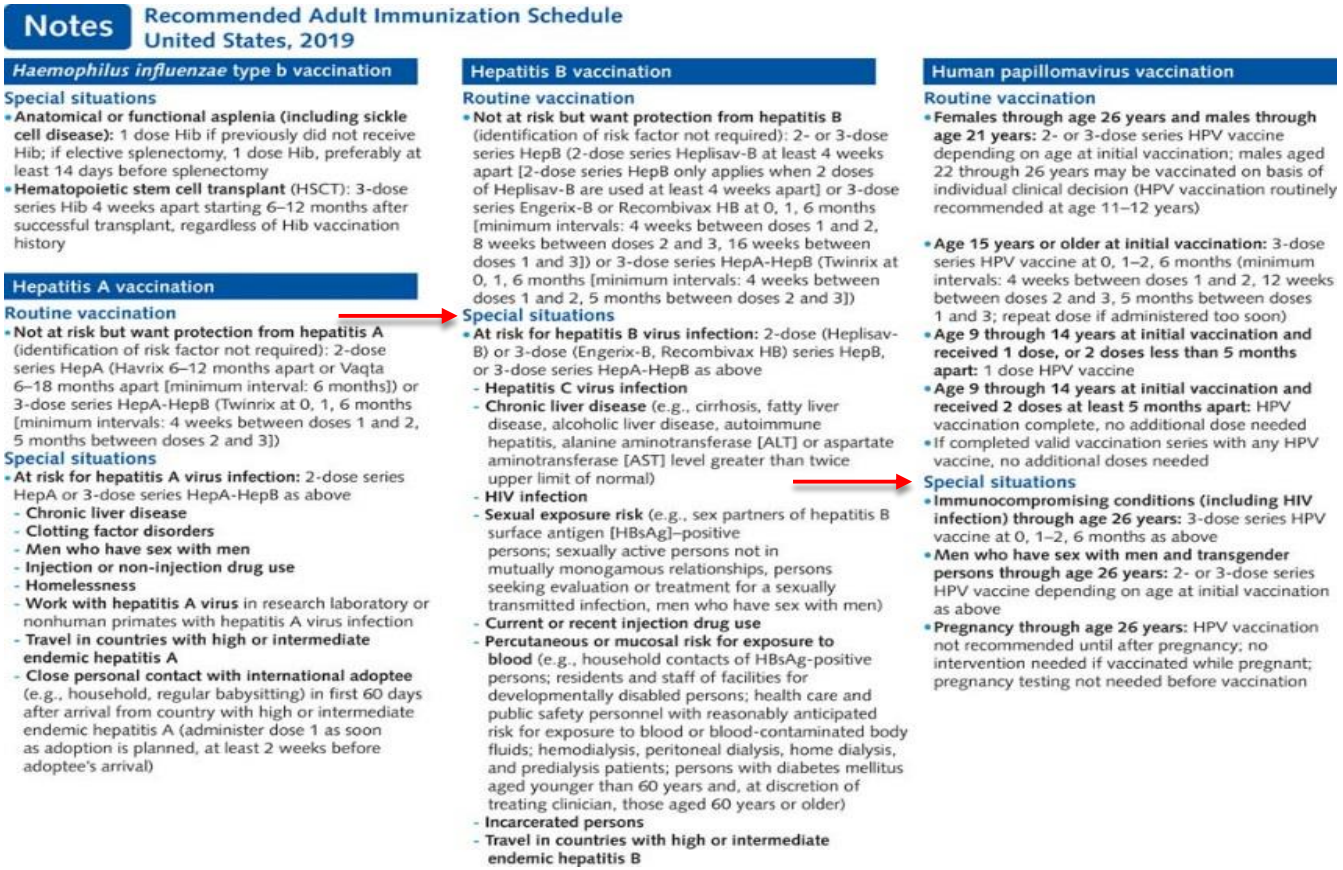


Kim DK, Hunter P; Ann Intern Med. 2019;170:182-92. doi:10.7326/M18-3600

# Don’t forget to read the “footnotes”



# Adult vaccination schedule – "footnotes"



**Notes** Recommended Adult Immunization Schedule United States, 2019

### *Haemophilus influenzae* type b vaccination

**Special situations**

- **Anatomical or functional asplenia (including sickle cell disease):** 1 dose Hib if previously did not receive Hib; if elective splenectomy, 1 dose Hib, preferably at least 14 days before splenectomy
- **Hematopoietic stem cell transplant** (HSCT): 3-dose series Hib 4 weeks apart starting 6–12 months after successful transplant, regardless of Hib vaccination history

### Hepatitis A vaccination

**Routine vaccination**

- **Not at risk but want protection from hepatitis A** (identification of risk factor not required): 2-dose series HepA (Havrix 6–12 months apart or Vaqta 6–18 months apart [minimum interval: 6 months]) or 3-dose series HepA-HepB (Twinrix at 0, 1, 6 months [minimum intervals: 4 weeks between doses 1 and 2, 5 months between doses 2 and 3])

**Special situations**

- **At risk for hepatitis A virus infection:** 2-dose series HepA or 3-dose series HepA-HepB as above
  - **Chronic liver disease**
  - **Clotting factor disorders**
  - **Men who have sex with men**
  - **Injection or non-injection drug use**
  - **Homelessness**
  - **Work with hepatitis A virus** in research laboratory or nonhuman primates with hepatitis A virus infection
  - **Travel in countries with high or intermediate endemic hepatitis A**
  - **Close personal contact with international adoptee** (e.g., household, regular babysitting) in first 60 days after arrival from country with high or intermediate endemic hepatitis A (administer dose 1 as soon as adoption is planned, at least 2 weeks before adoptee's arrival)

### Hepatitis B vaccination

**Routine vaccination**

- **Not at risk but want protection from hepatitis B** (identification of risk factor not required): 2- or 3-dose series HepB (2-dose series Heplisav-B at least 4 weeks apart [2-dose series HepB only applies when 2 doses of Heplisav-B are used at least 4 weeks apart] or 3-dose series Engerix-B or Recombivax HB at 0, 1, 6 months [minimum intervals: 4 weeks between doses 1 and 2, 8 weeks between doses 2 and 3, 16 weeks between doses 1 and 3]) or 3-dose series HepA-HepB (Twinrix at 0, 1, 6 months [minimum intervals: 4 weeks between doses 1 and 2, 5 months between doses 2 and 3])

**Special situations**

- **At risk for hepatitis B virus infection:** 2-dose (Heplisav-B) or 3-dose (Engerix-B, Recombivax HB) series HepB, or 3-dose series HepA-HepB as above
  - **Hepatitis C virus infection**
  - **Chronic liver disease** (e.g., cirrhosis, fatty liver disease, alcoholic liver disease, autoimmune hepatitis, alanine aminotransferase [ALT] or aspartate aminotransferase [AST] level greater than twice upper limit of normal)
  - **HIV infection**
  - **Sexual exposure risk** (e.g., sex partners of hepatitis B surface antigen [HBsAg]–positive persons; sexually active persons not in mutually monogamous relationships, persons seeking evaluation or treatment for a sexually transmitted infection, men who have sex with men)
  - **Current or recent injection drug use**
  - **Percutaneous or mucosal risk for exposure to blood** (e.g., household contacts of HBsAg-positive persons; residents and staff of facilities for developmentally disabled persons; health care and public safety personnel with reasonably anticipated risk for exposure to blood or blood-contaminated body fluids; hemodialysis, peritoneal dialysis, home dialysis, and predialysis patients; persons with diabetes mellitus aged younger than 60 years and, at discretion of treating clinician, those aged 60 years or older)
  - **Incarcerated persons**
  - **Travel in countries with high or intermediate endemic hepatitis B**

### Human papillomavirus vaccination

**Routine vaccination**

- **Females through age 26 years and males through age 21 years:** 2- or 3-dose series HPV vaccine depending on age at initial vaccination; males aged 22 through 26 years may be vaccinated on basis of individual clinical decision (HPV vaccination routinely recommended at age 11–12 years)
- **Age 15 years or older at initial vaccination:** 3-dose series HPV vaccine at 0, 1–2, 6 months (minimum intervals: 4 weeks between doses 1 and 2, 12 weeks between doses 2 and 3, 5 months between doses 1 and 3; repeat dose if administered too soon)
- **Age 9 through 14 years at initial vaccination and received 1 dose, or 2 doses less than 5 months apart:** 1 dose HPV vaccine
- **Age 9 through 14 years at initial vaccination and received 2 doses at least 5 months apart:** HPV vaccination complete, no additional dose needed
- If completed valid vaccination series with any HPV vaccine, no additional doses needed

