# Vaccine Update for Adults

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ACIC

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# Outline of Topics to Cover

- COVID NOW
  - Long COVID
- COVID-19 Vaccines
  - Myocarditis/Pericarditis
- Tdap vaccine
- Hepatitis B vaccines
- Zoster vaccine
- Pregnancy
- Travel
- PCP reporting to VAERS

# Current CDC Vaccines

- ACIP Vaccine-Specific Recommendations | CDC

## Vaccine-Specific ACIP Recommendations

- Anthrax
- BCG
- Cholera
- COVID-19
- Dengue
- DTaP-IPV-Hib-HepB
- DTaP/Tdap/Td
- Ebola
- Hepatitis A
- Hepatitis B
- Hib
- HPV
- Influenza
- Japanese Encephalitis
- Measles, Mumps and Rubella
- MMRV
- Meningococcal
- Orthopoxviruses (Smallpox and Monkeypox)
- Pneumococcal
- Polio
- Rabies
- Rotavirus
- Typhoid
- Varicella (Chickenpox)
- Yellow Fever
- Zoster (Shingles)

Nirsevimab; chikungunya; malaria; others!

## Table 1 Recommended Adult Immunization Schedule by Age Group, United States, 2024

| Vaccine | 19–26 years | 27–49 years | 50–64 years | ≥65 years |
|---|---|---|---|---|
| **COVID-19** | 1 or more doses of updated (2023–2024 Formula) vaccine (See Notes) | | | |
| **Influenza inactivated** (IIV4) or **Influenza recombinant** (RIV4) | 1 dose annually | | | |
| **Influenza live, attenuated** (LAIV4) | or 1 dose annually | | | |
| **Respiratory Syncytial Virus** (RSV) | Seasonal administration during pregnancy. See Notes. | | | ≥60 years |
| **Tetanus, diphtheria, pertussis** (Tdap or Td) | 1 dose Tdap each pregnancy; 1 dose Td/Tdap for wound management (see notes) | | | |
| | 1 dose Tdap, then Td or Tdap booster every 10 years | | | |
| **Measles, mumps, rubella** (MMR) | 1 or 2 doses depending on indication (if born in 1957 or later) | | | For healthcare personnel, see notes |
| **Varicella** (VAR) | 2 doses (if born in 1980 or later) | | 2 doses | |
| **Zoster recombinant** (RZV) | 2 doses for immunocompromising conditions (see notes) | | 2 doses | |
| **Human papillomavirus** (HPV) | 2 or 3 doses depending on age at initial vaccination or condition | 27 through 45 years | | |
| **Pneumococcal** (PCV15, PCV20, PPSV23) | | | | See Notes<br>See Notes |
| **Hepatitis A** (HepA) | 2, 3, or 4 doses depending on vaccine | | | |
| **Hepatitis B** (HepB) | 2, 3, or 4 doses depending on vaccine or condition | | | |
| **Meningococcal A, C, W, Y** (MenACWY) | 1 or 2 doses depending on indication, see notes for booster recommendations | | | |
| **Meningococcal B** (MenB) | 19 through 23 years | 2 or 3 doses depending on vaccine and indication, see notes for booster recommendations | | |
| ***Haemophilus influenzae* type b** (Hib) | 1 or 3 doses depending on indication | | | |
| **Mpox** | | | | |

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

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

Recommended vaccination based on shared clinical decision-making

No recommendation/ Not applicable

Recommended Adult Immunization Schedule for ages 19 years or older (cdc.gov)

# Vaccinations for Adults

## You're never too old to get vaccinated!

*Getting vaccinated is a lifelong, life-protecting job. Don't leave your healthcare provider's office without making sure you've had all the vaccinations you need.*

| Vaccine | Do you need it? |
|---|---|
| **COVID-19** | ***Yes!*** All adults need to be up to date on COVID-19 vaccination. Talk to your healthcare provider. |
| **Hepatitis A** (HepA) | ***Maybe.*** You need this vaccine if you have a specific risk factor for hepatitis A* or simply want to be protected from this disease. The vaccine is usually given in 2 doses, 6–18 months apart. |
| **Hepatitis B** (HepB) | ***Yes!*** All unvaccinated adults younger than 60 are recommended to complete a 2- or 3-dose series of hepatitis B vaccine, depending on the brand. You also need this vaccine if you are 60 or older and have a specific risk factor,* or you simply want to be protected from infection. All adults should be screened for hepatitis B infection with a blood test at least one time; talk with your healthcare provider. |
| **Hib** (*Haemophilus influenzae* type b) | ***Maybe.*** Some adults with certain high-risk conditions need vaccination with Hib. Talk to your healthcare provider to find out if you need this vaccine. |
| **Human papillomavirus** (HPV) | ***Yes!*** You should get this vaccine if you are 26 years or younger. Adults age 27 through 45 may also choose to be vaccinated after a discussion with their healthcare provider.* The vaccine is usually given in 2 or 3 doses, depending on the age at which the first dose was given. |
| **Influenza** (Flu) | ***Yes!*** You need to be vaccinated against influenza every fall or winter. |
| **Measles, mumps, rubella** (MMR) | ***Maybe.*** You need at least 1 dose of MMR if you were born in 1957 or later. You may also need a second dose.* Pregnant people and people with a severely weakened immune system should not get MMR.* |
| **Meningococcal ACWY** (MenACWY, MenABCWY) | ***Maybe.*** You may need MenACWY vaccine if you have one of several health conditions* and also if your risk is ongoing. You also will need this vaccine if you are a first-year college student living in a residence hall and (1) you have not had a dose since turning 16, or (2) it has been more than 5 years since your last dose. Anyone age 19 through 21 can have a catch-up dose if they have not had one since turning 16. A combination MenABCWY is an option when both MenB and MenACWY vaccines are needed. |
| **Meningococcal B** (MenB, MenABCWY) | ***Maybe.*** You may need MenB if you have one of several health conditions* and boosters if your risk is ongoing. If you are age 16 through 23, you can discuss getting MenB vaccine with your healthcare provider, even if you don't have a high-risk condition. A combination MenABCWY is an option when both MenACWY and MenB vaccines are needed. |
| **Mpox** | ***Maybe.*** You need the 2-dose series of mpox vaccine (Jynneos) if you are at risk due to known or suspected exposure to someone with mpox or if you have certain sexual practices that increase your risk of exposure to mpox.* Talk with your healthcare provider. |

| | |
|---|---|
| **Pneumococcal** (PCV, PPSV23) | *Yes!* All adults age 50 and older need pneumococcal vaccination. Adults younger than 50 with certain underlying health conditions or other risk factors* also need pneumococcal vaccination. Newer vaccines may be recommended now for people vaccinated in the past. Your healthcare provider can determine what vaccine, if any, you need. |
| **Respiratory Syncytial Virus** (RSV) | *Yes!* You should get this one-time vaccine if you are 75 years or older, or if you are between the ages of 60 and 74 and are at increased risk of severe RSV. To protect infants from RSV, either the pregnant person should be vaccinated with Abrysvo (Pfizer) RSV vaccine, or the infant should be given RSV preventive antibody (nirsevimab). |
| **Tetanus, diphtheria, pertussis** (Tdap, Td) | *Yes!* If you have never received a dose of Tdap, you need to get a Tdap shot now. After that, you need a Tdap or Td booster dose every 10 years. Consult your healthcare provider if you haven't had at least 3 tetanus- and diphtheria-toxoid containing shots in your life or if you have a deep or dirty wound. |
| **Varicella** (Chickenpox) | *Maybe.* If you have never had chickenpox, never were vaccinated, or were vaccinated but only received 1 dose, talk to your healthcare provider to find out if you need this vaccine. Pregnant people and people with a severely weakened immune system should not get varicella vaccine. |
| **Zoster** (Shingles) | *Yes!* If you are 19 or older and have a weakened immune system or are 50 or older, you should get a 2-dose series of the Shingrix brand of shingles vaccine. |

* Consult your healthcare provider to determine your level of risk for infection and your need for this vaccine.

**Are you planning to travel outside the United States?** Visit the Centers for Disease Control and Prevention's (CDC) website at wwwnc.cdc.gov/travel/destinations/list for travel information, or consult a travel clinic.

