Massachusetts Department of Public Health

Updates in Adult Immunizations

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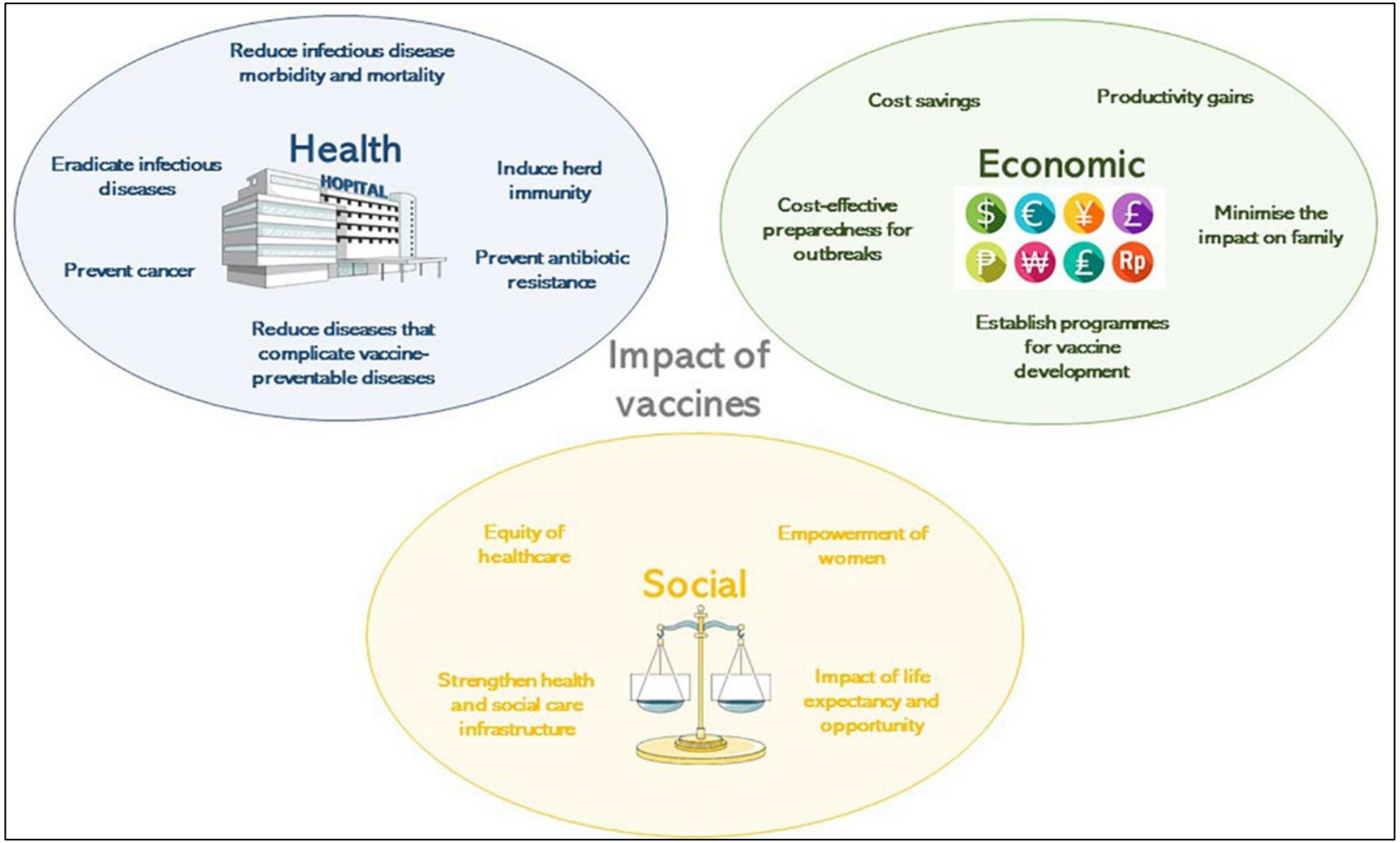
Immunization is Important for Public Health

Thank you for being a part of the community of vaccinators!

"The impact of vaccination on the health of the world's peoples is hard to exaggerate. With the exception of safe water, no other modality has had such a major effect on mortality reduction and population growth"

Plotkin, S. A., and Mortimer, E. A. (1988). *Vaccines.* Philadelphia, PA: Saunders.



Rodrigues Charlene M. C., Plotkin Stanley A., Impact of Vaccines; Health, Economic and Social Perspectives,Frontiers in Microbiology,11,2020 DOI=10.3389/fmicb.2020.01526

Updates in Adult Immunizations Outline

- COVID-19
- RSV
- Hepatitis B
- Mpox
- Pneumococcal vaccines

COVID-19 Pandemic

- December 12, 2019 - A cluster of patients in China's Hubei Province, in the city of Wuhan, begin to experience the symptoms of an atypical pneumonia-like illness that does not respond well to standard treatments.
- January 31, 2020 – Federal government declares the 2019 Novel Coronavirus (2019-nCoV) outbreak a public health emergency.
- First COVID-19 vaccines became available in December 2020
- Exacted a large toll on society in many ways
- The economic toll of the COVID-19 pandemic in the US will reach $14 trillion by the end of 2023*
- As of June 3, 2023, there have been 6,176,446 COVID-19 hospitalizations and 1,131,439 people have died of COVID-19
- May 11, 2023 - the COVID-19 Federal Public Health Emergency (PHE) ended. Public health response is shifting from shifting from an emergency response to incorporating COVID-19 activities into sustainable public health practice.

*Terrie Walmsley, Adam Rose, Richard John, Dan Wei, Jakub P. Hlávka, Juan Machado, Katie Byrd, Macroeconomic consequences of the COVID-19 pandemic, *Economic Modelling*,120, 2023, doi.org/10.1016/j.econmod.2022.106147.

COVID-19

- Coronavirus disease (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 - (SARS-CoV-2).
- SARS-CoV-2 is transmitted by exposure to infectious respiratory fluids.
- Clinical presentation of COVID-19 - from asymptomatic to critical illness. An infected person can transmit of SARS-CoV-2 before the onset of symptoms. Symptoms can change over the course of illness and can progress in severity.
- Risk of severe COVID-19 increases with increasing age over 40 years and with increasing number of certain underlying medical conditions.

COVID-19 Vaccines

- First COVID-19 vaccines became available in December 2020.
- Vaccines were a critical component in the fight against COVID-19.
- Over time, there have been several changes in the recommended dosing of the vaccines.
- The initial vaccines were monovalent (targeted to the original variant) and dosed in a two dose primary series, with a booster.
- Moving away from the terms “primary series” and “booster.”

COVID-19 Vaccine Update

April 18, 2023 – the FDA amended the EUA for mRNA COVID vaccines - The monovalent Moderna and Pfizer-BioNTech COVID-19 vaccines are no longer authorized for use in the US.

Both of the Moderna and Pfizer-BioNTech mRNA COVID-19 vaccines currently available in the US are formulated as a bivalent vaccine based on the original (ancestral) strain of SARS-CoV-2 and the Omicron BA.4 and BA.5 (BA.4/BA.5) variants of SARS-CoV-2.

Modification of the schedule to enhance simplicity

COVID-19 Available Vaccines in the US

mRNA vaccines

- Moderna COVID-19 Vaccine, Bivalent
- Pfizer-BioNTech COVID-19 Vaccine, Bivalent

Protein subunit vaccine

- Novavax COVID-19 Vaccine, Adjuvanted - remains authorized for use as a 2-dose primary series and as a booster dose in certain limited situations.

Janssen (J&J) COVID-19 Vaccine is no longer available in the United States.