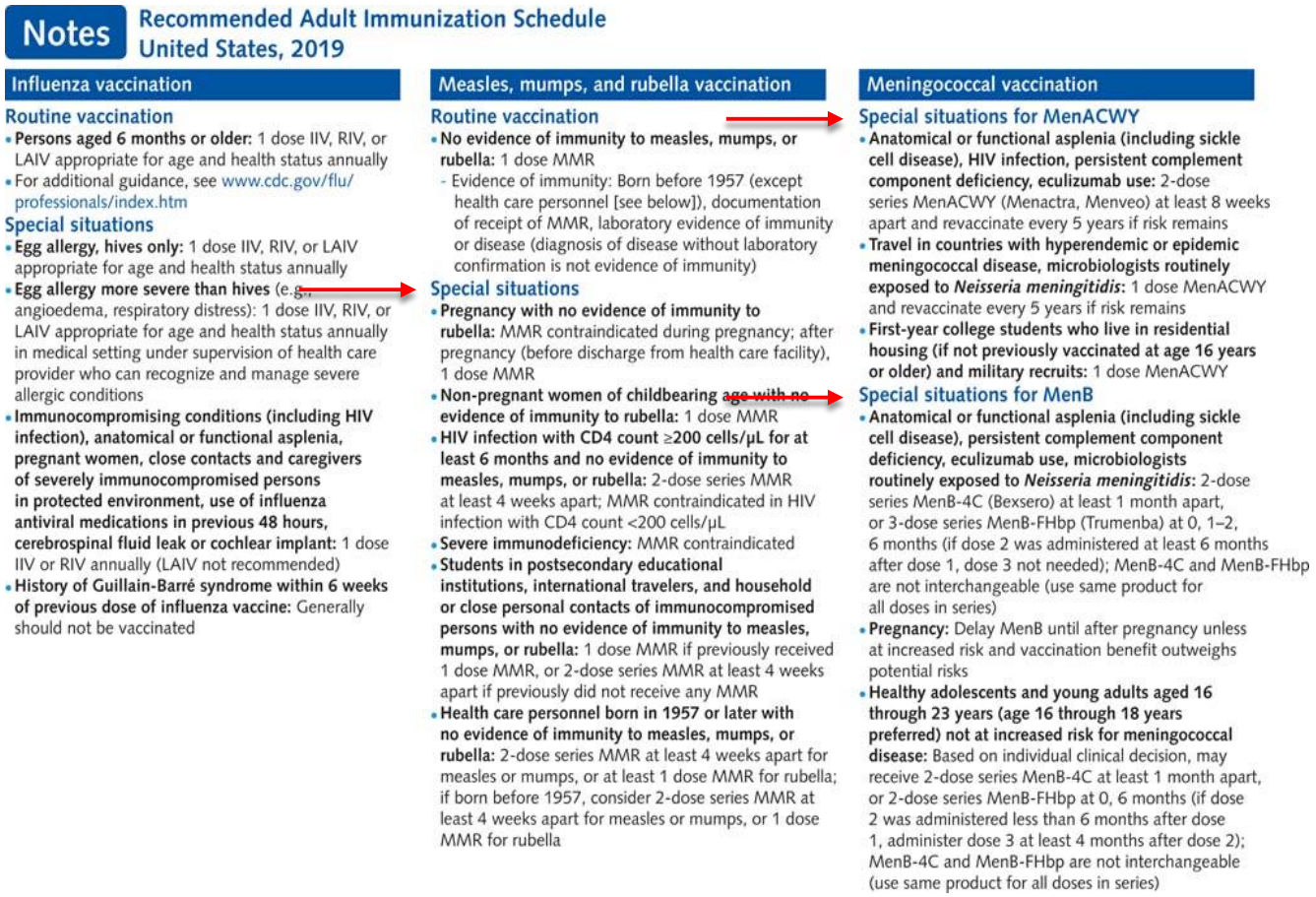
**Special situations**

- **Immunocompromising conditions (including HIV infection) through age 26 years:** 3-dose series HPV vaccine at 0, 1–2, 6 months as above
- **Men who have sex with men and transgender persons through age 26 years:** 2- or 3-dose series HPV vaccine depending on age at initial vaccination as above
- **Pregnancy through age 26 years:** HPV vaccination not recommended until after pregnancy; no intervention needed if vaccinated while pregnant; pregnancy testing not needed before vaccination



Kim DK, Hunter P; Ann Intern Med. 2019;170:182-92. doi:10.7326/M18-3600

# Adult vaccination schedule – "footnotes"



**Notes** Recommended Adult Immunization Schedule United States, 2019

### Influenza vaccination

**Routine vaccination**

- **Persons aged 6 months or older:** 1 dose IIV, RIV, or LAIV appropriate for age and health status annually
- For additional guidance, see www.cdc.gov/flu/professionals/index.htm

**Special situations**

- **Egg allergy, hives only:** 1 dose IIV, RIV, or LAIV appropriate for age and health status annually
- **Egg allergy more severe than hives** (e.g., angioedema, respiratory distress): 1 dose IIV, RIV, or LAIV appropriate for age and health status annually in medical setting under supervision of health care provider who can recognize and manage severe allergic conditions
- **Immunocompromising conditions (including HIV infection), anatomical or functional asplenia, pregnant women, close contacts and caregivers of severely immunocompromised persons in protected environment, use of influenza antiviral medications in previous 48 hours, cerebrospinal fluid leak or cochlear implant:** 1 dose IIV or RIV annually (LAIV not recommended)
- **History of Guillain-Barré syndrome within 6 weeks of previous dose of influenza vaccine:** Generally should not be vaccinated

### Measles, mumps, and rubella vaccination

**Routine vaccination**

- **No evidence of immunity to measles, mumps, or rubella:** 1 dose MMR
  - Evidence of immunity: Born before 1957 (except health care personnel [see below]), documentation of receipt of MMR, laboratory evidence of immunity or disease (diagnosis of disease without laboratory confirmation is not evidence of immunity)

**Special situations**

- **Pregnancy with no evidence of immunity to rubella:** MMR contraindicated during pregnancy; after pregnancy (before discharge from health care facility), 1 dose MMR
- **Non-pregnant women of childbearing age with no evidence of immunity to rubella:** 1 dose MMR
- **HIV infection with CD4 count ≥200 cells/μL for at least 6 months and no evidence of immunity to measles, mumps, or rubella:** 2-dose series MMR at least 4 weeks apart; MMR contraindicated in HIV infection with CD4 count <200 cells/μL
- **Severe immunodeficiency:** MMR contraindicated
- **Students in postsecondary educational institutions, international travelers, and household or close personal contacts of immunocompromised persons with no evidence of immunity to measles, mumps, or rubella:** 1 dose MMR if previously received 1 dose MMR, or 2-dose series MMR at least 4 weeks apart if previously did not receive any MMR
- **Health care personnel born in 1957 or later with no evidence of immunity to measles, mumps, or rubella:** 2-dose series MMR at least 4 weeks apart for measles or mumps, or at least 1 dose MMR for rubella; if born before 1957, consider 2-dose series MMR at least 4 weeks apart for measles or mumps, or 1 dose MMR for rubella

### Meningococcal vaccination

**Special situations for MenACWY**

- **Anatomical or functional asplenia (including sickle cell disease), HIV infection, persistent complement component deficiency, eculizumab use:** 2-dose series MenACWY (Menactra, Menveo) at least 8 weeks apart and revaccinate every 5 years if risk remains
- **Travel in countries with hyperendemic or epidemic meningococcal disease, microbiologists routinely exposed to *Neisseria meningitidis*:** 1 dose MenACWY and revaccinate every 5 years if risk remains
- **First-year college students who live in residential housing (if not previously vaccinated at age 16 years or older) and military recruits:** 1 dose MenACWY

**Special situations for MenB**

- **Anatomical or functional asplenia (including sickle cell disease), persistent complement component deficiency, eculizumab use, microbiologists routinely exposed to *Neisseria meningitidis*:** 2-dose series MenB-4C (Bexsero) at least 1 month apart, or 3-dose series MenB-FHbp (Trumenba) at 0, 1–2, 6 months (if dose 2 was administered at least 6 months after dose 1, dose 3 not needed); MenB-4C and MenB-FHbp are not interchangeable (use same product for all doses in series)
- **Pregnancy:** Delay MenB until after pregnancy unless at increased risk and vaccination benefit outweighs potential risks
- **Healthy adolescents and young adults aged 16 through 23 years (age 16 through 18 years preferred) not at increased risk for meningococcal disease:** Based on individual clinical decision, may receive 2-dose series MenB-4C at least 1 month apart, or 2-dose series MenB-FHbp at 0, 6 months (if dose 2 was administered less than 6 months after dose 1, administer dose 3 at least 4 months after dose 2); MenB-4C and MenB-FHbp are not interchangeable (use same product for all doses in series)



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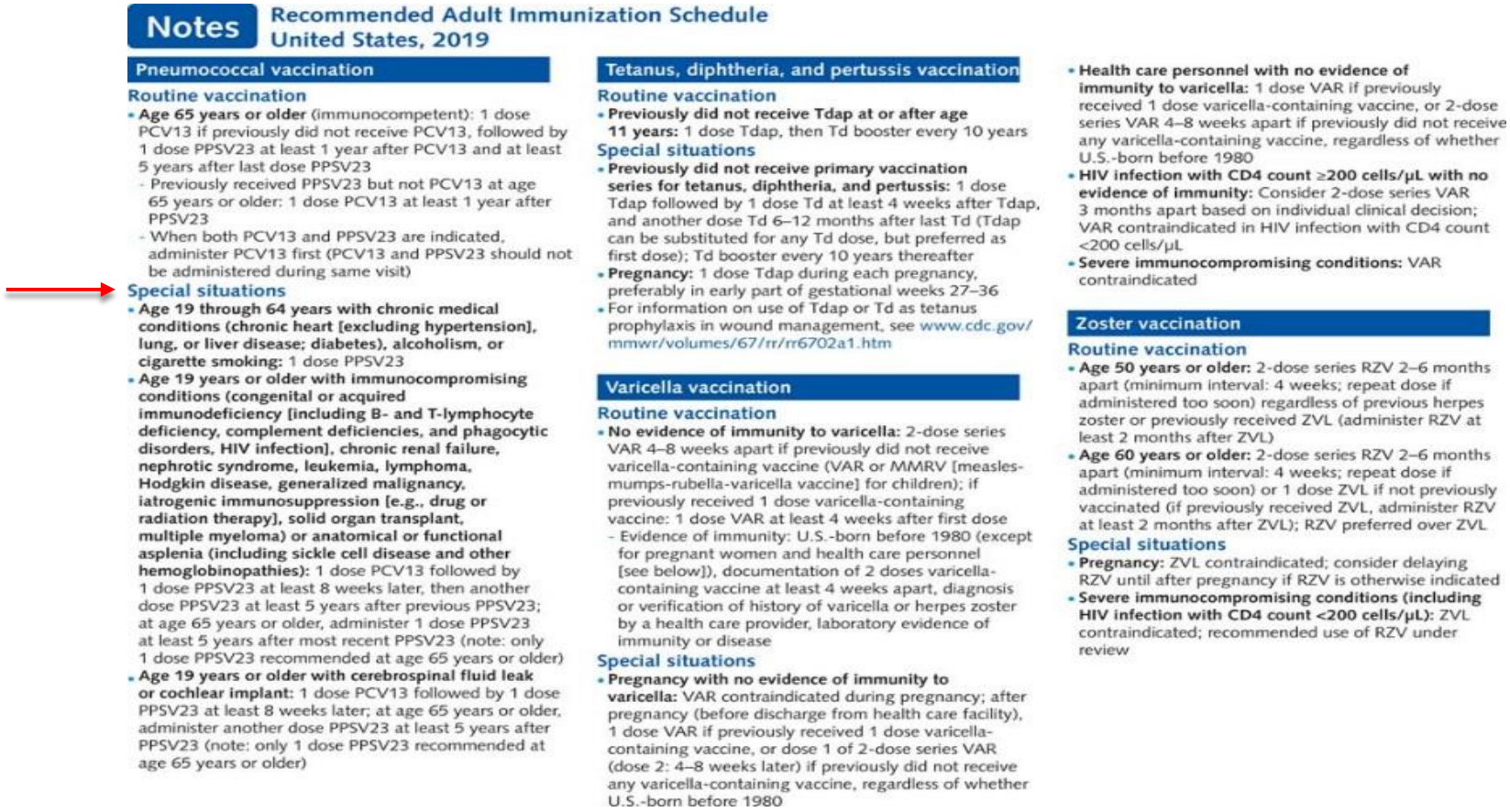
# Adult vaccination schedule – "footnotes"