Immunize.org

**FOR PROFESSIONALS** www.immunize.org / **FOR THE PUBLIC** www.vaccineinformation.org

www.immunize.org/catg.d/p4030.pdf

Item #P4030 (10/30/2024)

Scan for PDF

Vaccinations for Adults from IAC

# Vaccine Rules

- Doses given before minimum age/interval usually must be repeated; 4 days grace period
- All doses given at or beyond proper age and recommended dosing interval count for all time
- Some doses given at less than recommended interval still count and should not be repeated, e.g., PCV and PPSV given in error on same day are both counted and not repeated, but a 2nd dose of hepatitis A given before 6 months after 1st dose must be repeated
- QUESTIONS to CDC are answered quickly and accurately: NIPINFO@cdc.gov or call 800-CDC-INFO (800-232-4636)
- DO NOT BECOME VACCINE FATIGUED
- More vaccines are better for everyone BUT keeping up is difficult
- Your DNA does nothing to protect you: mRNA is the worker bee

# My Vaccine Thoughts

- COVID changes often and is likely NOT seasonal. Vaccine Q6-12 months is likely needed. The public and many vaccinators are tried of vaccinating against it BUT DON'T BE! New vaccine formulation is here.
- RSV (types A and B) doesn't change much. A dose of vaccine likely lasts for 3 years or more. I think age ≥60 yrs. should be vaccinated. CDC says ≥75 yrs.
- Zoster: age 19 and above immunocompromised plus age ≥50 yrs
- Hepatitis A and B vaccines: may be given during pregnancy
- Flu vaccine (late summer) and COVID vaccine (any time) given during the 3rd trimester of pregnancy might protect the newborn until the infant is old enough to be vaccinated.
- RSV vaccine (32-36 wks) can be given during pregnancy, but is it as good as nirsevimab?
- Don't confuse precautions with contraindications which are basically anaphylaxis after prior except for lives vaccines not for immunocompromised; fever is NOT a contraindication!
- Most adult vaccines are ≥60% effective against clinical disease.
- How to use some vaccines is in question. For example, dengue.
- Do not forget:
  - HPV up to age 45yrs.
  - Tdap Q10 yrs + with pregnancy wks 27-36 gestation (really works!)
  - HepB up to age 60 yrs + older if certain diseases

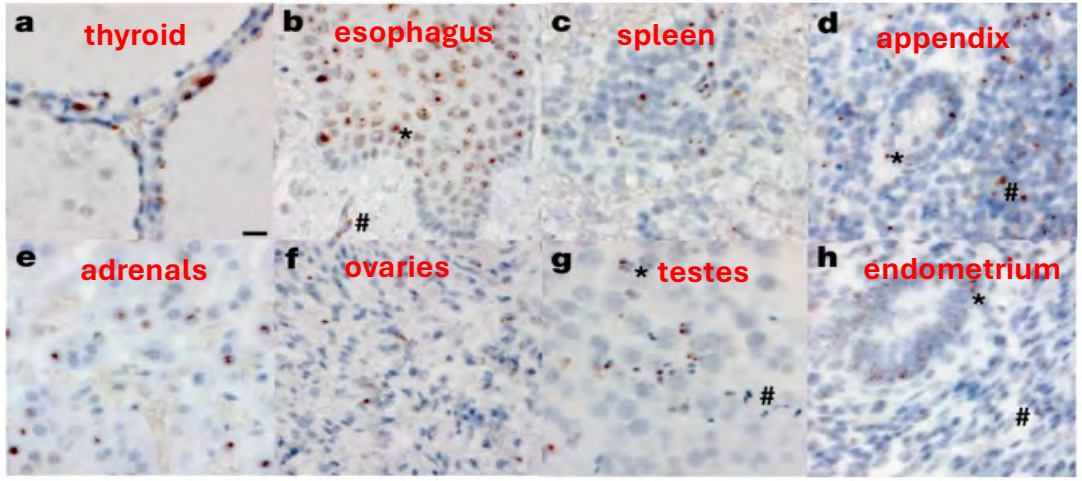
# Adult Vaccination Rates 2024

- 14% decline since 2019 in doses given
- Flu: 48%
  - 190 million doses manufactured for 2024-25
- COVID: 22%
- RSV 60 yrs. and over: 22%
- Hepatitis B: 34%
- Zoster 50+ (2022): 16% (CDC says 32% overall)
- Adult Immunization Status - NCQA
- Vaccination Trends—Adults (cdc.gov)

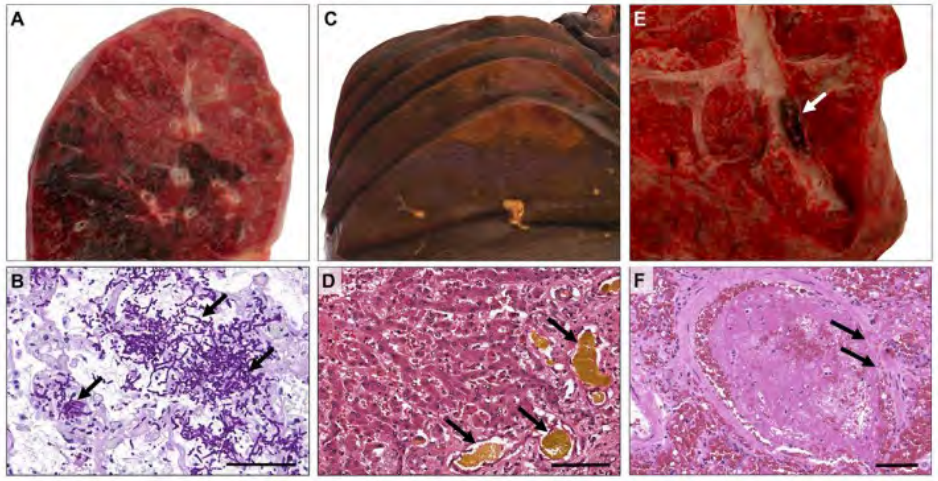
# COVID Facts (NOT GONE!)

- Number of deaths related to COVID-19 through 10/26/24: 40,905 (9/hr); COVID as the primary cause of death: 26,997
  - Provisional COVID-19 Mortality Surveillance
  - Cervical cancer deaths: 4,360 in 2023
- ILI test positivity for COVID infection now (10/26/2024): 5.5%
- Hospitalizations now: 1000 to 2000 past 4 weeks
- Mortality rate now: 1.5% of all deaths
- Deaths now: 261 to 905 past 4 weeks
- 234,000 children admitted with COVID 2020 to 2023 (AAP News 4/1/24)
- Post-COVID conditions: breathing difficulties, fatigue, type 2 diabetes, poor sleep, and psychological conditions predominate. Incidence in primary care about 10% while in specialty care 20-50%.
  - The Annals of Family Medicine. July 2024, 22(4) 279-287; DOI:https://doi.org/10.1370/afm.3131
- 72% of reduced disease attributable to vaccine; 28% to prior infection and virus change
  - Post Acute Sequelae of SARS-CoV-2 Infection in the Pre-Delta, Delta, and Omicron Eras | New England Journal of Medicine (nejm.org) NEJM 2024, 391:515
- CDC COVID Data Tracker: Home
- Provisional COVID-19 Mortality Surveillance

# Autopsies following death from COVID-19 indicate widespread presence of SARS-CoV-2 and damage across organ systems

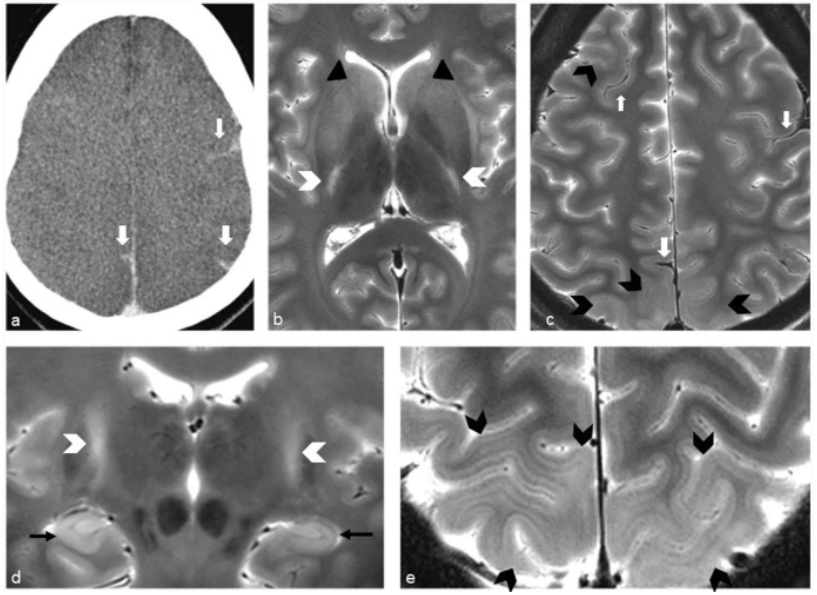



Autopsies on 44 patients who died with COVID-19 showed that **SARS-CoV-2 is widely distributed** beyond the lungs, including in the brain, early in infection[3].