COVID-19 Vaccination Recommendations

CDC recommends that people ages 6 months and older receive at least 1 bivalent mRNA COVID-19 vaccine

Unvaccinated or previously received only monovalent vaccine doses are recommended to receive 1 bivalent mRNA vaccine dose

People ages 12 years an older who previously received 1 or 2 monovalent Novavax primary series dose(s) are recommended to receive 1 bivalent mRNA vaccine dose.

Recommended COVID-19 vaccines for **people without immunocompromise, aged 12 years and older,** mRNA vaccines, *with vial icons and dosages,* May 2023*†

COVID-19 vaccination status May 2023

Unvaccinated

Vaccinated

Previously received vaccine(s)

1 or more doses monovalent Moderna

1 or more doses monovalent Pfizer-BioNTech

2 doses monovalent Moderna and **1 dose bivalent** mRNA

2 doses monovalent Pfizer-BioNTech and **1 dose bivalent** mRNA

Number of doses indicated, by manufacturer

1 dose
Moderna Bivalent
0.5 mL/50 ug

OR

1 dose
Pfizer-BioNTech Bivalent
0.3 mL/30 ug

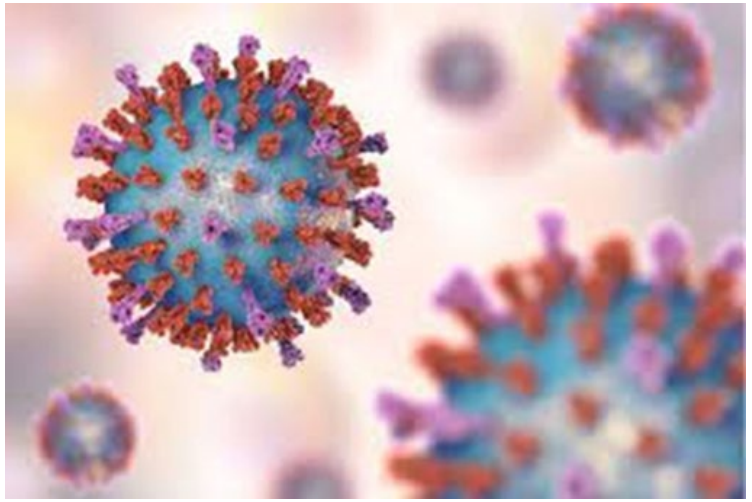
VACCINATION COMPLETE†

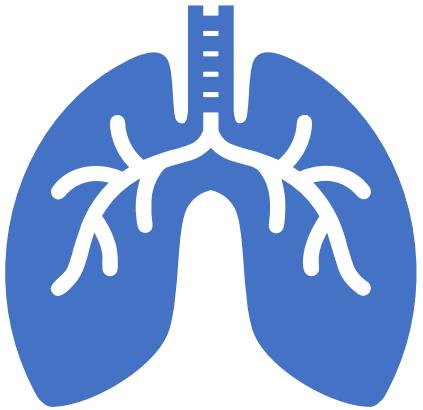
COVID-19 Vaccine Optional Doses

People ages 65 years	option to receive 1 additional bivalent mRNA vaccine dose if it has been at least 4 months after their first bivalent mRNA vaccine dose.
People ages 12 years and older who are moderately or severely immunocompromised	option to receive 1 additional dose of bivalent mRNA vaccine dose at least 2 months following the last recommended bivalent COVID-19 vaccine dose. Further additional dose(s) may be administered at least 2 months after the last COVID-19 vaccine dose.

Respiratory syncytial virus (RSV)

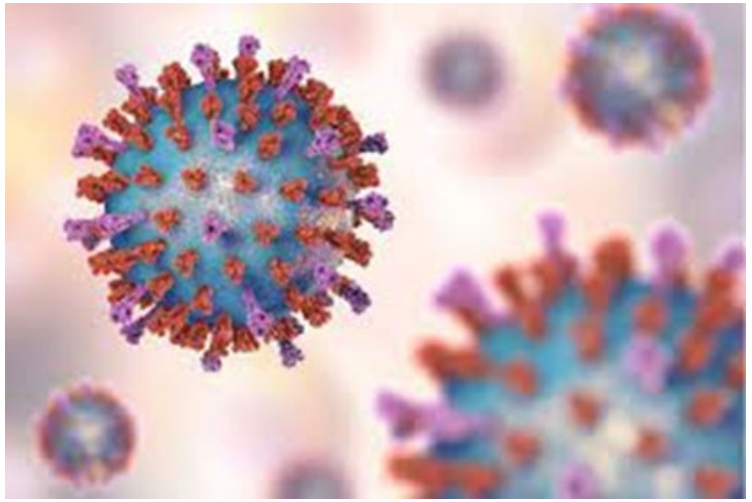
- Causes annual outbreaks of respiratory illnesses in all age groups
- RSV season starts in the fall and peaks in the winter
- RSV often causes mild disease, but can cause severe disease – lower respiratory tract disease and hospitalization - particularly in very young infants (and in older adults
- Between 60,000 and 160,000 older adults are hospitalized and between 6,000 and 10,000 die due to RSV infection

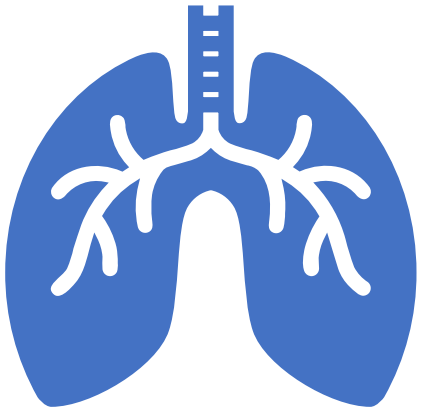




Respiratory syncytial virus (RSV)

- RSV belongs to genus Orthopneumovirus
- Typically infected with RSV for the first time as an infant or toddler and nearly all children are infected before their second birthday. However, repeat infections may occur throughout life, - people of any age can be infected.
- Those at high risk for severe illness from RSV include:
  - Older adults, especially those 65 years and older
  - Adults with chronic lung or heart disease
  - Adults with weakened immune systems
- RSV can sometimes also lead to exacerbation of serious conditions such as:
  - Asthma
  - Chronic obstructive pulmonary disease (COPD)
  - Congestive heart failure



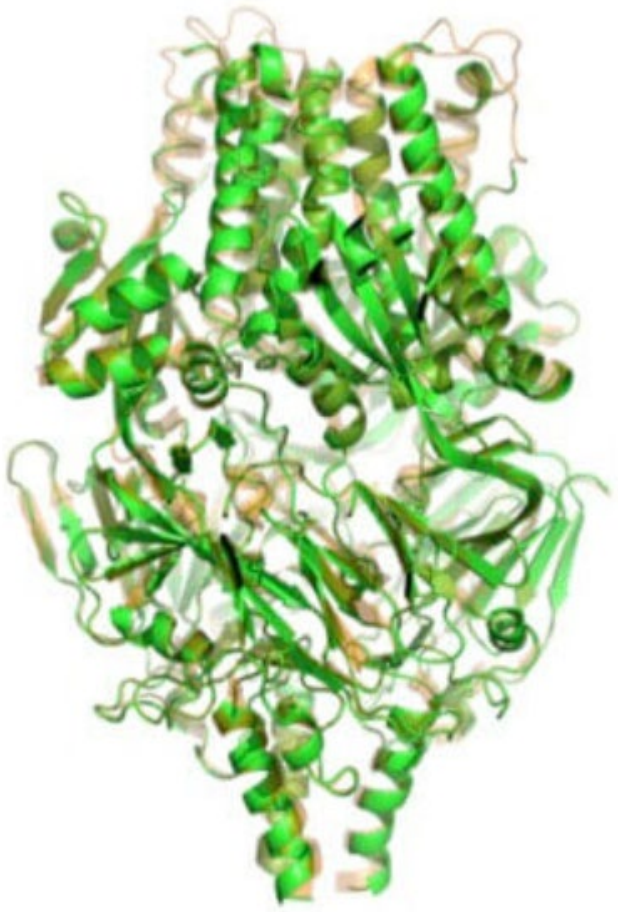


Respiratory syncytial virus (RSV) Vaccine

- A vaccine to help prevent RSV had been an elusive public health quest for more than half a century
- A formalin-inactivated virus, FI-RSV, the earliest vaccine for RSV, was tested in the 1960s in clinical trials, but it resulted in vaccine-enhanced disease (VED)
- Virus uses a special protein called a fusion (F) glycoprotein to pass through the cell membrane.
- When the F protein is in the prefusion form, it is unstable — it has a strong tendency to snap into the postfusion form. That prefusion F instability made it hard for researchers to lock F into the prefusion form.