**Notes** Recommended Adult Immunization Schedule United States, 2019

**Pneumococcal vaccination**

**Routine vaccination**

- **Age 65 years or older** (immunocompetent): 1 dose PCV13 if previously did not receive PCV13, followed by 1 dose PPSV23 at least 1 year after PCV13 and at least 5 years after last dose PPSV23
  - Previously received PPSV23 but not PCV13 at age 65 years or older: 1 dose PCV13 at least 1 year after PPSV23
  - When both PCV13 and PPSV23 are indicated, administer PCV13 first (PCV13 and PPSV23 should not be administered during same visit)

**Special situations**

- **Age 19 through 64 years with chronic medical conditions (chronic heart [excluding hypertension], lung, or liver disease; diabetes), alcoholism, or cigarette smoking:** 1 dose PPSV23
- **Age 19 years or older with immunocompromising conditions (congenital or acquired immunodeficiency [including B- and T-lymphocyte deficiency, complement deficiencies, and phagocytic disorders, HIV infection], chronic renal failure, nephrotic syndrome, leukemia, lymphoma, Hodgkin disease, generalized malignancy, iatrogenic immunosuppression [e.g., drug or radiation therapy], solid organ transplant, multiple myeloma) or anatomical or functional asplenia (including sickle cell disease and other hemoglobinopathies):** 1 dose PCV13 followed by 1 dose PPSV23 at least 8 weeks later, then another dose PPSV23 at least 5 years after previous PPSV23; at age 65 years or older, administer 1 dose PPSV23 at least 5 years after most recent PPSV23 (note: only 1 dose PPSV23 recommended at age 65 years or older)
- **Age 19 years or older with cerebrospinal fluid leak or cochlear implant:** 1 dose PCV13 followed by 1 dose PPSV23 at least 8 weeks later; at age 65 years or older, administer another dose PPSV23 at least 5 years after PPSV23 (note: only 1 dose PPSV23 recommended at age 65 years or older)

**Tetanus, diphtheria, and pertussis vaccination**

**Routine vaccination**

- **Previously did not receive Tdap at or after age 11 years:** 1 dose Tdap, then Td booster every 10 years

**Special situations**

- **Previously did not receive primary vaccination series for tetanus, diphtheria, and pertussis:** 1 dose Tdap followed by 1 dose Td at least 4 weeks after Tdap, and another dose Td 6–12 months after last Td (Tdap can be substituted for any Td dose, but preferred as first dose); Td booster every 10 years thereafter
- **Pregnancy:** 1 dose Tdap during each pregnancy, preferably in early part of gestational weeks 27–36
- For information on use of Tdap or Td as tetanus prophylaxis in wound management, see www.cdc.gov/mmwr/volumes/67/rr/rr6702a1.htm

**Varicella vaccination**

**Routine vaccination**

- **No evidence of immunity to varicella:** 2-dose series VAR 4–8 weeks apart if previously did not receive varicella-containing vaccine (VAR or MMRV [measles-mumps-rubella-varicella vaccine] for children); if previously received 1 dose varicella-containing vaccine: 1 dose VAR at least 4 weeks after first dose
  - Evidence of immunity: U.S.-born before 1980 (except for pregnant women and health care personnel [see below]), documentation of 2 doses varicella-containing vaccine at least 4 weeks apart, diagnosis or verification of history of varicella or herpes zoster by a health care provider, laboratory evidence of immunity or disease

**Special situations**

- **Pregnancy with no evidence of immunity to varicella:** VAR contraindicated during pregnancy; after pregnancy (before discharge from health care facility), 1 dose VAR if previously received 1 dose varicella-containing vaccine, or dose 1 of 2-dose series VAR (dose 2: 4–8 weeks later) if previously did not receive any varicella-containing vaccine, regardless of whether U.S.-born before 1980
- **Health care personnel with no evidence of immunity to varicella:** 1 dose VAR if previously received 1 dose varicella-containing vaccine, or 2-dose series VAR 4–8 weeks apart if previously did not receive any varicella-containing vaccine, regardless of whether U.S.-born before 1980
- **HIV infection with CD4 count ≥200 cells/μL with no evidence of immunity:** Consider 2-dose series VAR 3 months apart based on individual clinical decision; VAR contraindicated in HIV infection with CD4 count <200 cells/μL
- **Severe immunocompromising conditions:** VAR contraindicated

**Zoster vaccination**

**Routine vaccination**

- **Age 50 years or older:** 2-dose series RZV 2–6 months apart (minimum interval: 4 weeks; repeat dose if administered too soon) regardless of previous herpes zoster or previously received ZVL (administer RZV at least 2 months after ZVL)
- **Age 60 years or older:** 2-dose series RZV 2–6 months apart (minimum interval: 4 weeks; repeat dose if administered too soon) or 1 dose ZVL if not previously vaccinated (if previously received ZVL, administer RZV at least 2 months after ZVL); RZV preferred over ZVL

**Special situations**

- **Pregnancy:** ZVL contraindicated; consider delaying RZV until after pregnancy if RZV is otherwise indicated
- **Severe immunocompromising conditions (including HIV infection with CD4 count <200 cells/μL):** ZVL contraindicated; recommended use of RZV under review



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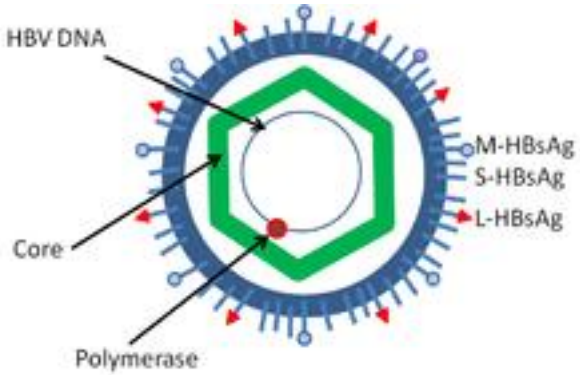
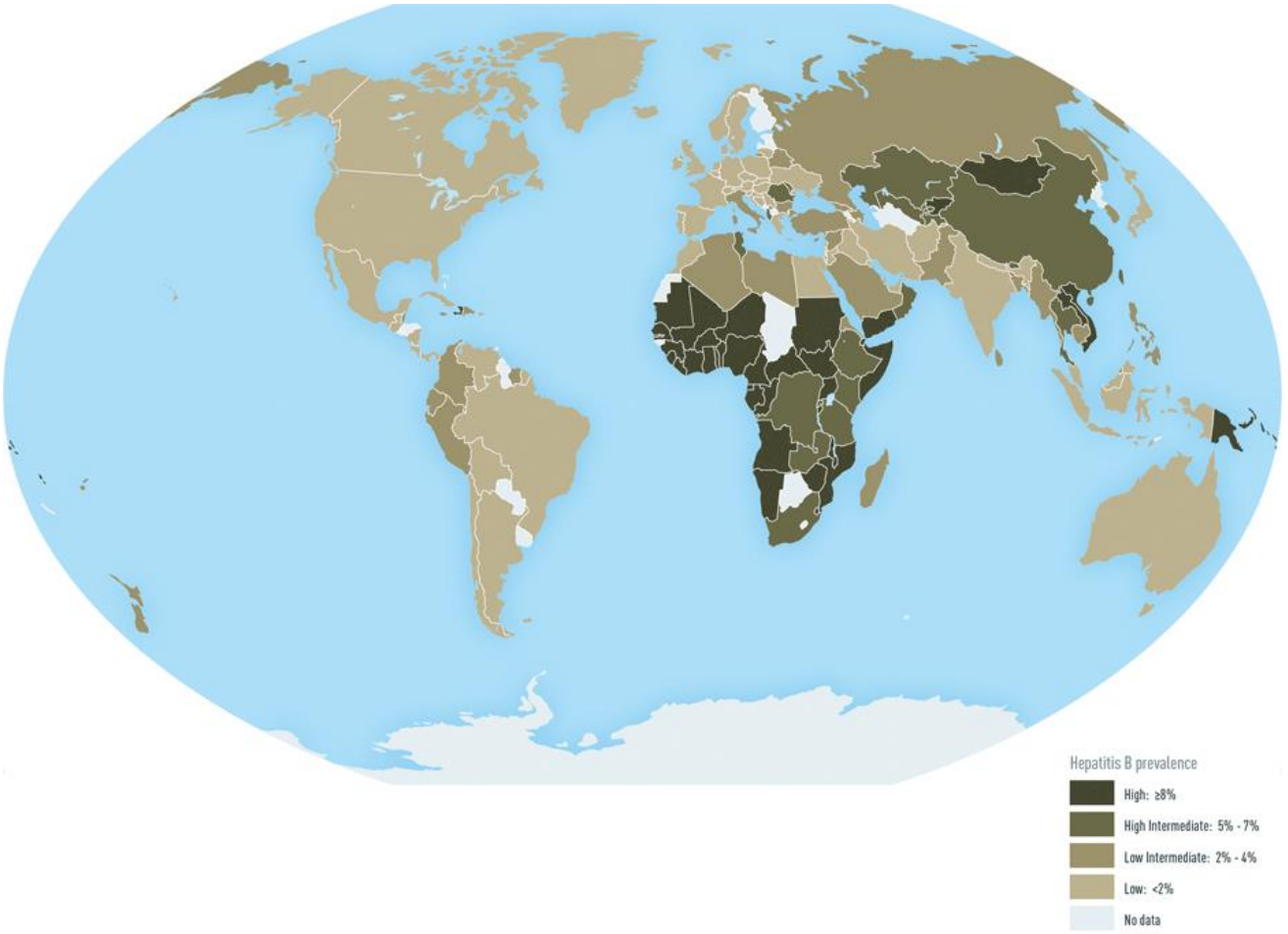
# Hepatitis B