**Clotting in the lungs and the liver** in 26yo 30yo and 45yo[1]

**The presence of SARS-CoV-2 results in ABNORMAL BLOOD CLOTTING, INCREASED INFLAMMATION and DAMAGE TO BLOOD VESSELS**

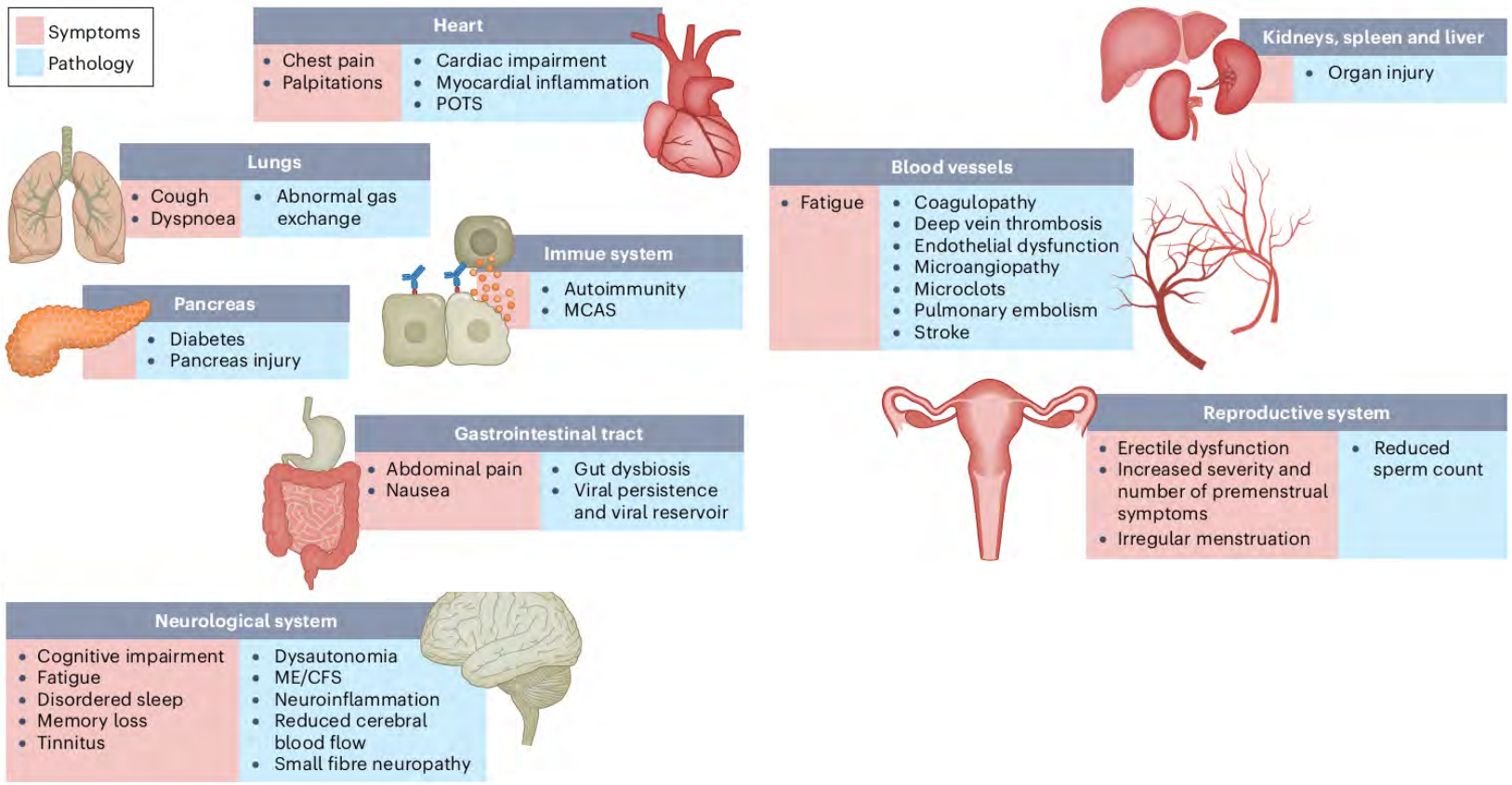



Evidence **for bleeding and swelling** (edema) in the brain of a 39yo following death from COVID-19. SARS-CoV-2 was detected by PCR in the brain.[2]

1. Greuel, Selina, et al. International Journal of Infectious Diseases 108 (2021): 274-281. 2. Martin, M. et al. *Insights Imaging* **13**, 7 (2022). 3. Stein, SR. et al. *Nature* **612**, 758–763 (2022).

# Long COVID Impacts Multiple Organ Systems

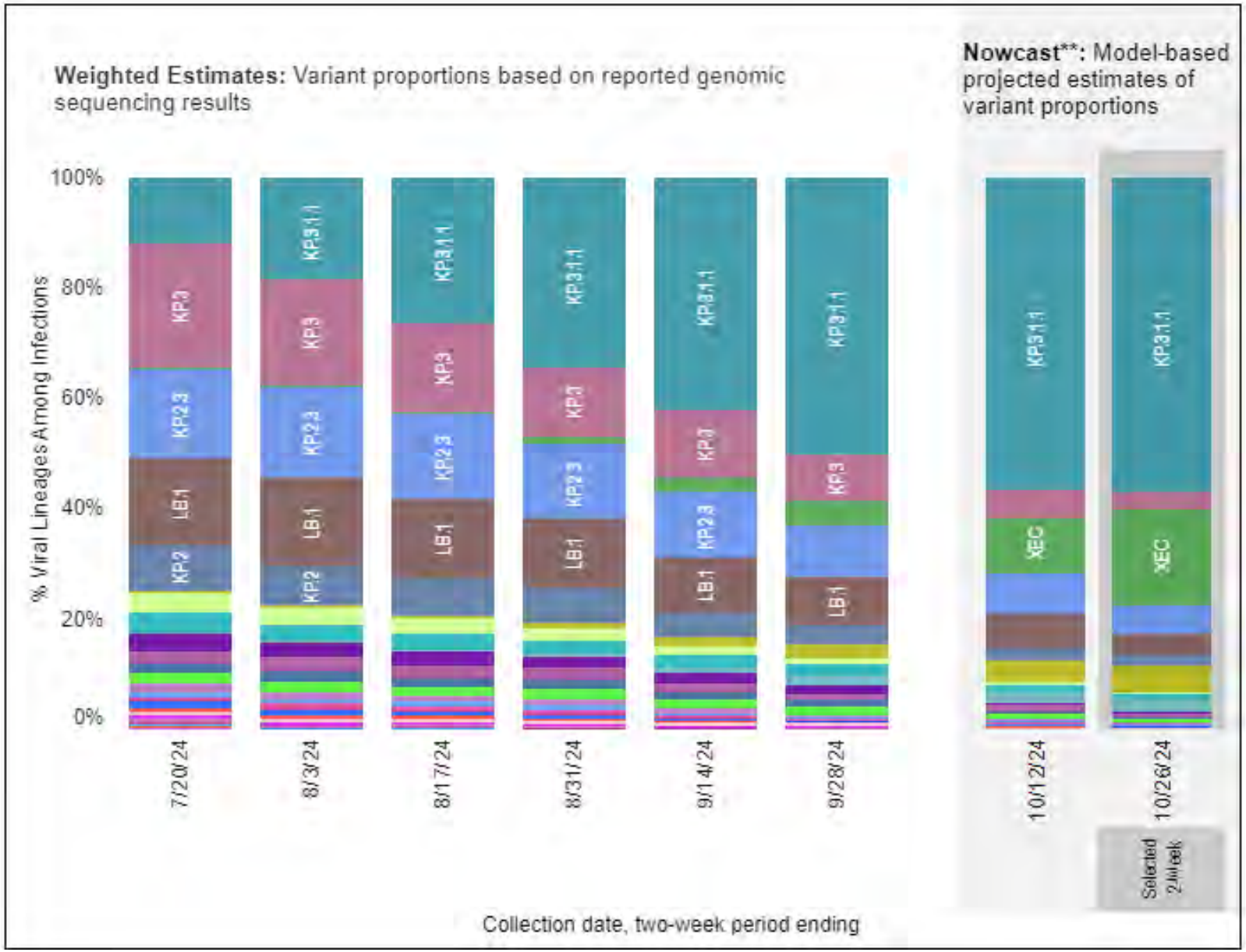
**Long COVID symptoms and the impacts on numerous organs with differing pathology[1]**