Respiratory syncytial virus (RSV) Vaccine

- In 2013, the NIH made a breakthrough discovery by figuring out the detailed crystal structure of prefusion RSV F.
- Also showed that the RSV-neutralizing antibodies in humans are directed toward this prefusion form.
- The identification of the prefusion crystal structure made it possible for researchers to develop methods to modify the sequence of F to prevent it from switching to the postfusion form →development of vaccines that produces antibodies that can neutralize the prefusion F protein.



McLellan JS, Chen M, Leung S, Graepel KW, Du X, Yang Y, Zhou T, Baxa U, Yasuda E, Beaumont T, Kumar A, Modjarrad K, Zheng Z, Zhao M, Xia N, Kwong PD, Graham BS. Structure of RSV fusion glycoprotein trimer bound to a prefusion-specific neutralizing antibody. Science. 2013 May 31;340(6136):1113-7. doi: 10.1126/science.1234914.

Respiratory syncytial virus (RSV) Vaccine

- Two new RSV vaccines were recently approved by the FDA: GSK's Arexvy on May 3, and Pfizer's Abrysvo on May 18/May 31.
- Both vaccines have F protein stabilized in its prefusion conformation to trigger antibodies produced against the F protein to interfere with the virus' ability to fuse and infect cells.
- Both approvals are for adults ages 60 and above, who are among the most vulnerable to the infection

Arrexvy – Older Adults

- Single dose given to people ages 60 and older - vaccine reduced the risk of getting RSV-associated lower respiratory tract disease by 82.6% and the risk of having a severe disease by 94.1%.

Concerns:

- Atrial fibrillation (an abnormal heart rhythm) was reported in 10 people who got the vaccine and four who received the placebo.
- In a group receiving the RSV vaccine with an influenza vaccine, two people had acute disseminated encephalomyelitis. One died.
- In another study, one person developed Guillain-Barre syndrome.

The FDA is requiring GSK to do a post-marketing study to investigate further the risks for Guillain-Barre syndrome and ADEM. GSK will also assess atrial fibrillation risks in a post-marketing study, voluntarily.

Abresyvo – Older Adults

- Single dose given to people ages 60 and older - Reduced the risk of RSV-related lower respiratory tract disease with two or more symptoms by 66.7% and three or more symptoms by 85.7%.

Concerns:

  - Guillain-Barre syndrome; two people got GBS.
  - Atrial fibrillation was reported by 10 people who got the vaccine and four who got a placebo.

- The FDA is requiring Pfizer to do a post-marketing study on the risks of Guillain-Barre; the company will assess voluntarily the atrial fibrillation.

Abrysvo – Maternal vaccine

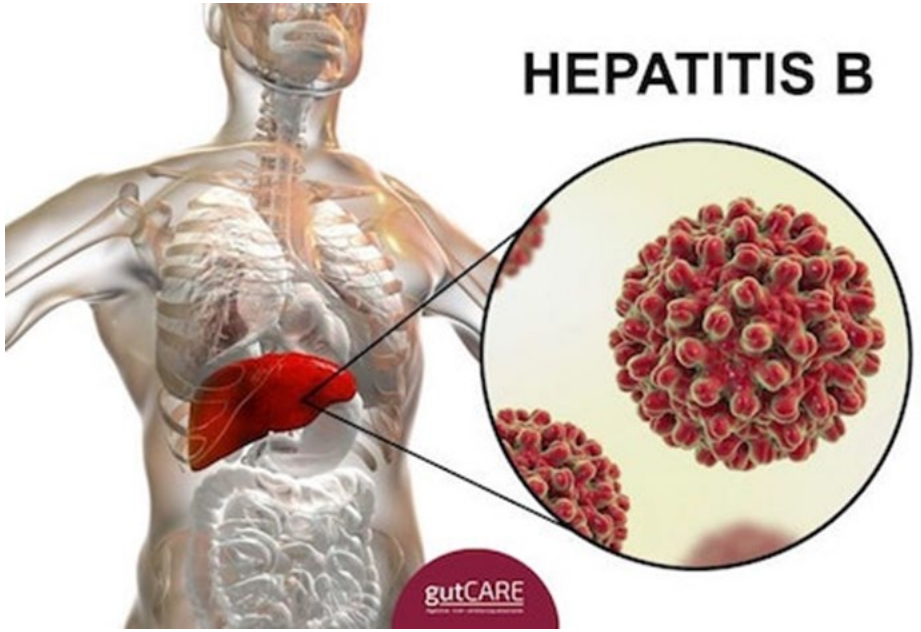
Tested in about 7,300 women after the 24th week of pregnancy -

- First 90 days after birth - six infants in the vaccination group contracted a severe case of RSV compared with 33 in the placebo group – vaccine efficacy of almost 82%
- Six months after birth - 19 babies who became seriously ill in the treatment group compared with 62 in the placebo group - vaccine efficacy of 69%
- FDA approved May 18

Concerns: 6.8 percent receiving the treatment had preterm births, compared to 5 percent in the placebo group – not statistically significant

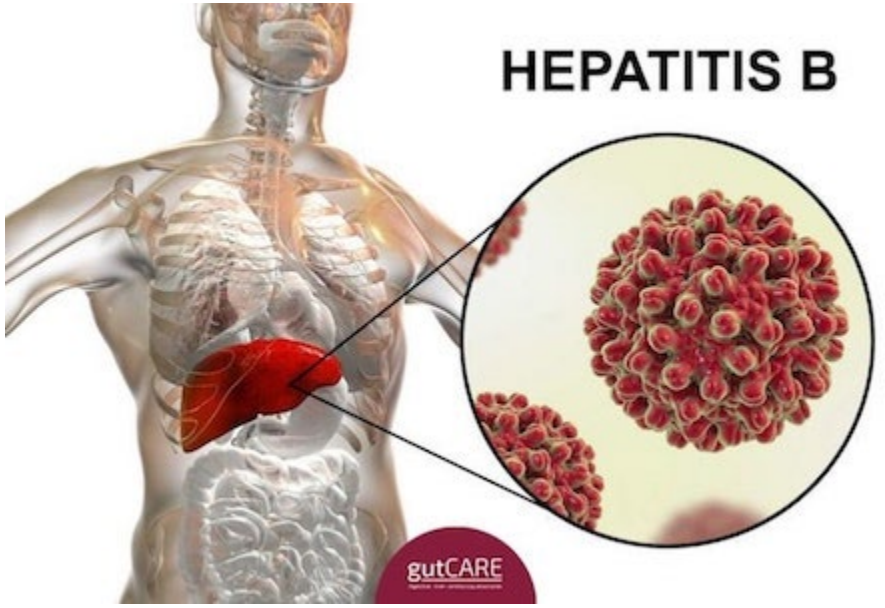
Hepatitis B

- Hepatitis B is a communicable disease of the liver caused by HBV.
- Hepatitis B is the most common serious liver infection in the world.
- Hepatitis B virus that attacks and injures the liver. Worldwide two billion people (or 1 in 3) have been infected and about 300 million people are living with a chronic hepatitis B infection. Each year up to 1 million people die from hepatitis B world wide.
- In the DHHS estimates that there are US 2.2 million living with hepatitis B – 70% may be unaware of infection



Hepatitis B

- Transmitted through direct contact with infected blood.
- Can happen through direct blood-to-blood contact, unprotected sex, unsterile needles, and unsterile medical or dental equipment.
- Globally, hepatitis B is most commonly spread from an infected mother to her baby due to the blood exchange during childbirth.
- In US, IV drug use is the most common risk factor



Hepatitis B Vaccine

- Effective vaccine against hepatitis B available for many years
- Infants and children have routinely been vaccinated against hepatitis B
- Previously, the approach to vaccinating adults (≥ 19 years) was risk based.
  - Can be difficult to assess risk
  - People with elevated risk of hepatitis B were vaccinated at sub optimal rates

Number of cases of hepatitis B have been increasing among adults aged ≥40 years

April, 2022 - ACIP recommended expanding the indicated age range for hepatitis B vaccination to now include adults aged 19–59 years.