- DNA virus
- small, circular, partially double-stranded DNA virus in the family Hepadnaviridae
- No “cure”



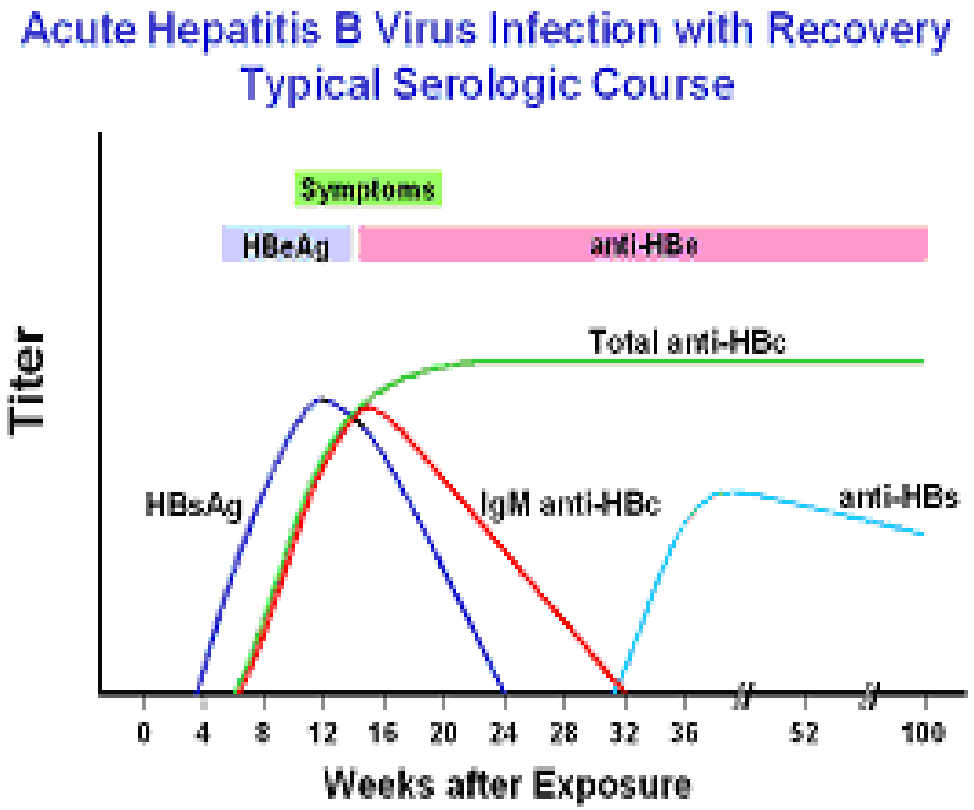
# Hepatitis B


Hepatitis B prevalence
High: ≥8%
High Intermediate: 5% - 7%
Low Intermediate: 2% - 4%
Low: <2%
No data

# Hepatitis B

- Acute infection
- duration - several weeks to several months
- Incubation period – 60-150 days
- Mild symptoms → fulminant hepatitis
- Older (>60 y/o) w/ severe disease

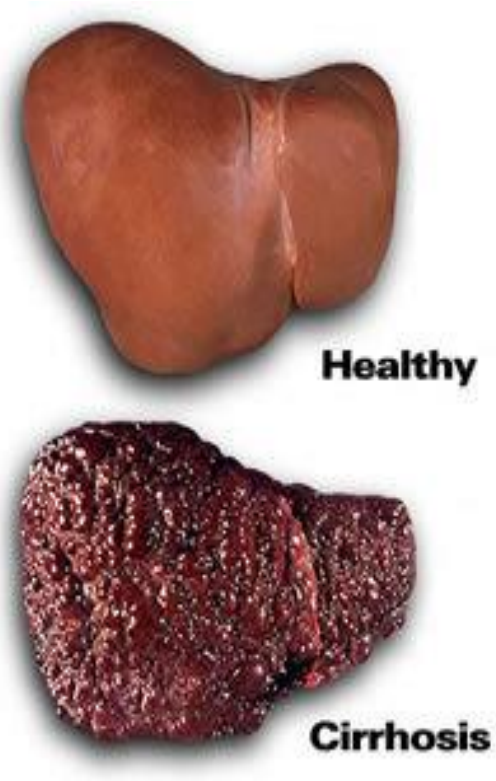
# Hepatitis B

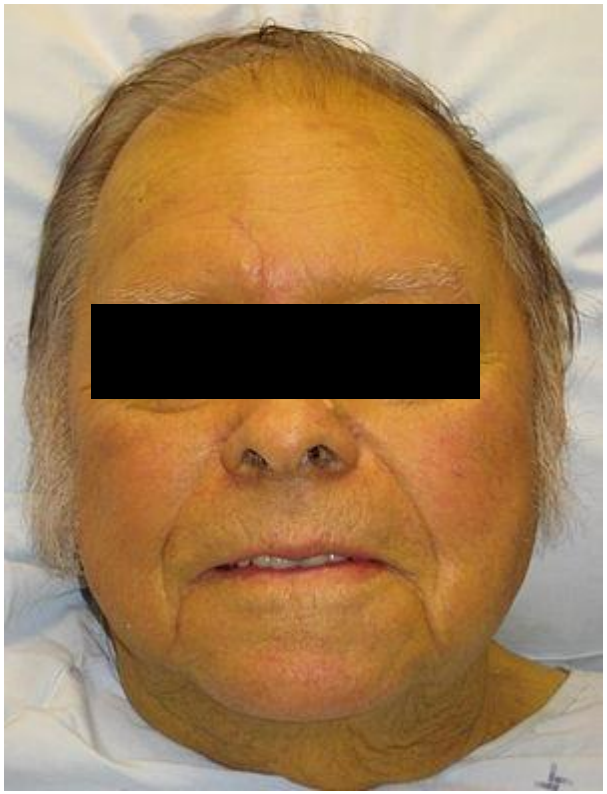

Acute Hepatitis B Virus Infection with Recovery
Typical Serologic Course
Symptoms
HBeAg
anti-HBe
Total anti-HBc
Titer
HBsAg
IgM anti-HBc
anti-HBs
0
4
8
12
16
20
24
28
32
36
52
100
Weeks after Exposure

# Hepatitis B

- Chronic infection
- ~25% chronically infected in childhood ~15% chronically infected after childhood → mortality from cirrhosis or liver cancer
- Most remain asymptomatic until cirrhosis or end-stage liver disease

# Hepatitis B



# Hepatitis B

- **Transmission:**
- percutaneous or mucosal contact with infectious blood or body fluids (e.g., semen, saliva)
- Sex with an infected partner
- Injection drug use that involves sharing needles, syringes, or drug-preparation equipment
- Birth to an infected mother

# Hepatitis B

- **Transmission: (cont.)**
- Contact with blood or open sores of an infected person
- Needle sticks or sharp instrument exposures
- Sharing items such as razors or toothbrushes with an infected person
- HBV is ***not*** spread through food or water, sharing eating utensils, breastfeeding, hugging, kissing, hand holding, coughing, or sneezing.
- durable survival outside body

# Hepatitis B

## Who is at risk for HBV infection?

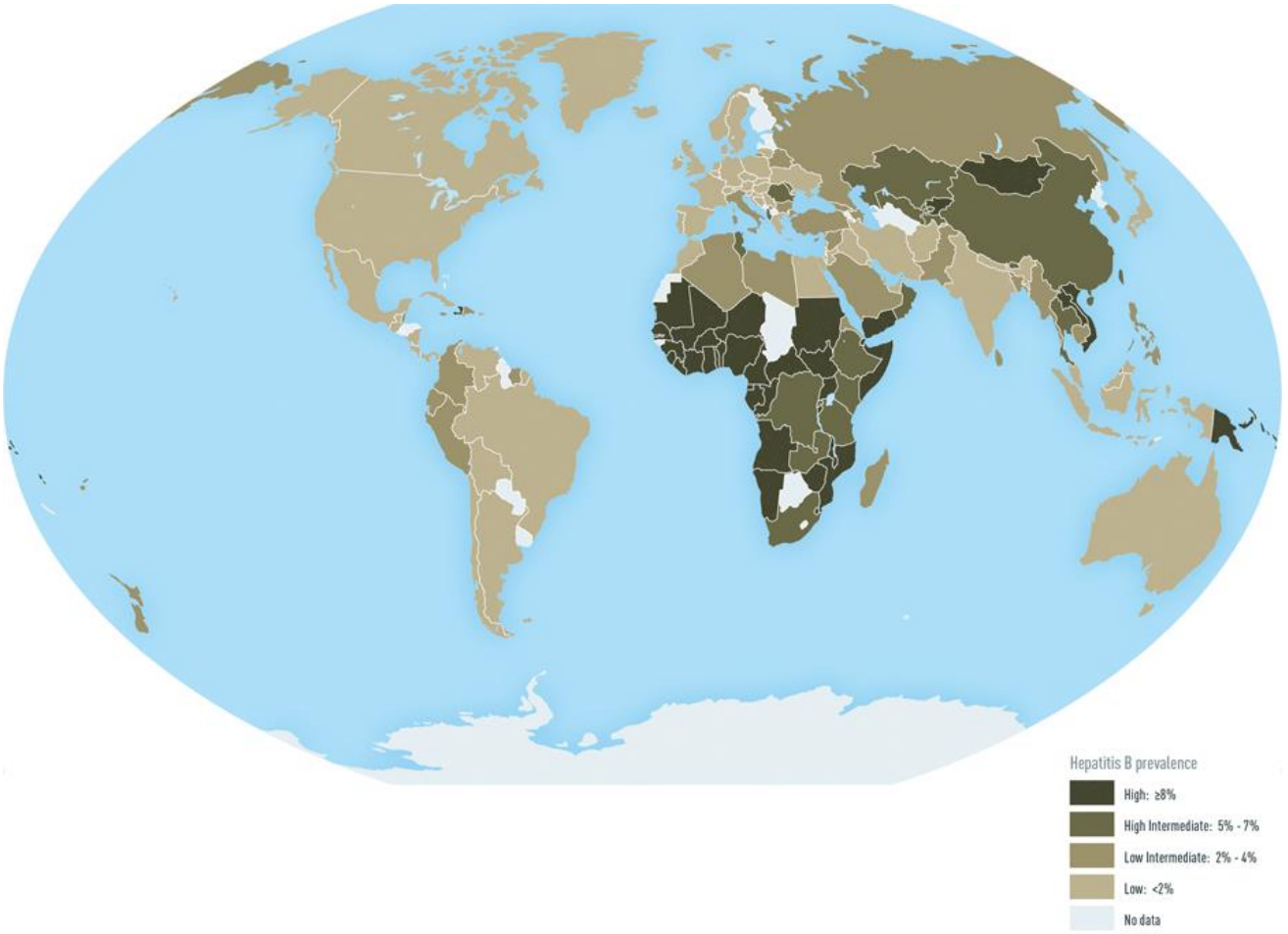
- Infants born to infected mothers
- Sex partners of infected persons
- Men who have sex with men
- Injection drug users
- Household contacts or sexual partners of known persons with chronic HBV infection
- Health care and public safety workers at risk for occupational exposure to blood or blood-contaminated body fluids, and
- Hemodialysis patients