- **More than 200 symptoms of long COVID have been identified[1,2]**
  - **Many patients experience dozens of symptoms across multiple organ systems[1,2]**
- **Common new-onset conditions associated with long COVID include cardiovascular, thrombotic and cerebrovascular disease, type 2 diabetes, ME/CFS, and dysautonomia[1-7]**

- CFS, chronic fatigue syndrome; COVID, coronavirus disease; MCAS, mast cell activation syndrome; ME, myalgic encephalomyelitis; POTS, postural orthostatic tachycardia syndrome.
- 1. Davis H, et al. *Nat Rev Microbiol*. 2023;21(3):133-146. 2. Davis H, et al. *EClinicalMedicine*. 2021;38:101019. 3. Larsen NW, et al. *Front Neurol*. 2022;13:1012668. 4. Xie Y, et al. *Nat Med*. 2022;28(3):583-590. 5. Xie Y, et al. *Lancet Diabetes Endocrinol*. 2022;10(5):311-321. 6. Mancini DM, et al. *JACC Heart Fail*. 2021;9(12):927-937. 7. Kedor C, et al. *Nat Commun*. 2022;13(1):5104.

# COVID Variants




[CDC COVID Data Tracker: Variant Proportions]


Penn Medicine

October 2, 2023

- **Katalin Karikó and Drew Weissman, Penn's Historic mRNA Vaccine Research Team, Win 2023 Nobel Prize in Medicine**

- Highest Honor Bestowed for Foundational Discoveries that Gave the World a Vaccine to Fight COVID-19 Pandemic

# COVID Vaccines

- ONLY NEW MONOVALENT: KP.2 (descendant of JN.1; covers KP.3); most get 1 dose -- age 5 yrs and up; vaccine here (I got mine!); FDA approved 8/22/24; most given in pharmacies
  - Pfizer mRNA: $115; 3 doses for children ages 6 mos to 4 yrs
  - Moderna mRNA: $128; 2 doses for children ages 6 mos to 4 yrs
  - Refrigerator storage for 60 days; room temperature for 12 hours
- People aged 65 yrs and older should receive 2 doses of any COVID vaccine 6 mos apart
- Novavax has protein vaccine, adjuvanted with Matrix M for those who do not want mRNA or had bad reaction: $137; age 12 yrs and up; if no prior vaccine 2 doses

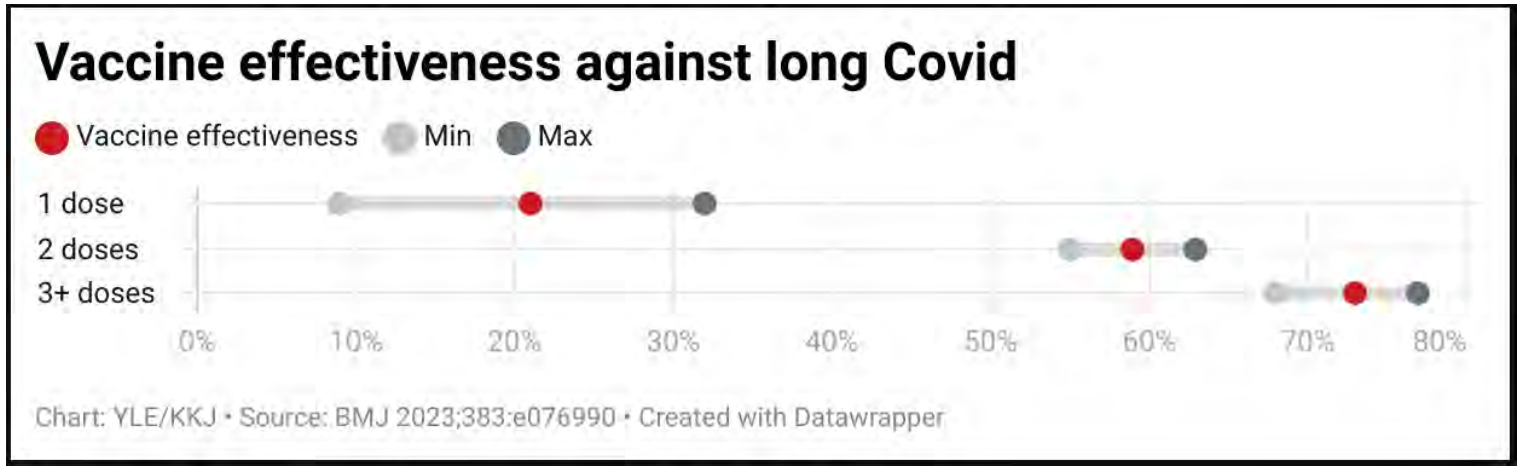
1. Novavax EUA Website: https://us.novavaxcovidvaccine.com/hcp

CDC's Interim Clinical Considerations for Use of COVID-1 Vaccines in the United States

Clinical Considerations for the use of 2024-2025 COVID-19 Vaccines in the United States

# COVID-19 Vaccination Shows a 73% Reduction in Risk of Suffering from Long COVID - Sweden

Swedish study of 299,692 vaccinated, and 290,030 unvaccinated individuals




Diagnosis of Long COVID during follow-up was **3.5x higher for those who were not vaccinated** compared to those who were vaccinated.

Vaccine effectiveness against Long COVID for one dose, two doses, and three or more doses was 21%, 59%, and 73%, respectively.

**"The findings suggest a strong association between receiving the first three doses of vaccine before covid-19 and a reduced risk of receiving a diagnosis of [long COVID]. The results highlight the importance of primary vaccination against covid-19 to reduce the burden of [long COVID] in the population."**

- Lundberg-Morris et al; BMJ 2023;383:e076990

# AEs reported post bivalent booster appear consistent with AEs reported post monovalent booster

Events reported Vaccine Adverse Event Reporting System for persons aged ≥12 years after receipt of a bivalent Pfizer-BioNTech (N= 2928) or Moderna (N=2615) COVID-19 vaccine booster dose between August 31–October 23, 2022 (N=5542)

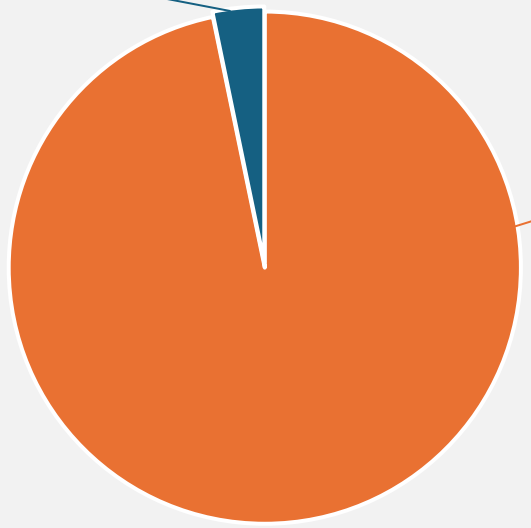
**KEY FINDINGS**

**3.3% serious**

Serious AEs **3.3%**

| | |
|---|---|
| **Allergic reaction/anaphylaxis** | 2 |
| **Appendicitis** | 1 |
| **Arrythmia** | 5 |
| **COVID-19** | 6 |
| **Death** | 9 |
| **Dyspnea** | 1 |
| **Fall** | 6 |
| **Guillain-Barré syndrome** | 0 |
| **Hypertension, acute** | 3 |
| **Pericarditis** | 3 |
| **Pneumonia** | 1 |
| **Thrombotic event** | 11 |
| **Chest pain, not otherwise specified** | 3 |
| **Myocardial infarction** | 3 |
| **Myocarditis** | 2 |