Removes the risk factor assessment previously recommended to determine vaccine eligibility in this adult age group

Persons recommended to receive hepatitis B vaccination

All infants

Persons aged <19 years

Adults aged 19–59 years

Adults aged ≥60 years with risk factors for hepatitis B:

Persons at risk for infection by sexual exposure

- Sex partners of persons testing positive for HBsAg
- Sexually active persons who are not in a long-term, mutually monogamous relationship (e.g., persons with more than one sex partner during the previous 6 months)
- Persons seeking evaluation or treatment for a sexually transmitted infection
- Men who have sex with men

Persons at risk for infection by percutaneous or mucosal exposure to blood

- Persons with current or recent injection drug use
- Household contacts of persons testing positive for HBsAg
- Residents and staff members of facilities for persons with developmental disabilities
- Health care and public safety personnel with reasonably anticipated risk for exposure to blood or blood-contaminated body fluids
- Persons on maintenance dialysis, including in-center or home hemodialysis and peritoneal dialysis, and persons who are predialysis
- Persons with diabetes at the discretion of the treating clinician

Persons recommended to receive hepatitis B vaccination

Adults aged ≥60 years with risk factors for hepatitis B:

- International travelers to countries with high or intermediate levels of endemic hepatitis B virus infection (HBsAg prevalence of ≥2%)
- Persons with hepatitis C virus infection
- Persons with chronic liver disease (including, but not limited to, persons with cirrhosis, fatty liver disease, alcoholic liver disease, autoimmune hepatitis, and an alanine aminotransferase or aspartate aminotransferase level greater than twice the upper limit of normal)
- Persons with HIV infection
- Persons who are incarcerated

Adults aged ≥60 years without known risk factors for hepatitis B may receive hepatitis B vaccines

Hepatitis B Vaccine

HepB vaccine*/Age group, yrs	Dose (μg)	Volume (mL)	Schedule
Recombivax HB			
11–15	10	1	2 doses at 0 and 4–6 mos†
11–19	5	0.5	3 doses at 0, 1, and 6 mos†
≥20	10	1	
Adults on hemodialysis and other immunocompromised adults aged ≥20	40	1	
Engerix-B			
11–19	10	0.5	3 doses at 0, 1, and 6 mos
≥20	20	1	
Adults on hemodialysis and other immunocompromised adults aged ≥20	40	2	4 doses at 0, 1, 2, and 6 mos§
Heplisav-B			
≥18¶	20	0.5	2 doses at 0 and 1 mos
Twinrix (HepA-HepB combination vaccine)			
≥18	20	1	3 doses at 0, 1, and 6 mos (standard) or 4 doses at 0 d, 7 d, 21–30 d, and 12 mos (accelerated)
PreHevbrio (ACIP-recommended in 2022)			
≥18¶	10	1	3 doses at 0, 1, and 6 mos

Hepatitis B Vaccine

- If the HepB vaccination schedule is interrupted, the series does not need to be restarted - the next dose should be administered as soon as possible.

- Safety and effectiveness of Heplisav-B and PreHevbrio have not been established in adults on hemodialysis. (use Engerix-B or Recombivax)

- Data on Heplisav-B and PreHevbrio are currently insufficient to inform vaccine-associated risks in pregnancy. Thus, providers should vaccinate pregnant persons needing HepB vaccination with Engerix-B, Recombivax HB, or Twinrix.

Hepatitis B Vaccine

If the HepB vaccination schedule is interrupted, the series does not need to be restarted - the next dose should be administered as soon as possible.

Safety and effectiveness of Heplisav-B and PreHevbrio have not been established in adults on hemodialysis.

Data are not available to assess the effects of Heplisav-B and PreHevbrio on breastfed infants or on maternal milk production and excretion.

Data on Heplisav-B and PreHevbrio are currently insufficient to inform vaccine-associated risks in pregnancy. Thus, providers should vaccinate pregnant persons needing HepB vaccination with Engerix-B, Recombivax HB, or Twinrix.

Hepatitis B virus screening and testing recommendations — CDC, 2023

Universal hepatitis B virus (HBV) screening

HBV screening at least once during a lifetime for adults aged ≥18 years (new recommendation)

During screening, test for hepatitis B surface antigen (HBsAg), antibody to HBsAg, and total antibody to HBcAg (total anti-HBc) (new recommendation)

Screening pregnant persons

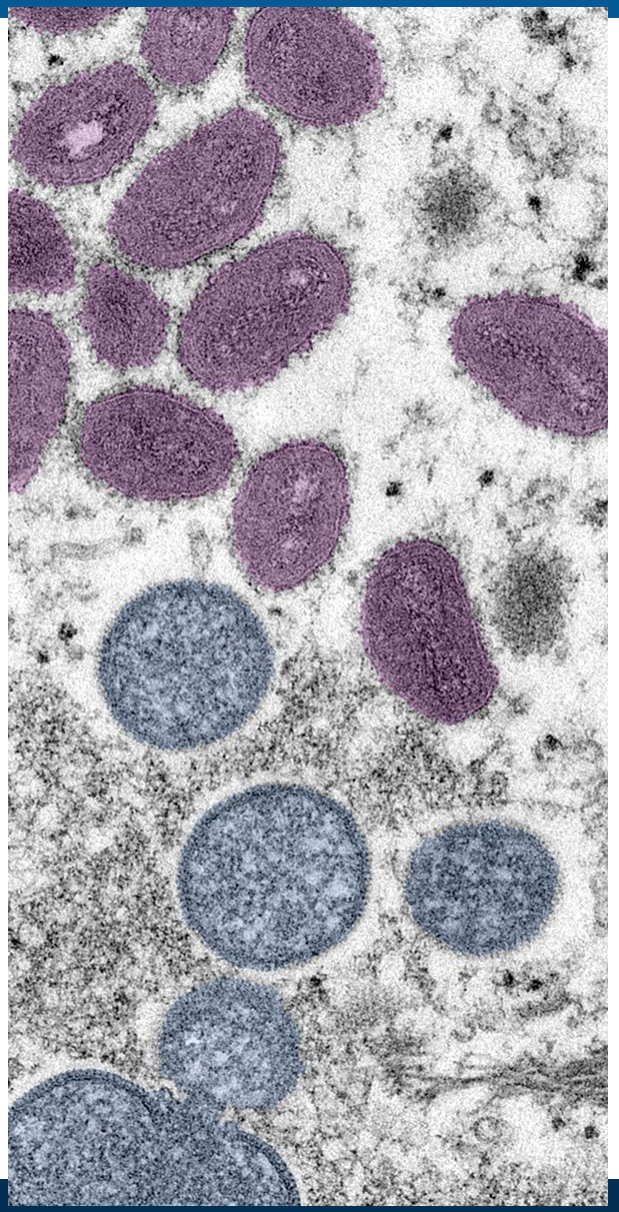
- HBV screening for all pregnant persons during each pregnancy, preferably in the first trimester, regardless of vaccination status or history of testing*
- Pregnant persons with a history of appropriately timed triple panel screening and without subsequent risk for exposure to HBV (i.e., no new HBV exposures since triple panel screening) only need HBsAg screening