# Hepatitis B

## Screening:

- Screen with HBsAg, antibody to HBsAg [anti-HBs], antibody to hepatitis B core antigen [anti-HBc])
- Persons born in countries with 2% or higher HBV prevalence (remember the map!)
- Men who have sex with men
- Persons who inject drugs
- HIV-positive persons
- Household and sexual contacts of HBV-infected persons
- Persons requiring immunosuppressive therapy
- Persons with end-stage renal disease (including hemodialysis patients)

# Hepatitis B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High: ≥8%
High Intermediate: 5% - 7%
Low Intermediate: 2% - 4%
Low: <2%
No data

# Hepatitis B

## Screening:

- Screen with HBsAg, antibody to HBsAg [anti-HBs], antibody to hepatitis B core antigen [anti-HBc])
- Persons born in countries with 2% or higher HBV prevalence (remember the map!)
- Men who have sex with men
- Persons who inject drugs
- HIV-positive persons
- Household and sexual contacts of HBV-infected persons
- Persons requiring immunosuppressive therapy
- Persons with end-stage renal disease (including hemodialysis patients)

# Hepatitis B

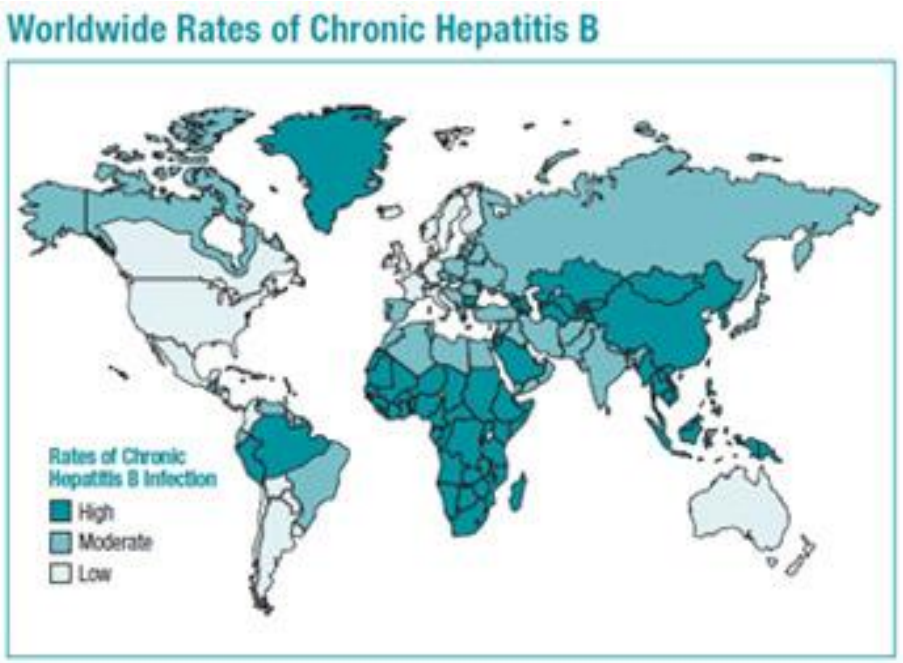
- **Screening: (cont.)**
- Blood and tissue donors
- Persons infected with hepatitis C
- Persons with elevated alanine aminotransferase levels (≥19 IU/L for women and ≥30 IU/L for men)
- Incarcerated persons
- Pregnant women (HBsAg only is recommended)
- Infants born to HBV-infected mothers (HBsAg and anti-HBs are only recommended)

# Hepatitis B

- **Are international travelers at risk for HBV infection?**
- The risk for HBV infection in international travelers is generally low, except for certain travelers to regions where the prevalence of chronic HBV infection is high or intermediate (i.e., hepatitis B surface antigen prevalence of ≥2%). Hepatitis B vaccination should be administered to unvaccinated persons traveling to those countries.

# Hepatitis B

- Health disparities:



# Hepatitis B

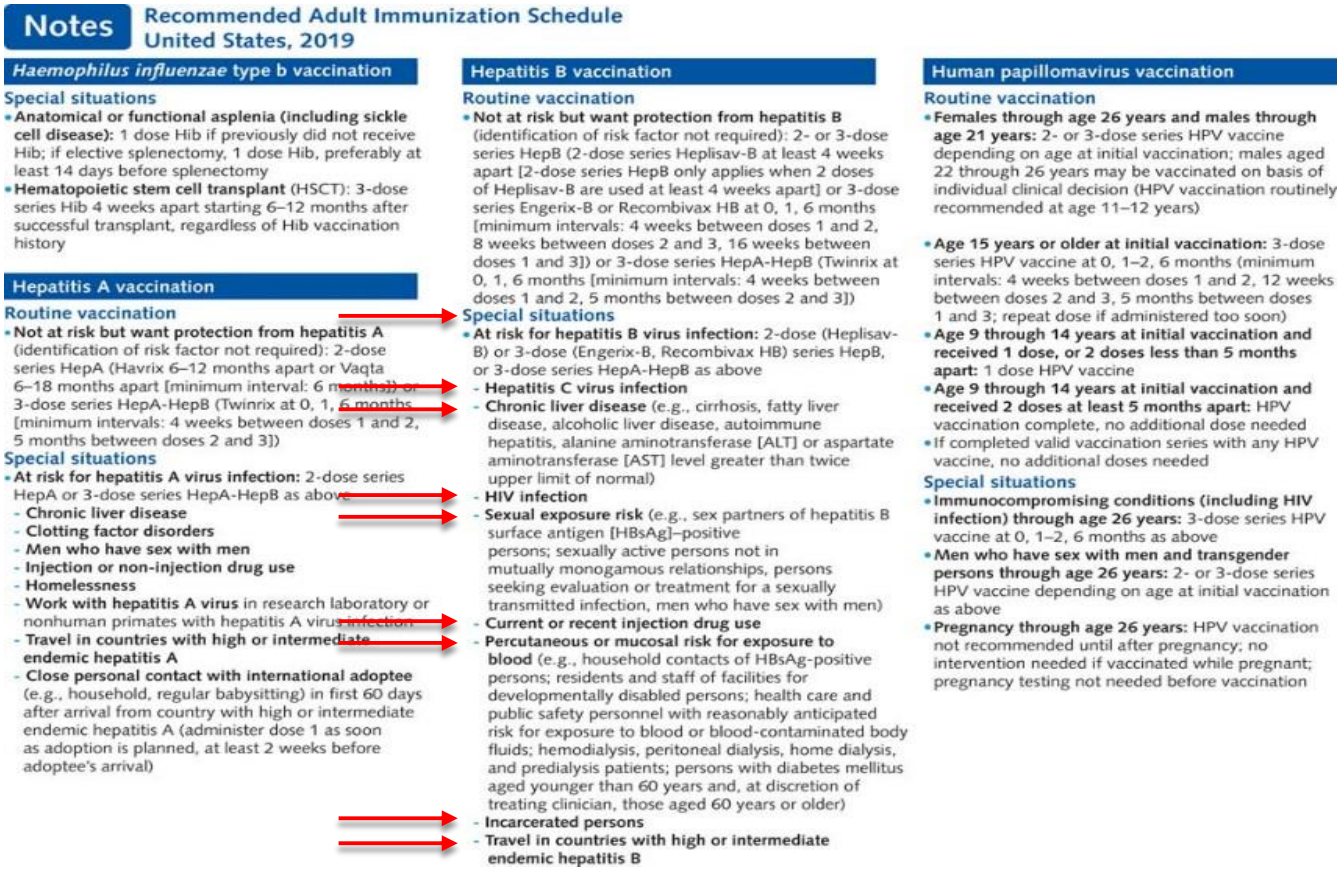
## Health disparities (AAPIs):

- Asian Americans and Pacific Islanders (AAPIs) make up less than 5% of the total population in the United States, but account for more than 50% of nearly one million Americans living with chronic hepatitis B.
- The burden of chronic hepatitis B in the US is greater among people born in regions of the world with high or moderate prevalence of chronic hepatitis B, including much of Asia and the Pacific Islands.
- Nearly 70% of Asian Americans are foreign-born and estimates have found that approximately 58% of foreign-born people with chronic hepatitis B are from Asia
- Left untreated, approximately 15% to 25% of those with chronic hepatitis B infection develop serious liver disease, including cirrhosis, liver damage, and even liver cancer
- Asian Americans and Pacific Islanders are 8-13 times more likely to develop liver cancer than other groups, primarily due to hepatitis B infection
- The liver cancer death rate is 60% higher for Asian Americans and Pacific Islanders than Caucasians

# Hepatitis B

- **Hepatitis B Testing Recommendation for Asian Americans and Pacific Islanders**
- CDC recommend testing the following groups for hepatitis B:
- All people born in regions of the world with high or moderate rates of hepatitis B. This includes all countries in Asia and the Pacific Islands
- All people born in the United States, who were not vaccinated at birth, and who have at least one parent born in a country with high hepatitis B rates. This includes all countries in East and Southeast Asia, except for Japan, and the Pacific Islands
- Household contacts and sexual partners of people with hepatitis B.