**Moderna**
N=2615



**96.8% non-serious**
(Top 10)

| | |
|---|---|
| **Headache** | 285 (11.3) |
| **Fatigue** | 257 (10.2) |
| **Fever** | 262 (10.4) |
| **Pain** | 231 (9.1) |
| **Chills** | 205 (8.1) |
| **Pain in extremity** | 167 (6.6) |
| **Nausea** | 144 (5.7) |
| **Dizziness** | 135 (5.3) |
| **Injection site pain** | 121 (4.8) |
| **COVID-19** | 89 (3.5) |

**1037 (39.7%) vaccination errors**
93.7% without adverse health events

AE, adverse event; VAERS, Vaccine Adverse Event Reporting System.
Hause AM, et al. *MMWR Morb Mortal Wkly Rep* 2022;71;1401–06.

# Pericarditis/Myocarditis

Symptoms include chest pain:

- Sharp and stabbing (myocardium rubs against pericardium)
- Worsens with cough, swallow, deep breaths or lying flat
- Feels better sitting up and leaning forward (pericarditis)

Other symptoms include:

- Pain in the back, neck or left shoulder
- Trouble breathing when lying down
- Dry cough
- Palpitations
- Anxiety
- Fatigue (myocarditis)
- Fever
- Swelling of lower extremities in severe cases

Signs:

•Changes in vital signs

•Shock (ie diaphoresis, clamminess, tachycardia, decreased blood pressure)

•Pulsus paradoxus: BP drops with inspiration (≥10 mmHg)

•Elevated jugular venous pressure (JVP)

•Changes in heart or lung sounds: rub, distant sounds

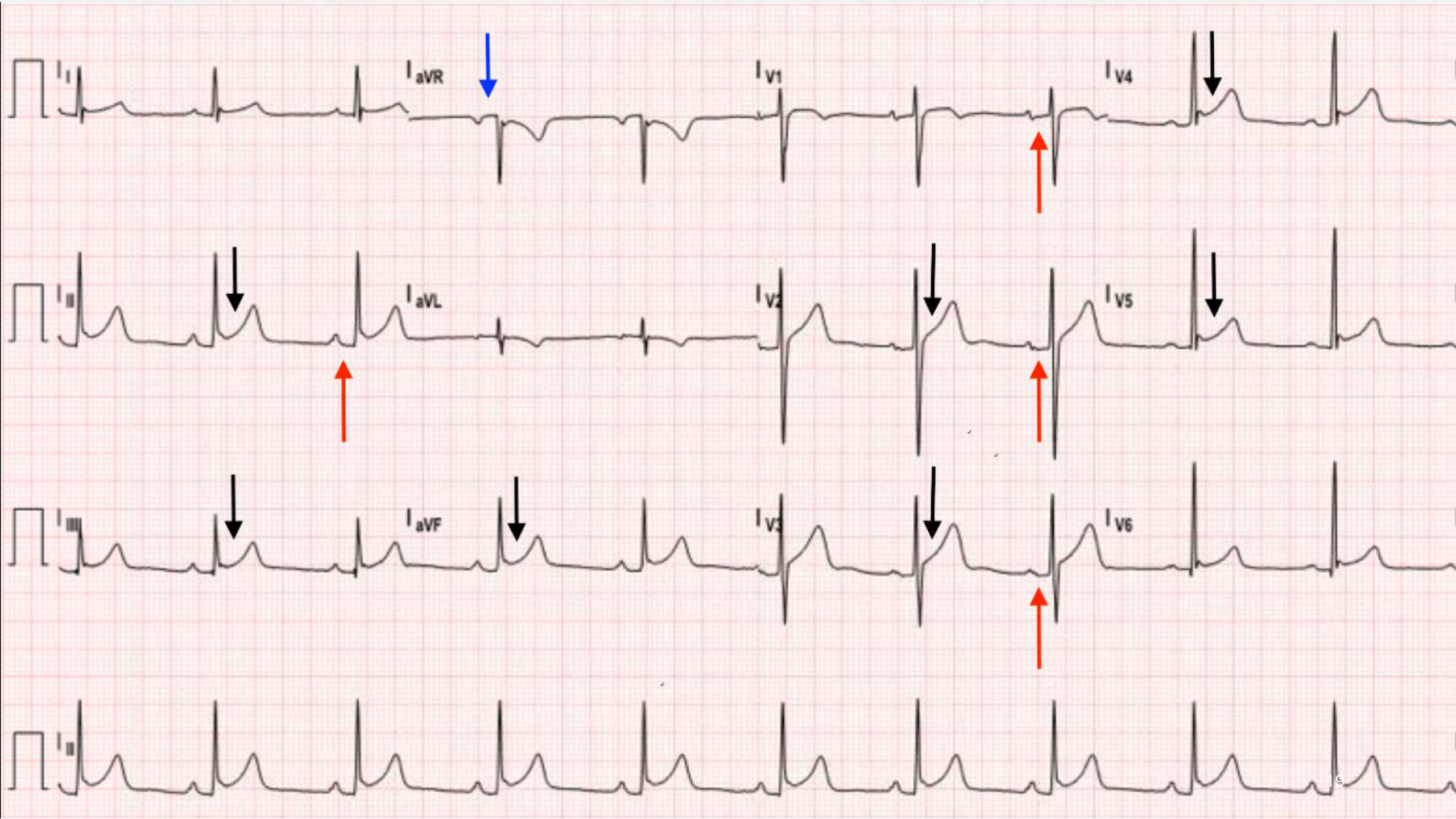
•Peripheral edema

Lab:

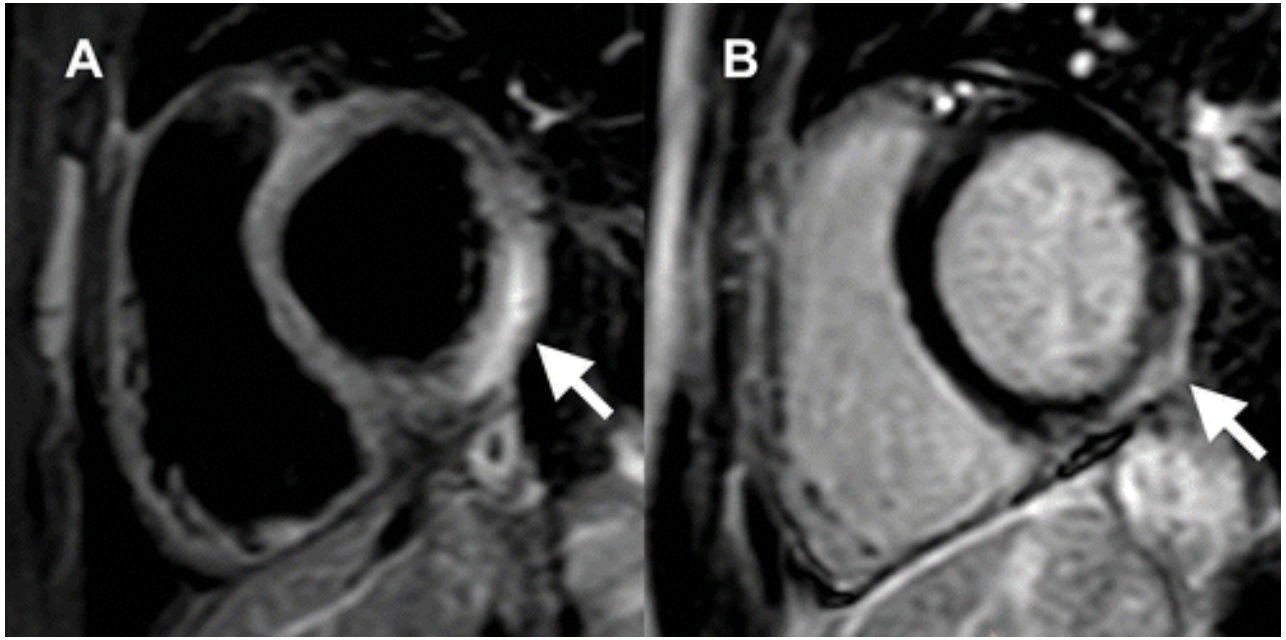
•High troponin

•High CRP

•Chest radiograph, ECHO, MRI abnormal


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II

# MRI of Heart after COVID Vaccine with Myocarditis



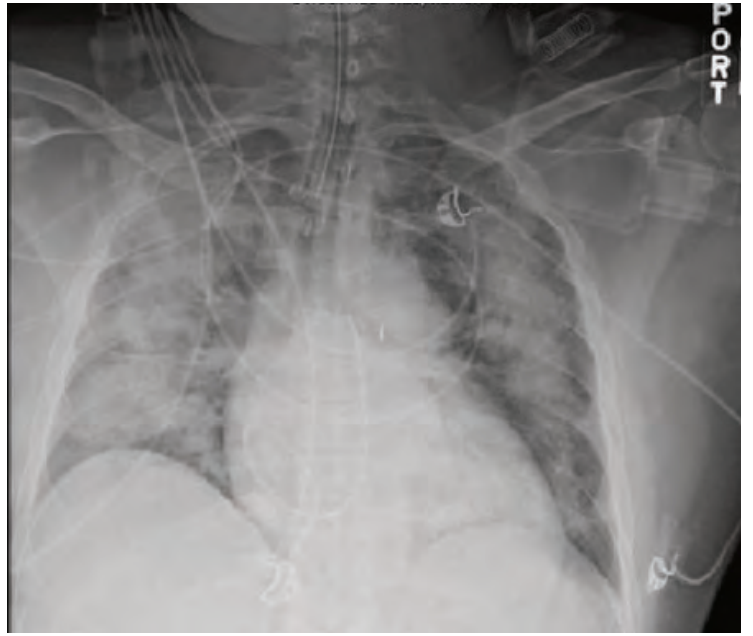
# Pericarditis/Myocarditis: Prior Vaccine Data

- Onset within 1-7 days
- Young men ages 12-35 yrs highest risk
- 1 in perhaps 200,000 after first dose
- Second shot highest risk; boosters less so; rate after repeated doses unknown
- Cross reaction SARS-CoV-2 spike protein antibodies and tissue proteins, including the myocardial contractile protein α-myosin heavy chain
  - One review postulated that these antibodies could predispose some individuals to myocardial injury following COVID-19 vaccination
- Oregon: 40 deaths ages 16-30 yrs after COVID vaccine; 3 within 100 days of vaccination; 2 of these with underlying illness; 1 with undetermined cause of death
  - Assessment of Risk for Sudden Cardiac Death Among Adolescents and Young Adults After Receipt of COVID-19 Vaccine — Oregon, June 2021–December 2022 | MMWR (cdc.gov)

# RSV Vaccine for Adults

- CDC handout: RSV (Respiratory Syncytial Virus) Immunizations | CDC says:
- RSV each year in US: 60,000-160,000 hospitalizations and 6,000-10,000 deaths in adults age ≥65 years ; no real treatment
- Adults ≥75 years: should be given 1 dose of RSV vaccine; 3-year protection
- Adults 60-74 years: any risk factors for severe RSV disease, patient's risk of exposure to RSV, patient's preference for RSV vaccination; nursing home; clinical discretion of HCP if RSV risk high
- Season usually Fall through early Winter

  BUT not always
- UPMC: Pfizer as it can be used in pregnancy
  - Recombinant: Pfizer and GSK (adjuvanted)
  - mRNA: Moderna
  - Most given in pharmacies



# Does RSV Matter to Us?

- UPMC HOSPITALIZED PATIENTS 2015-2019
- 26,211 RV tests, 67.6% were negative.
- Viruses detected in 8,492:
  - Rhinovirus/enterovirus (2552; 30.1%)
    - Unexpectedly Higher Morbidity and Mortality of Hospitalized Elderly Patients Associated with Rhinovirus Compared with Influenza Virus Respiratory Tract Infection (nih.gov)
  - Influenza A (2,299; 27.1%),
  - RSV (1082; 12.7%) in a few years it was worse than flu
  - Human metapneumovirus (832; 9.8%)
  - Parainfluenza (601; 7.1%)
  - Influenza B (565; 6.7%)
  - Non-SARS-CoV-2 coronavirus (420; 4.9% only 1.5 years of data available)
  - Adenovirus (136; 1.6%).
- 60% ≥65 years, 24% 50–64 years, 16% 18–49 years.
- Annual burden: 99–182/100,000 influenza A; 56-81/100,000 RSV.

Population-based hospitalization burden estimates for respiratory viruses, 2015–2019 - PMC (nih.gov)

# Vaccine Updates: HPV Vaccine

- After up to 11.0 (median 10.0) yrs post dose 3, no cases of HPV6/11/16/18/31/33/45/52/58-related high-grade intraepithelial neoplasia or condyloma.
- HPV Vaccine: 2 doses age 9-14 yrs; 1st dose before age 15 yr then only 1 more dose needed at any age; 3 doses if 1st dose after age 14 yrs.; all doses count forever!
- FDA approved through age 45 yrs; CDC: shared clinical decision-making over age 26 yrs. Higher risk: smokers, alcohol, multiple partners, obesity. Others?
- Adult men aged 27 to 45 years are at higher risk
  - Ten-Year Follow-up of 9-Valent Human Papillomavirus Vaccine: Immunogenicity, Effectiveness, and Safety | Pediatrics | American Academy of Pediatrics (aap.org)
  - https://www.ncbi.nlm.nih.gov/pubmed/29182497

# Tdap Vaccine Update: PERTUSSIS WARING

- *New persistent cough: 4-6 weeks: est. 20-50% have pertussis*
- *Outbreaks: e.g., high school in California: 90 cases reported*
- *Asthma link: ?trigger asthma attacks or masquerade as asthma*
- *Complications: rib fracture, stroke, organ failure, encephalitis, death*
- Preliminary data **five times as many cases** (20,791) reported as of week 43 on October 26, 2024 compared to 2023 (PA cases 2,363!)
  - Pertussis Surveillance and Trends | Whooping Cough | CDC
- *High-risk states in order 2023:*

  *Ohio, Utah, South Dakota, Arizona, New York*
- *Tdap FDA: All adults can get Tdap every 8 years but 10 is current*
  - *Use Tdap to give booster every 10 years*
  - *Protection wanes in 5-7 years: need better vaccine*
- *Tdap: 54% adult vaccine rate: HCW are no better!*
- *PREGNANCY: Tdap*