Risk-based testing

- Periodic testing for susceptible persons, regardless of age, with ongoing risk for exposures, while risk for exposures persists†

Mpox

- Also known as monkey pox - Caused by the zoonotic monkeypox virus (orthopox virus)
- Endemic in west and central Africa --An unprecedented global outbreak was first detected in May 2022
- Outbreak occurred with little warning, peaked quickly, and waned 5 months after the first case was reported in the United States.
- May 11, 2023 - WHO declared the outbreak no longer a public health emergency – however, a cluster of mpox cases occurred in Chicago (including among some previously vaccinated persons)
- Ongoing Risk for new cases and outbreaks and the need for continued vigilance and prevention efforts



Mpox

-May present with a combination of signs and symptoms that may include:

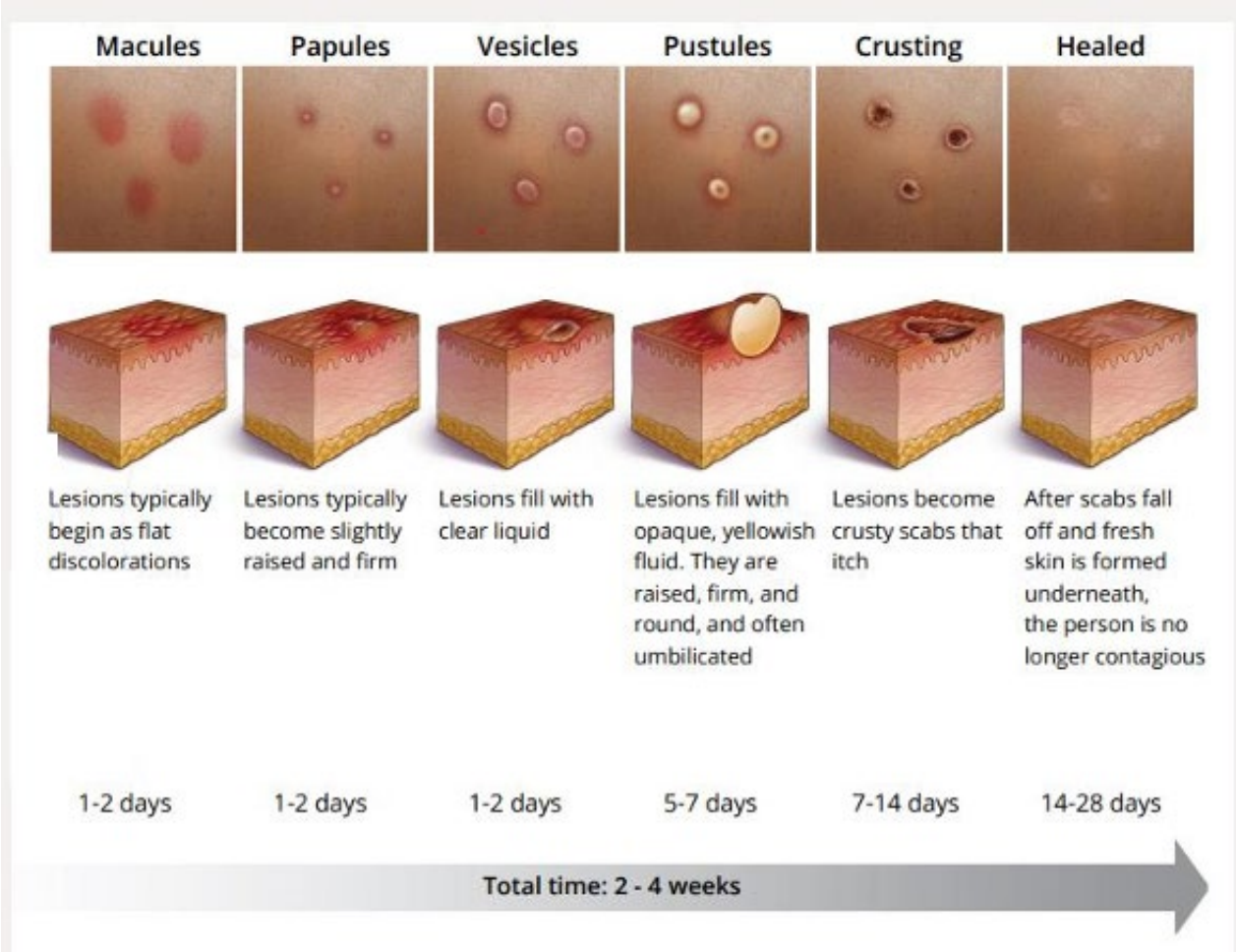
Prodrome: fever, malaise, chills, headache, and lymphadenopathy

Lymphadenopathy: generalized or localized to several areas

Rash

-Rash is the most common manifestation, and it typically evolves from initial macular lesions to form papules, vesicles, and pustules

-Patients can be infectious up to 4 days before symptoms begin,
(whether prodromal or rash symptoms) and remain infectious until lesions form scabs, scabs fall off, and a fresh layer of skin forms



Mpox Transmission

Spread person-to-person through direct contact
—Physical contact with infectious skin rash or scabs
—Touching heavily soiled items (e.g., clothing, linens)
—Placental transfer to fetus

This outbreak in the US - disproportionately affecting young MSM
•Transmission predominately linked to sexual contact
▪Lower burden of lesions
▪Distribution more central (abdomen/pelvis), rather than peripheral (arms/legs/face) ▪Affects both skin and mucosa, especially anus, genitalia and oropharynx

Mpox Vaccine-JYNNEOS Vaccine

- Live virus vaccine—Modified Vaccinia, non-replicating. Produced by Bavarian Nordic (MVA-BN)

- FDA licensed in 2019 to prevent smallpox and mpox in adults ≥18 years old

- May be administered intradermally or subcutaneously for persons ≥18
  - —Subcutaneously for persons <18 under EUA

- Administration in 2 doses at least 4 weeks apart

- Can be used either:
  - —Before potential exposure (pre-exposure prophylaxis)
  - —After exposure (post-exposure prophylaxis)

Mpox Vaccine-JYNNEOS Vaccine

Table 2. Estimated Vaccine Effectiveness against Diagnosed Mpox among Persons Seeking Health Care, August 15 through November 19, 2022.*

Persons Seeking Health Care	Case Patients	Control Patients	Vaccine Effectiveness (95% CI)	
			Unadjusted	Adjusted†
	number		*percent*	
Unvaccinated, reference population	2022	6984		
Partially vaccinated, 1 dose	146	1000	52.0 (42.3–60.1)	35.8 (22.1–47.1)
Fully vaccinated, 2 doses	25	335	77.2 (65.0–85.1)	66.0 (47.4–78.1)

* CI denotes confidence interval.

† Adjustment was for age group (18 to 35, 36 to 49, and ≥50 years), race or ethnic group (non-Hispanic White, non-Hispanic Black, and other non-Hispanic), Social Vulnerability Index quartile (quartile 1 to 4, or unknown), and the presence or absence of an immunocompromising condition.

Deputy NP, Deckert J, Chard AN, Sandberg N, Moulia DL, Barkley E, Dalton AF, Sweet C, Cohn AC, Little DR, Cohen AL, Sandmann D, Payne DC, Gerhart JL, Feldstein LR. Vaccine Effectiveness of JYNNEOS against Mpox Disease in the United States. N Engl J Med. 2023 May 18. doi: 10.1056/NEJMoa2215201. Epub ahead of print. PMID: 37199451.