# Adult vaccination schedule – "footnotes"



**Notes** Recommended Adult Immunization Schedule United States, 2019

### *Haemophilus influenzae* type b vaccination

**Special situations**

- **Anatomical or functional asplenia (including sickle cell disease):** 1 dose Hib if previously did not receive Hib; if elective splenectomy, 1 dose Hib, preferably at least 14 days before splenectomy
- **Hematopoietic stem cell transplant** (HSCT): 3-dose series Hib 4 weeks apart starting 6–12 months after successful transplant, regardless of Hib vaccination history

### Hepatitis A vaccination

**Routine vaccination**

- **Not at risk but want protection from hepatitis A** (identification of risk factor not required): 2-dose series HepA (Havrix 6–12 months apart or Vaqta 6–18 months apart [minimum interval: 6 months]) or 3-dose series HepA-HepB (Twinrix at 0, 1, 6 months [minimum intervals: 4 weeks between doses 1 and 2, 5 months between doses 2 and 3])

**Special situations**

- **At risk for hepatitis A virus infection:** 2-dose series HepA or 3-dose series HepA-HepB as above
  - **Chronic liver disease**
  - **Clotting factor disorders**
  - **Men who have sex with men**
  - **Injection or non-injection drug use**
  - **Homelessness**
  - **Work with hepatitis A virus** in research laboratory or nonhuman primates with hepatitis A virus infection
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- **At risk for hepatitis B virus infection:** 2-dose (Heplisav-B) or 3-dose (Engerix-B, Recombivax HB) series HepB, or 3-dose series HepA-HepB as above
  - **Hepatitis C virus infection**
  - **Chronic liver disease** (e.g., cirrhosis, fatty liver disease, alcoholic liver disease, autoimmune hepatitis, alanine aminotransferase [ALT] or aspartate aminotransferase [AST] level greater than twice upper limit of normal)
  - **HIV infection**
  - **Sexual exposure risk** (e.g., sex partners of hepatitis B surface antigen [HBsAg]–positive persons; sexually active persons not in mutually monogamous relationships, persons seeking evaluation or treatment for a sexually transmitted infection, men who have sex with men)
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  - **Incarcerated persons**
  - **Travel in countries with high or intermediate endemic hepatitis B**

### Human papillomavirus vaccination

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**Special situations**

- **Immunocompromising conditions (including HIV infection) through age 26 years:** 3-dose series HPV vaccine at 0, 1–2, 6 months as above
- **Men who have sex with men and transgender persons through age 26 years:** 2- or 3-dose series HPV vaccine depending on age at initial vaccination as above
- **Pregnancy through age 26 years:** HPV vaccination not recommended until after pregnancy; no intervention needed if vaccinated while pregnant; pregnancy testing not needed before vaccination



Kim DK, Hunter P; Ann Intern Med. 2019;170:182-92. doi:10.7326/M18-3600

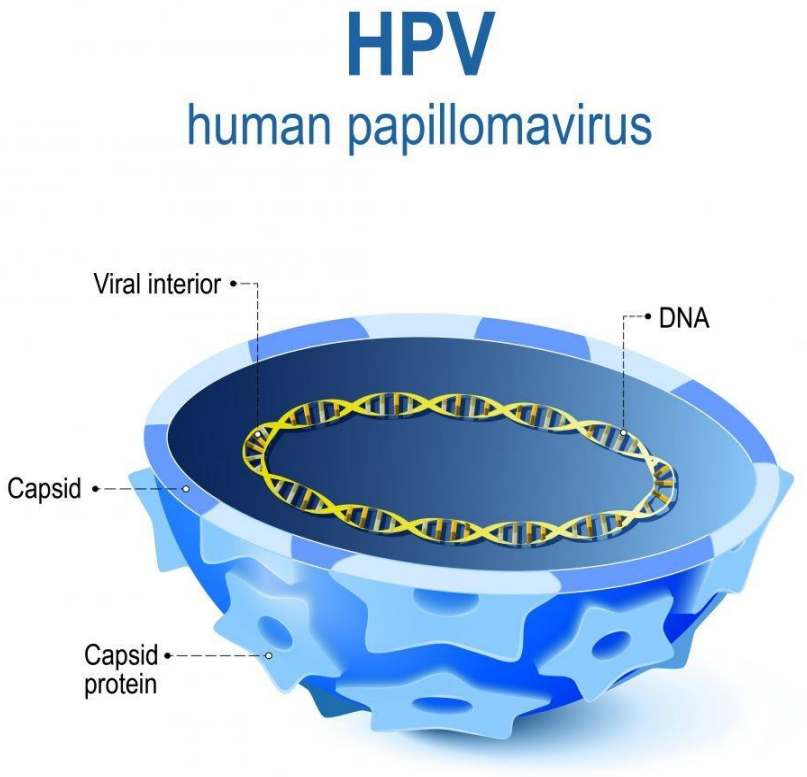
# Hepatitis B

- Vaccine options:
- 2 dose (0, 1 month)
- 3 dose (0, 1 month, 6 month)
- Combination with hepatitis A (0, 1 month, 6 month)

# HPV

# HPV

- Human papilloma virus
- ds DNA viruses
- Papillomavirus genus
- Papillomaviridae family
- infects only humans
- >200 types of HPV

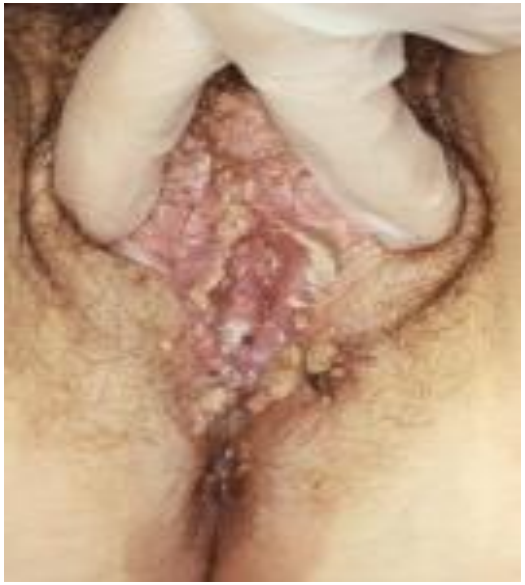


# HPV

- Transmission:
- skin-to-skin contact
- vaginal, anal, or oral sex with infected individual
- Highly prevalent
- Asymptomatic transmission
- Long incubation (symptoms years after infection)
- Typically resolves without treatment
- Persistent infection → genital warts, cancer

# HPV

- Genital warts (condyloma acuminata):
- HPV 6, 11



# HPV

- **HPV-related cancers:**

- Cervix (HPV 16,18; 31, 33, 45, 52, 58)
- vulva, vagina (HPV 16, 18)
- Penis (HPV 16, 18)
- Anus/rectum (HPV 16, 18)
- Oropharyngeal (HPV 16)

# HPV

- Screening:
- Cervical – pap smear/HPV co-test (when indicated)
- Penile – N/A
- Oropharyngeal – N/A
- Anal – “anal pap”?
- no FDA-approved serological or blood tests to detect HPV infection

# HPV

- **“Racial Disparities in Cervical Cancer Screening: Implications for Relieving Cervical Cancer Burden in Asian American Pacific Islander Women.”**
- Cancer Nurs. 2019 Jan 8. doi: 10.1097/NCC.0000000000000642. [Epub ahead of print]
- **RESULTS:**
- AAPI students had significantly lower Pap test knowledge and Pap test receipt rate compared with NLW students.

# HPV

- (J.H. Wang, et. al. Cancer Epidemiol Biomarkers Prev 2008;17(8):1968 – 73)
- “Results: Asian American women had a lower rate of obtaining a recent Pap test (70%) than nonHispanic White women (81%; P = 0.001). More Asians believed in the role of luck and self-care and experienced access barriers than Whites (P < 0.0001). Within the Asian subgroups, Vietnamese women had lower screening rates (55%) and greater Eastern cultural views than their Asian counterparts.”

# HPV

- 7 Oct 2010 Hee Yun Lee, Eunsu Ju, Pa Der Vang, and Melissa Lundquist. Journal of Women's Health.Oct 2010.ahead of print http://doi.org/10.1089/jwh.2009.1783
- **Breast and Cervical Cancer Screening Disparity Among Asian American Women: Does Race/Ethnicity Matter?**

# HPV

- ***"Results:*** Results showed marked differences in cancer screening rates among Asian American subgroups and between cancer types. Cervical cancer screening rates were noticeably higher than breast cancer screening rates in all groups. The Korean group consistently showed the lowest rates of both cancer screenings. Japanese ranked the highest (79.5%) in breast cancer screening but the second lowest (79.7%) in cervical cancer screening. Enabling factors, such as having private health insurance and a usual source of care, were found to be the strongest predictors of receiving both breast and cervical cancer screening. Screenings for both types of cancer increased if a woman was married or was born in the United States."