2023 Provisional Pertussis Surveillance Report-March 2024

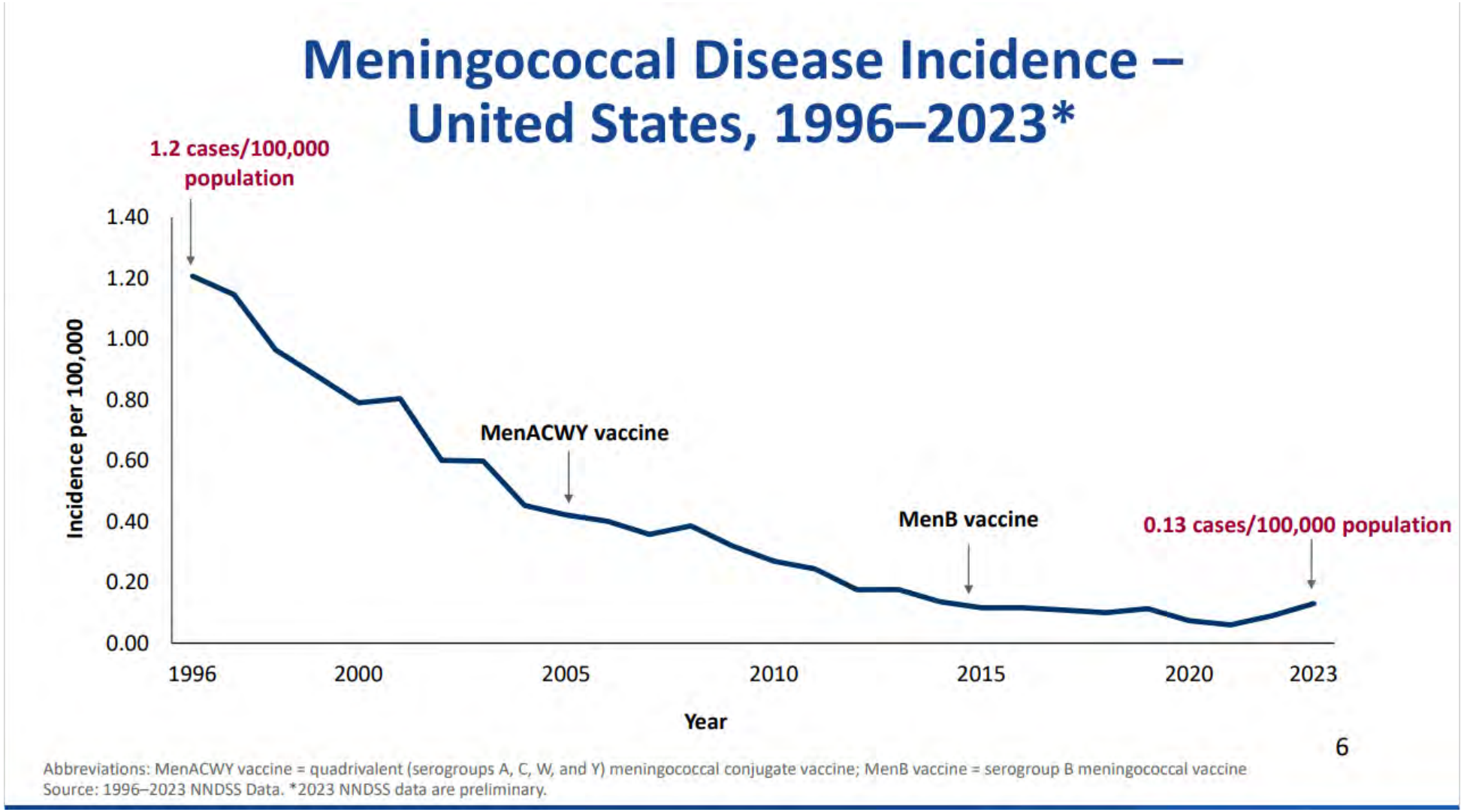
*MMWR*, 2020; 69(39):1391–1397; HUMAN VACCINES & IMMUNOTHERAPEUTICS 2020, VOL. 16, NO. 11, 2609–2617

# Hepatitis B Vaccine Choices

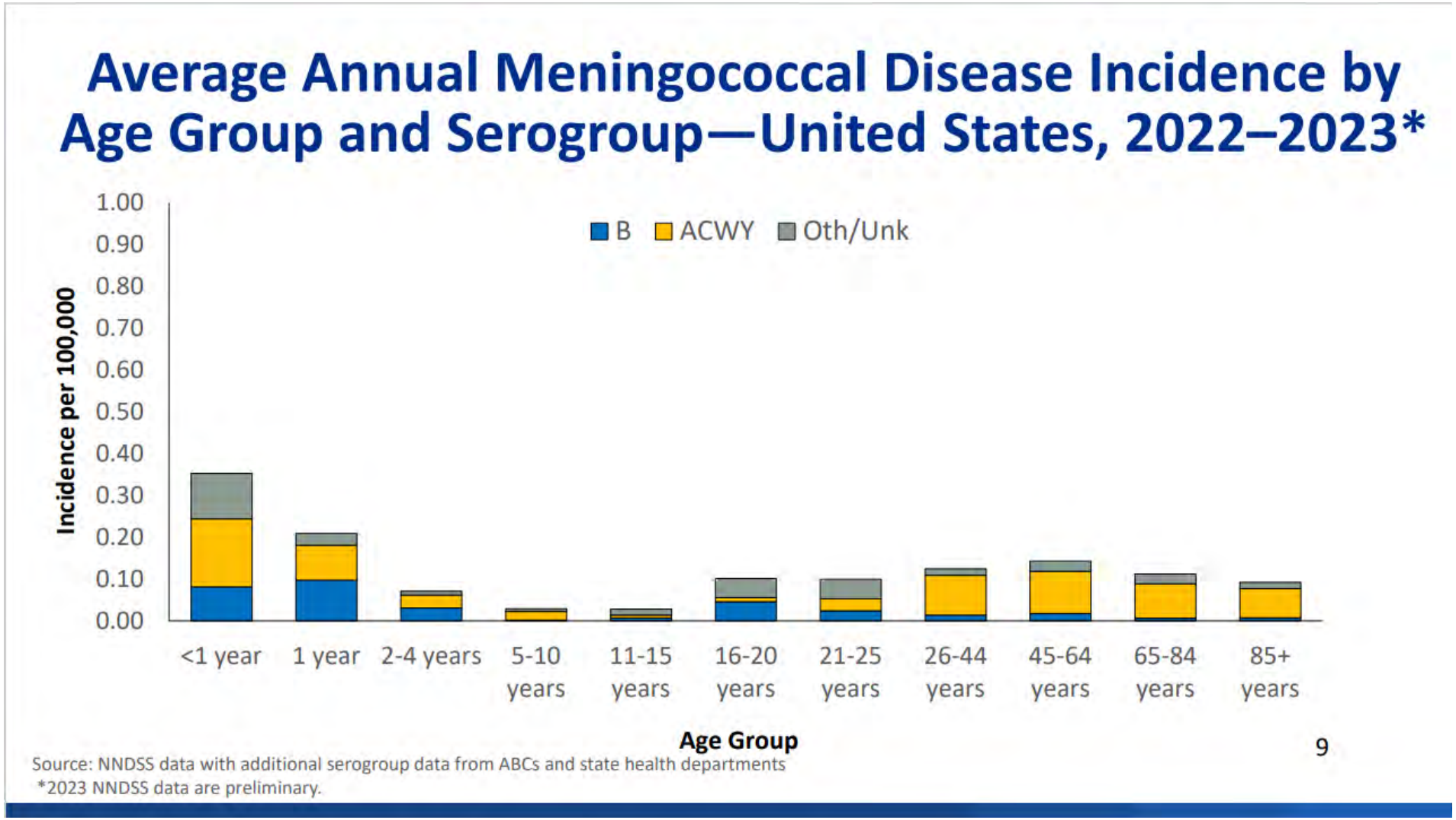
- High risk: drug use, homeless
- All ages:
  - Engerix B: 3 doses at 0, 1-2, 6 mos
  - Recombivax HB: 3 doses at 0, 1-2, 6 mos
- Adults: universal vaccination age 19-59; age 60 and over with risk factors (4/1/22)
  - Above 2 choices
  - Heplisav-B: 2 doses at 0, 1 mo; more expensive; better immune response
  - Twinrix: 3 doses at 0, 1, 6 mos (to get hepatitis A, coverage use all Twinrix)
  - PreHevbrio: 3 doses at 0, 1, 6 mos; 3 surface targets on HepB

2024 Viral Hepatitis National Progress Report | CDC;
Universal Hepatitis B Vaccination in Adults Aged 19–59 Years: Updated Recommendations of the Advisory Committee on Immunization Practices — United States, 2022 | MMWR (cdc.gov)