Mpox Vaccine-JYNNEOS Vaccine

Safe for use in those who are immunocompromised
or have atopic dermatitis

- Safety not established in:
  - Pregnant persons, breastfeeding persons, or children (Animal models using high doses showed no harm to a developing fetus)

- Contraindicated in patients with prior severe allergic reaction to JYNNEOS

- Use with caution in those with allergy to eggs, gentamicin, or ciprofloxacin
  - Produced using chicken embryo fibroblast cells
  - Contains small amounts of gentamicin and ciprofloxacin

Mpox Vaccine-JYNNEOS Vaccine

Currently, CDC does not recommend routine immunization against mpox for the general public.

Mpox vaccination should be offered to:

- People who had known or suspected exposure to someone with mpox
- People who had a sex partner in the past 2 weeks who was diagnosed with mpox

- Gay, bisexual, and other men who have sex with men, and transgender or nonbinary people (including adolescents who fall into any of the these categories) who, in the past 6 months, have had:
  - A new diagnosis of one or more sexually transmitted diseases (e.g., chlamydia, gonorrhea, syphilis); or
  - More than one sex partner.
- People who have had any of the following in the past 6 months:
  - Sex at a commercial sex venue; or,
  - Sex in association with a large public event in a geographic area where mpox transmission is occurring.
  - Sex in exchange for money or other items
- People who are sexual partners of people with the above risks.
- People who anticipate experiencing any of the above scenarios.

Mpox Vaccine-JYNNEOS Vaccine

Mpox vaccination should be offered to (cont'd):

•People with HIV infection or other causes of immunosuppression who have had recent or anticipate potential mpox exposure.

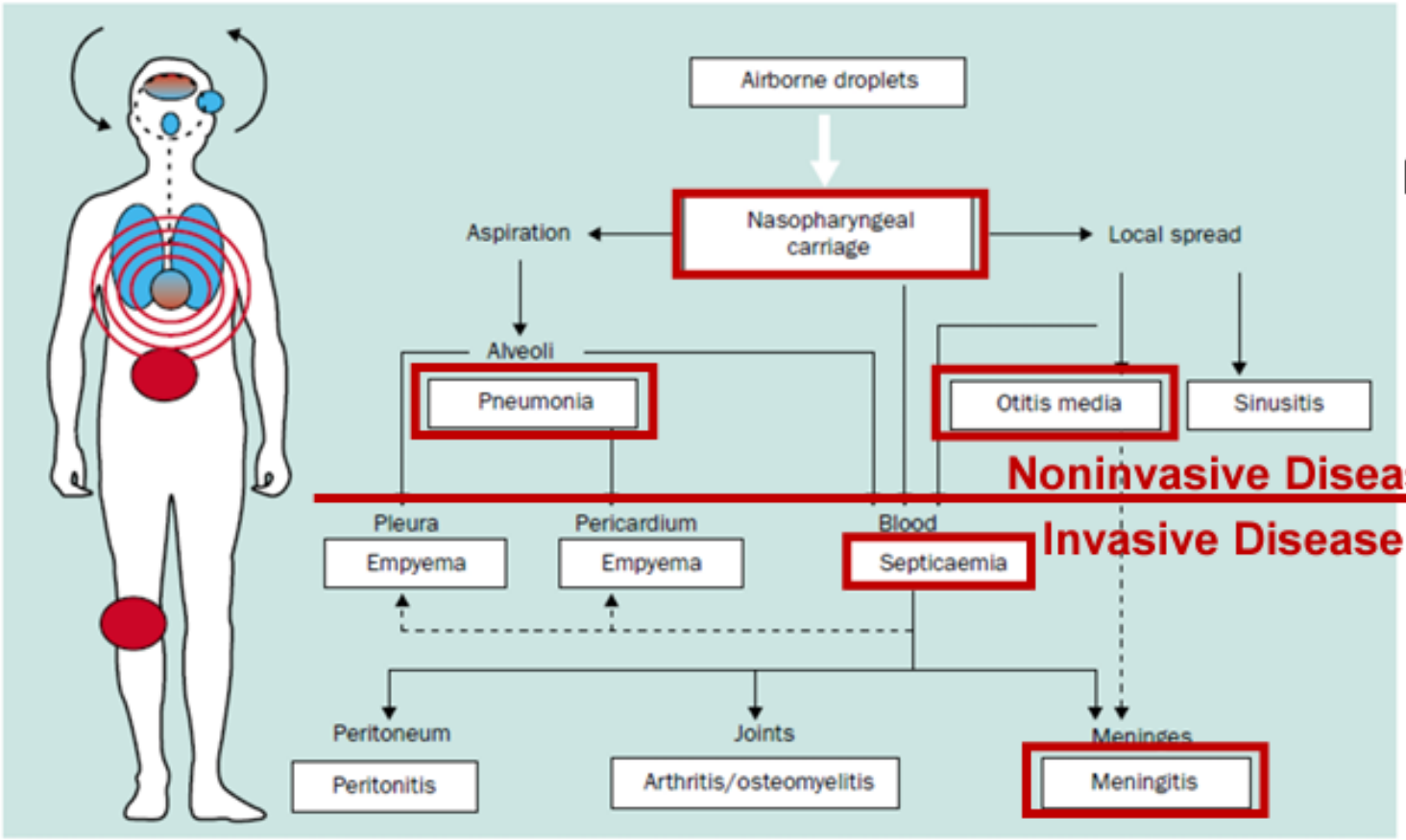
•People who work in settings where they may be exposed to mpox:

- People who work with orthopoxviruses in a laboratory

Pneumococcus

- Streptococcus pneumoniae
- Gram positive cocci
- Classified into “serotypes” based on capsular polysaccharide, which are used as vaccine antigens