# HPV

- bidirectional interaction between HIV and HPV infections
- HPV infection is more common among HIV-infected than in -uninfected men and women
- MSM – high burden of anogenital HPV infection, ~60%

# HPV

- HPV vaccines:
- 9-valent vaccine (Gardasil 9) – HPV 6, 11, 16, 18, 31, 33, 45, 52, 58
- (not in U.S.) →
- Quadrivalent HPV vaccine (Gardasil) - HPV 6, 11, 16, 18
- Bivalent vaccine (Cervarix) - HPV 16 and 18.
- Schedule – 0, 2 month, 6 month

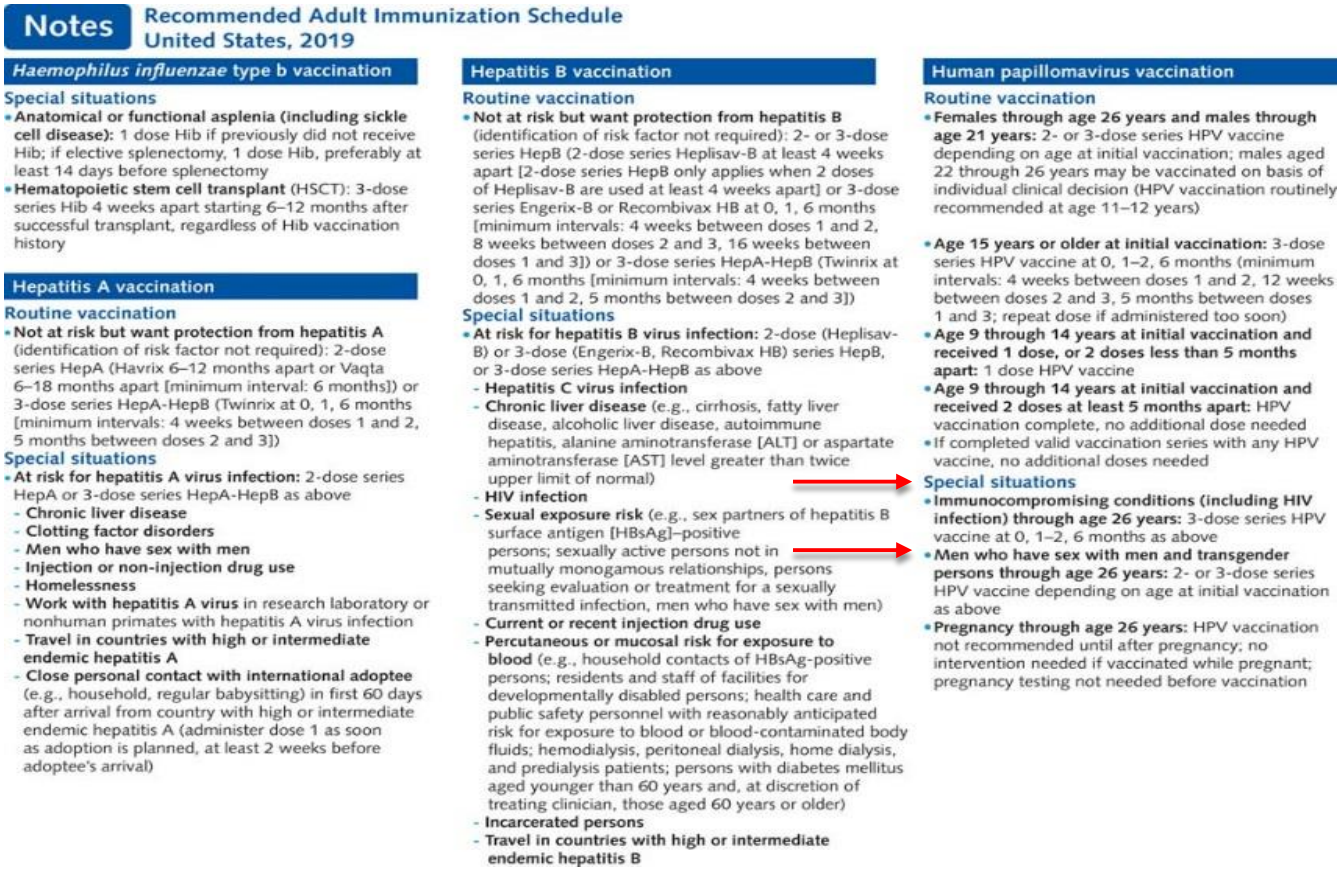
# HPV

- FDA approved “expanded” age range:
- FDA News Release
- **“FDA approves expanded use of Gardasil 9 to include individuals 27 through 45 years old”**
- **For Immediate Release**
- October 5, 2018

# HPV

- NO change in current HPV vaccine rec's (ACIP)
- FDA approval ≠ Insurance coverage

# Adult vaccination schedule – "footnotes"



**Notes** Recommended Adult Immunization Schedule United States, 2019

### *Haemophilus influenzae* type b vaccination

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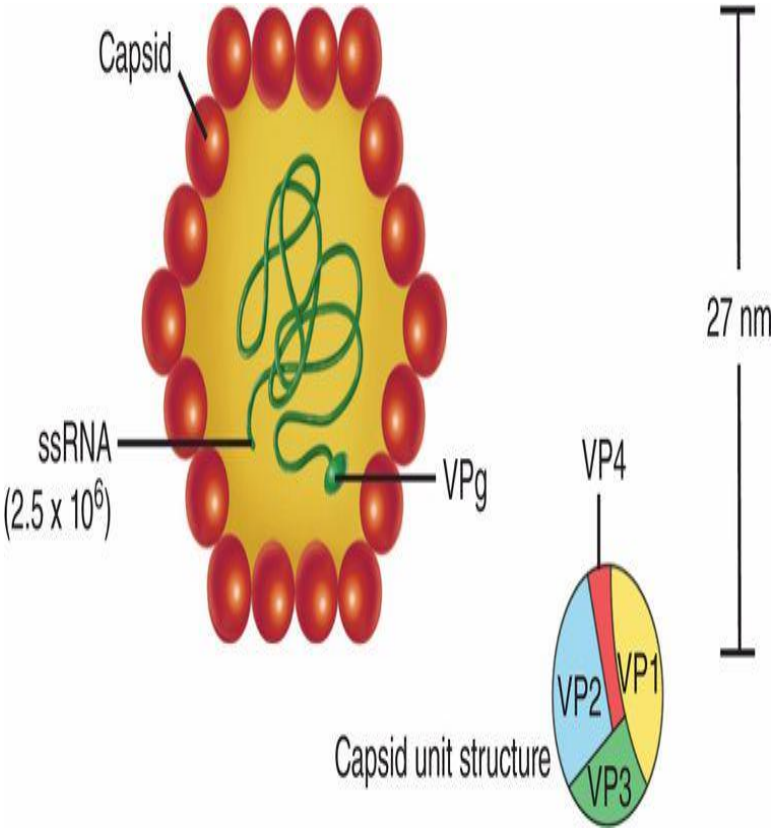
# Hepatitis A

- ssRNA
- No chronic infection
- Fulminant infection rare
- genus *Hepatovirus*
- family Picornaviridae



# Hepatitis A

- Transmission:
- fecal-oral route (either via person-to-person contact or consumption of contaminated food or water).

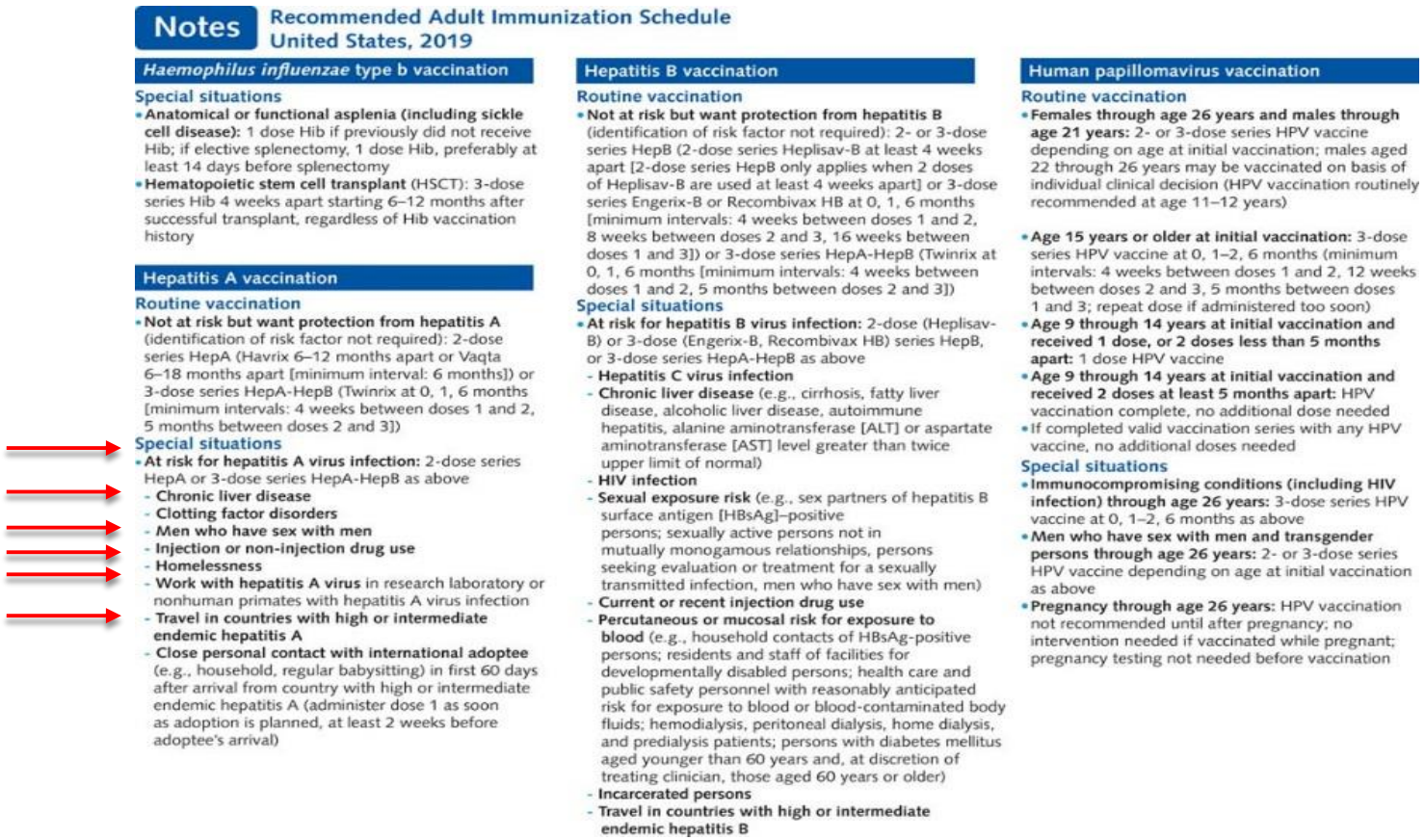


https://www.mass.gov/info-details/current-hepatitis-a-outbreak#alerts-and-advisories-

# Hepatitis A

- **Current Hepatitis A Outbreak**
- "The Massachusetts Department of Public Health and local boards of health are tracking an outbreak of acute hepatitis A virus (HAV) infection in the Commonwealth. These cases are all individuals who have recent experience of homelessness, unstable housing, and/or substance use disorder. Public health interventions include increased healthcare awareness efforts, public notification and education, and support of vaccination clinics for high-risk populations"

# Adult vaccination schedule – "footnotes"



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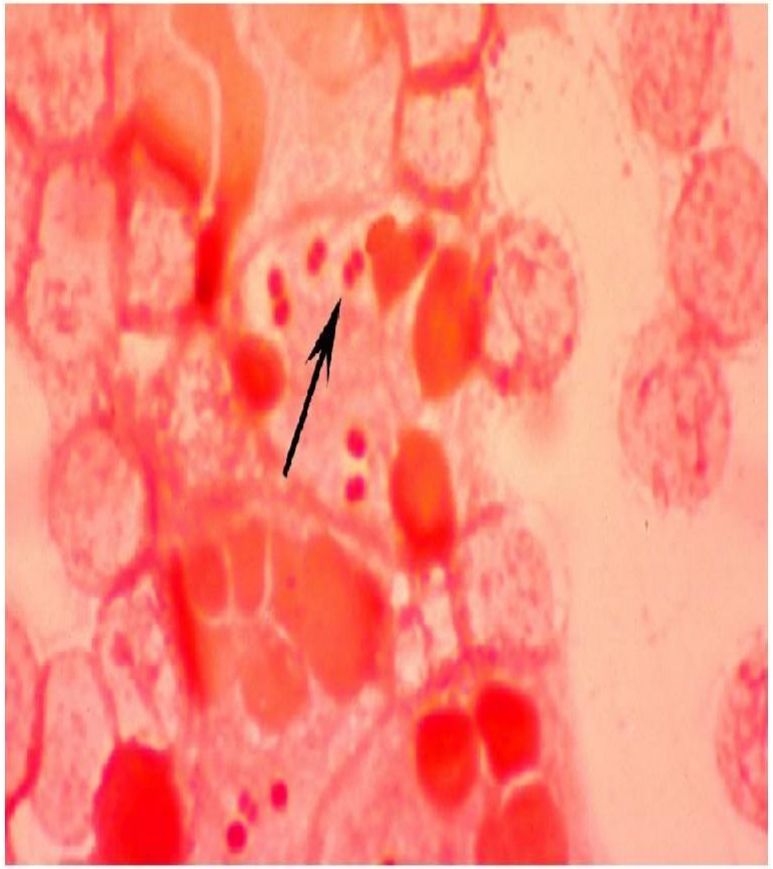
# Hepatitis A

- HAV vaccine:
- 0, 6 month

- Combination w/ HBV vaccine:
- 0, 1 month, 6 month

# Meningococcal

- Neisseria meningitidis
- Gram negative diplococci



# Meningococcal

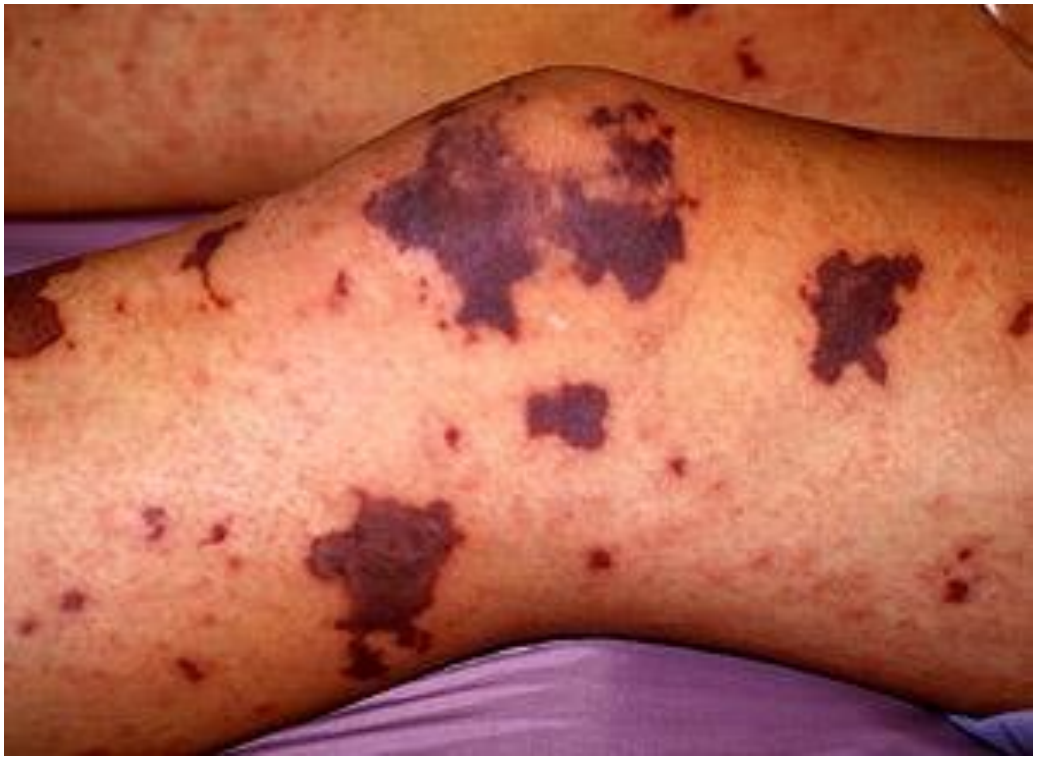
- fever, headache, and stiff neck
- similar to influenza (flu),
- nausea, vomiting,
- increased sensitivity to light
- Invasive meningococcal disease (IMD)

# Meningococcal

- Transmission:
- close contact/quarters
- Respiratory & oropharyngeal droplets

# Meningococcal

"Rash"



# Meningococcal

- Conjugate vaccine – A, C, W, Y (Mentactra® and Menveo®)

- Serogroup B vaccine - (Bexsero® and Trumenba®)

# Meningococcal

- Meningococcal Conjugate Vaccine
- component deficiency (e.g., C5-C9, properdin, factor H, factor D, or are taking eculizumab [Soliris®])
- functional or anatomic asplenia
- living with HIV
- microbiologist who is routinely exposed to *Neisseria meningitidis*
- traveling or residing in countries in which the disease is common
- part of a population identified to be at increased risk because of a serogroup A, C, W or Y meningococcal disease outbreak
- first-year college student living in a residence hall
- military recruit
- **HOUSING INSECURITY – MA DPH advisory January 2019**

# Meningococcal

- https://www.mass.gov/lists/massachusetts-department-of-public-health-immunization-program-advisories-and-alerts

- "Update: Invasive Meningococcal Disease among People Experiencing Homelessness" – January 22, 2019

# Meningococcal

- "In January 2018, the Massachusetts Department of Public Health (MDPH) reported that two people experiencing homelessness in Greater Boston had been diagnosed with invasive meningococcal disease (IMD) serogroup C. Since that time, there have been three additional cases of IMD serogroup C among people in this population, and one additional case in a person with close connections to the homeless community. The most recent onset was December 2018. Cases have ranged in age from 33-59 and five of the six have been male. None of the cases appear to have received quadrivalent meningococcal vaccine (MenACWY) prior to becoming ill. The results of genetic sequencing demonstrate that all six isolates have similar molecular profiles."

# Meningococcal

- “Prompt recognition and antibiotic treatment of meningococcal disease is critical. Symptoms of meningococcal bacteremia may include fever, fatigue, nausea, vomiting, cold hands and feet, chills, severe muscle aches or abdominal pain, rapid breathing, diarrhea, and a petechial or purpuric rash. Meningococcal meningitis may present with sudden onset of fever, headache, and stiff neck, accompanied by nausea, vomiting, photophobia, and altered mental status. An atypical subacute presentation with mild, non-specific symptoms may also occur. Clinicians should maintain a high index of suspicion for IMD, particularly in individuals experiencing homelessness or with links to that population.”

# Meningococcal

- Serogroup B Meningococcal Vaccine
- complement component deficiency (e.g., C5-C9, properdin, factor H, factor D, or are taking eculizumab [Soliris®])
- functional or anatomic asplenia
- microbiologist who is routinely exposed to *Neisseria meningitidis*
- population identified to be at increased risk because of a serogroup B meningococcal disease outbreak

# Action steps

- Target health disparities:
- – AAPIs – liver cancer, cervical cancer
- - HIV infected, housing insecurity, MSM

- Special situations:
- - chronic liver disease
- - diabetes
- - Immunocompromised
- - travelers

# Action steps

- EHR tools – vaccinations by age (current)
- EHR tools - vaccinations by medical condition (evolving)
- Physicians (particularly PCPs) – vaccine "champions"
- MAIC – cross collaborations
- Don't forget the "footnotes"! (Adult Immunization Schedules)

# Questions/Contacts

- American College of Physicians (ACP) - Massachusetts Chapter
- Twitter (@ACPMAChapter)
- Facebook (@MassachusettsACP)

- ACP Governor - Massachusetts ACP Chapter
- Instagram (@maacpgovernor)
- Twitter (@MAACPGovernor)
- Facebook (@MAACPGovernor)