Pneumococcal Disease

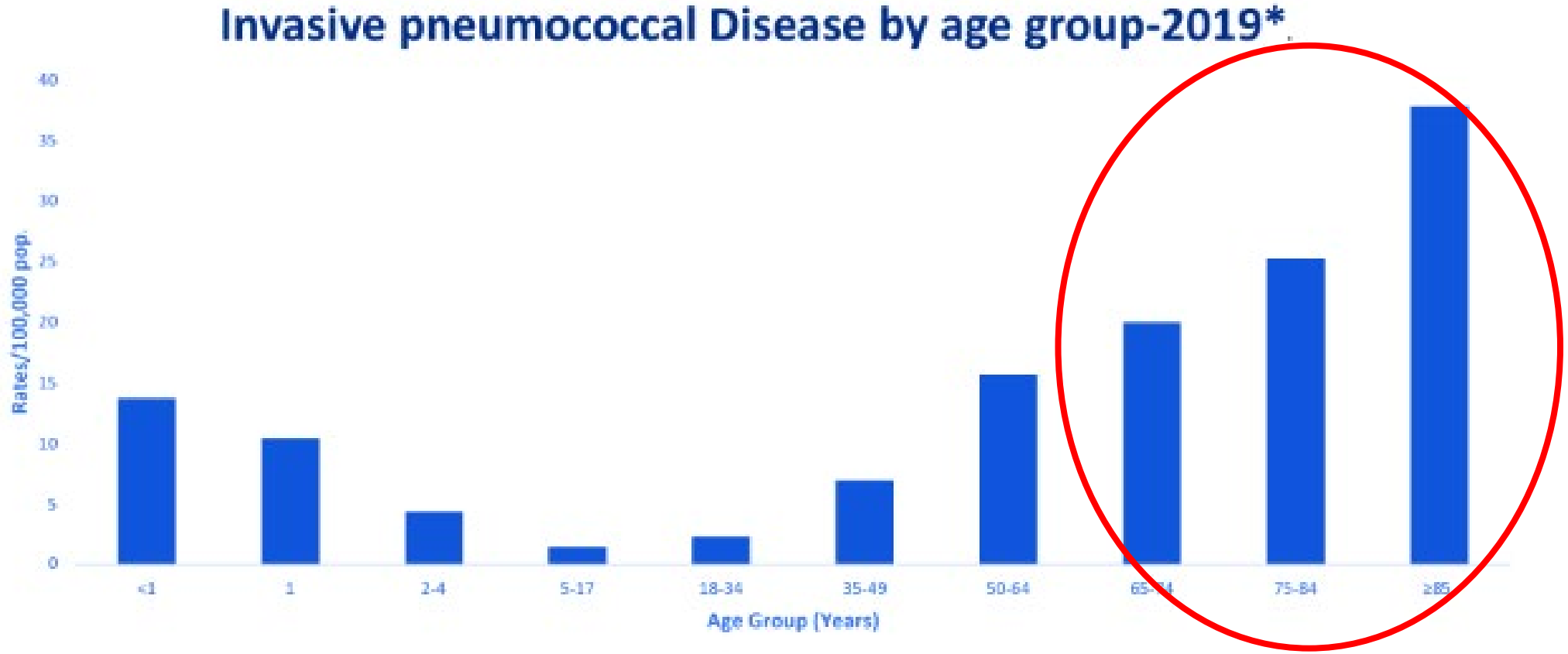


More frequent

Less frequent

Figure 1. Pathogenic route for S pneumoniae infection. Redrawn from reference 2. Organs infected through the airborne and haematogenic routes are depicted in blue and red, respectively.

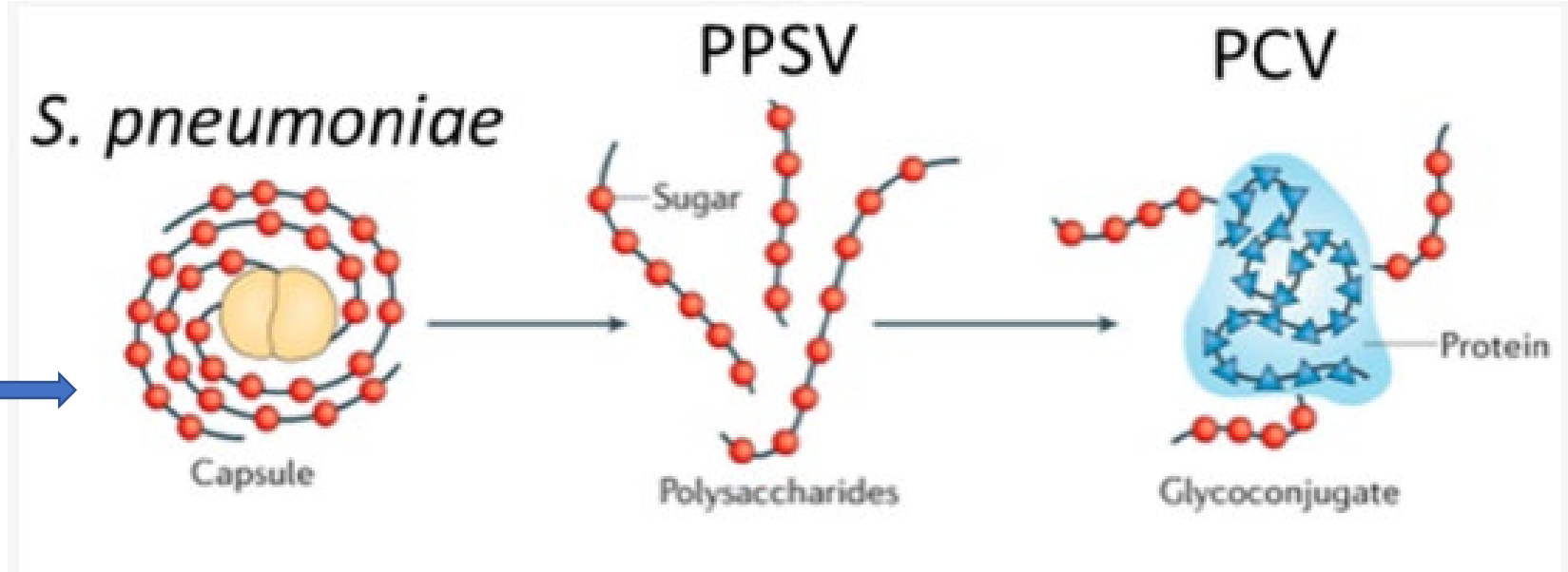
Bogaert. Lancet Infect Dis 2004;4:144-54



All adults 65 years or older should receive pneumococcal vaccination

Pneumococcal Vaccines

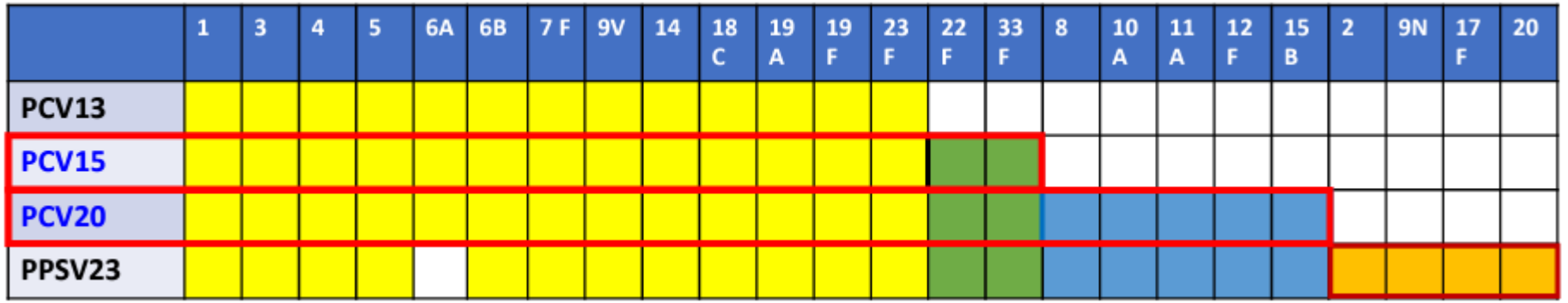
Capsular polysaccharide determines serotype – 100 serotypes



Walkowski W, Bassett J, Bhalla M, Pfeifer BA, Ghanem ENB. Intranasal Vaccine Delivery Technology for Respiratory Tract Disease Application with a Special Emphasis on Pneumococcal Disease. Vaccines. 2021; 9(6):589. https://doi.org/10.3390/vaccines9060589

Pneumococcal Vaccines

In 2021 - 2 new pneumococcal conjugate vaccines were licensed for use in U.S. adults.



13-valent pneumococcal conjugate vaccine (PCV13)	Prevnar13, Pfizer (2011 adults)
15-valent pneumococcal conjugate vaccine (PCV15)	Vaxneuvance, Merck (2021)
20-valent pneumococcal conjugate vaccine (PCV20)	Prevnar20, Pfizer (2021)
23-valent pneumococcal polysaccharide vaccine (PPSV23)	Pneumovax23, Merck (1983)

PCV13 is not used in adults

Pneumococcal Vaccination recommendations

15-valent PCV (PCV15) or 20-valent PCV (PCV20) for PCV–naïve adults who are either:

- aged ≥65 years

  or

- aged 19–64 years with certain underlying conditions.

When PCV15 is used, it should be followed by a dose of PPSV23, typically ≥1 year later.

Underlying conditions in 19 to 64 years

Alcoholism
Chronic heart, liver, or lung disease
Chronic renal failure
Cigarette smoking;
Cochlear implant
Congenital or acquired asplenia
Cerebrospinal fluid leak
Diabetes mellitus
Generalized malignancy
HIV
Hodgkin disease
Immunodeficiency/iatrogenic immunosuppression
Leukemia, lymphoma, or multiple myeloma
Nephrotic syndrome
Solid organ transplant
Sickle cell disease or other hemoglobinopathies

Pneumococcal Vaccine Timing for Adults

Make sure your patients are up to date with pneumococcal vaccination.

Adults ≥65 years old
Complete pneumococcal vaccine schedules

Prior vaccines	Option A	Option B
None*	**PCV20**	**PCV15** → ≥1 year† → **PPSV23**
PPSV23 only at any age	≥1 year → **PCV20**	≥1 year → **PCV15**
PCV13 only at any age	≥1 year → **PCV20**	≥1 year† → **PPSV23**
PCV13 at any age & **PPSV23** at <65 yrs	≥5 years → **PCV20**	≥5 years§ → **PPSV23**

* Also applies to people who received PCV7 at any age and no other pneumococcal vaccines
† Consider minimum interval (8 weeks) for adults with an immunocompromising condition, cochlear implant, or cerebrospinal fluid leak (CSF) leak
§ For adults with an immunocompromising condition, cochlear implant, or CSF leak, the minimum interval for PPSV23 is ≥8 weeks since last PCV13 dose and ≥5 years since last PPSV23 dose; for others, the minimum interval for PPSV23 is ≥1 year since last PCV13 dose and ≥5 years since last PPSV23 dose

Shared clinical decision-making for those who already completed the series with PCV13 and PPSV23

Prior vaccines	Shared clinical decision-making option
Complete series: **PCV13** at any age & **PPSV23** at ≥65 yrs	≥5 years → **PCV20** Together, with the patient, vaccine providers **may choose** to administer PCV20 to adults ≥65 years old who have already received PCV13 (but not PCV15 or PCV20) at any age and PPSV23 at or after the age of 65 years old.

Pneumococcal vaccination tips

PCV vaccines should not be administered at the same time as PPSV23 – ideally one year between PCV and PPSV23

PCV15, PCV20, PPSV23 can be co-administered with a quadrivalent influenza vaccine.

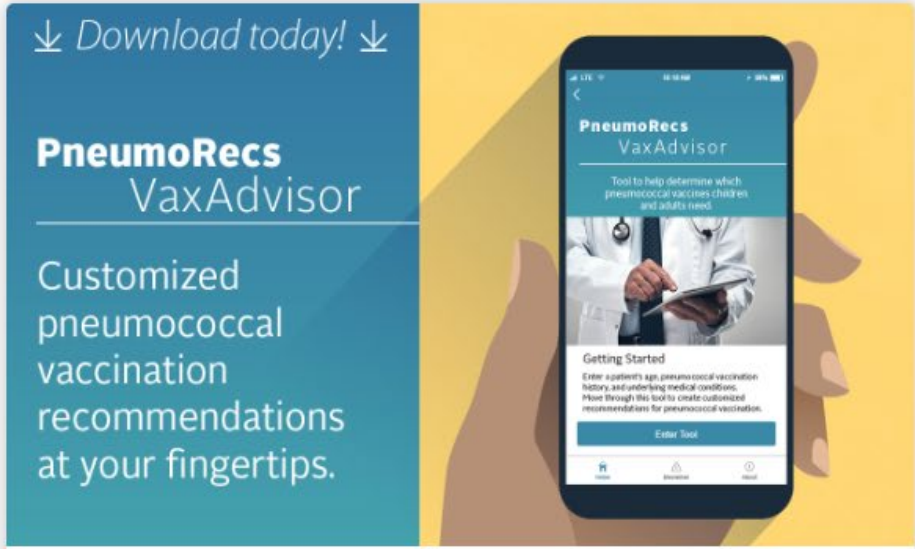
Vaccinator resources

CDC Vaccine Schedules App for Healthcare Providers

CDC VACCINE SCHEDULES

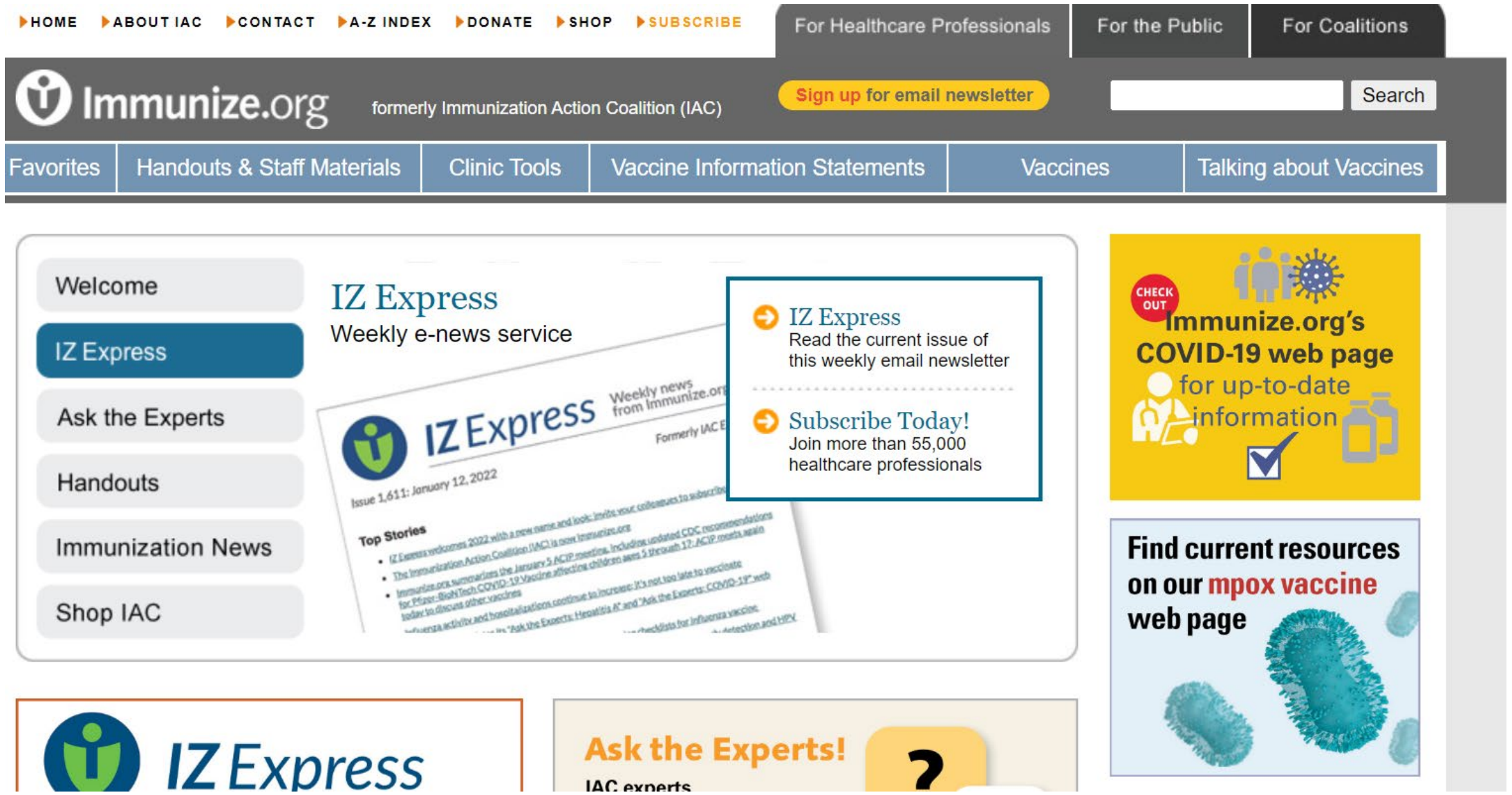
Download "CDC Vaccine Schedules" free for iOS and Android devices.

Download the app



PneumoRecs VaxAdvisor is available for download on iOS and Android mobile devices.

Vaccinator resources



Thank you!!

Questions?