# Meningococcus



# Meningococcus: When to Vaccinate with What?

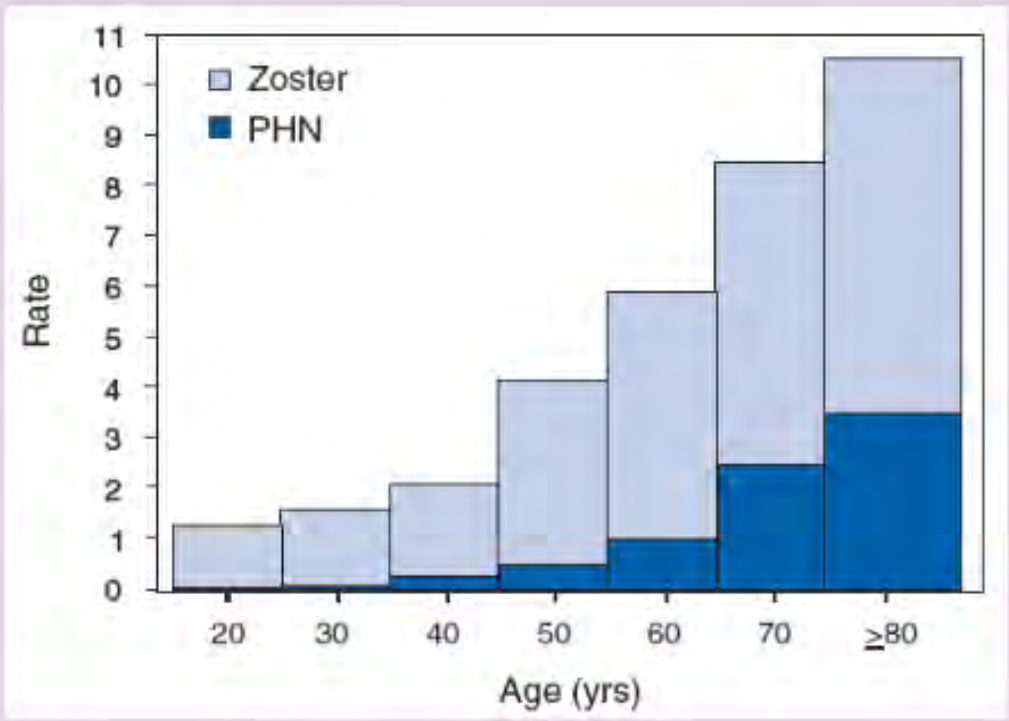



New: Penbraya pentavalent, Pfizer. GSK pentavalent coming. ACIP vote on use in Feb 2025

# Hanging Out Your Shingles

Age 50 yrs and up and age ≥18 yrs who are or will be at increased risk of HZ due to immunodeficiency or immunosuppression caused by known disease or therapy.

# Shingles and Postherpetic Neuralgia by Age




View Larger

*per 1,000 person-years.

† Defined as pain for 30 days or longer

Source:
https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5705a1.htm

Zostavax:

2 doses, 2-6 mos apart

# PREGNANCY

- Pregnancy and Vaccination | Pregnancy & Vaccines | CDC
  - Tdap: 27 to 36 weeks: *with only 56% uptake got 78% effect in risk reduction for infants! V*accinate family members (& us!)
  - RSV: 32 to 36 weeks
  - Flu: any time but… maybe best in third trimester in late Summer/early Fall; second trimester early Fall to protect newborn
  - COVID: any time but… maybe better in third trimester to protect newborn
  - Maybe: hepatitis B (non-immune), hepatitis A (liver disease), travel vaccines
  - All routine vaccines but especially HPV before or after pregnancy
  - Coming soon: GBS vaccine to prevent fetal loss, premature delivery, and GBS sepsis (perhaps late infection)
  - MMR, varicella best before or after pregnancy BUT testing for pregnancy prior to administration not indicated. No major reported complications to date.

# TRAVELERS HELP

- Destinations | Travelers' Health | CDC
  - Call CDC-INFO (1-800-232-4636)
  - Email CDC-INFO

Laos


On This Page

Travel Health Notices

Vaccines and Medicines

Non-Vaccine-Preventable Diseases

Stay Healthy and Safe

Packing List

After Your Trip

# New and A Few on the Horizon

- Malaria
- Tuberculosis: number one infectious disease killer in the world!
- Tick-borne encephalitis
- Japanese encephalitis
- Dengue
- Chikungunya: Valneva +
- Lyme vaccine: Pfizer + Valneva
- hMPV: Moderna
- CMV: several (hearing loss)
- Influenza: mRNA
- E. coli
- Staphylococcus (maybe?)
- Clostridioides difficile: mRNA

Immunization, Vaccines and Biologicals (who.int)

# HCPs Responsibility for Reporting Vaccine Adverse Events

HCPS are required by law to report to VAERS:

- Any adverse event listed in the *VAERS Table of Reportable Events Following Vaccination* that occurs within the specified time period after vaccination
- An adverse event listed by the vaccine manufacturer as a contraindication to further doses of the vaccine

HCPs are strongly encouraged to report:

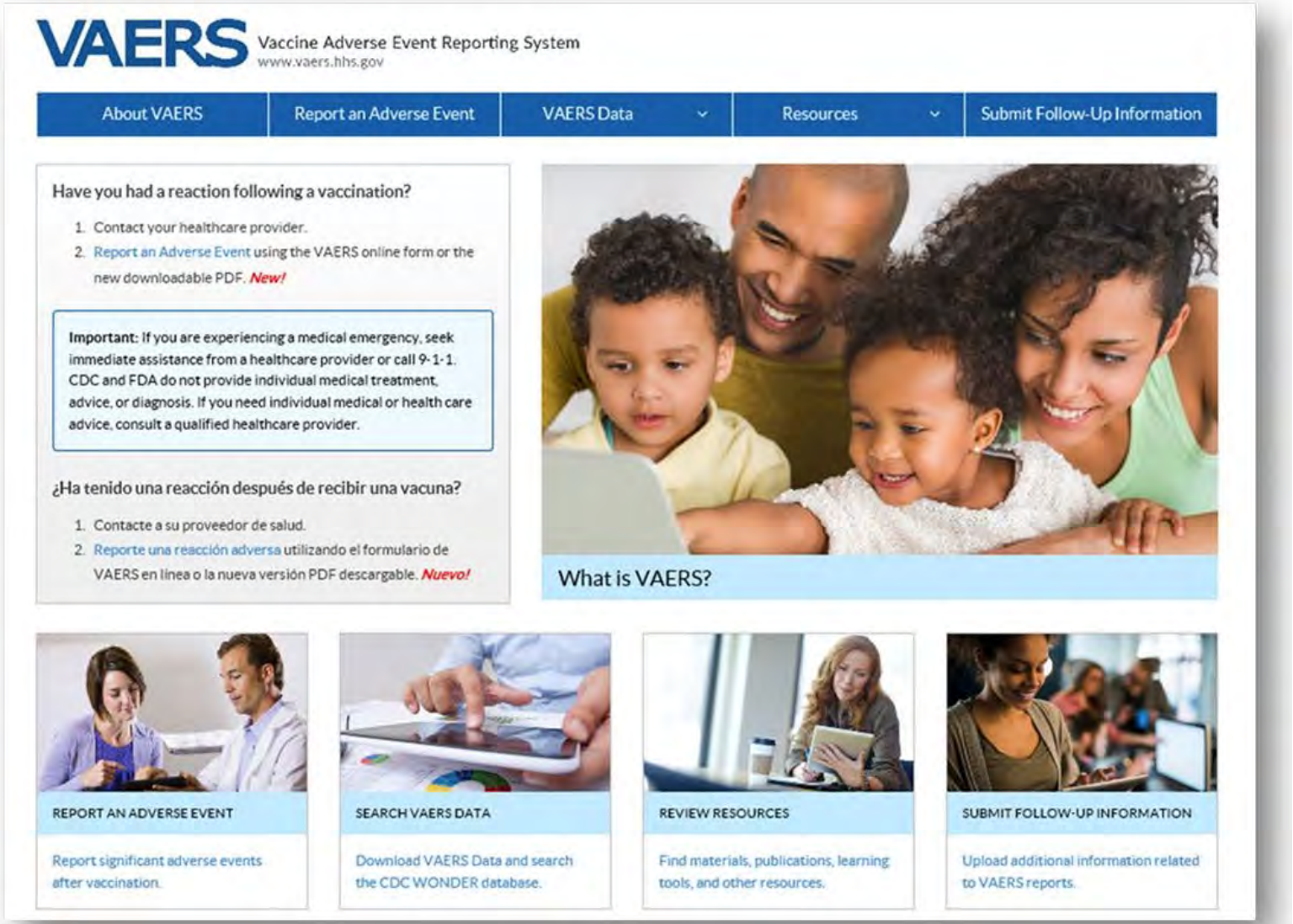
- Any adverse event that occurs after the administration of a vaccine licensed in the United States, whether or not it is clear that a vaccine caused the adverse event
- Vaccine administration errors

https://vaers.hhs.gov/faq.html

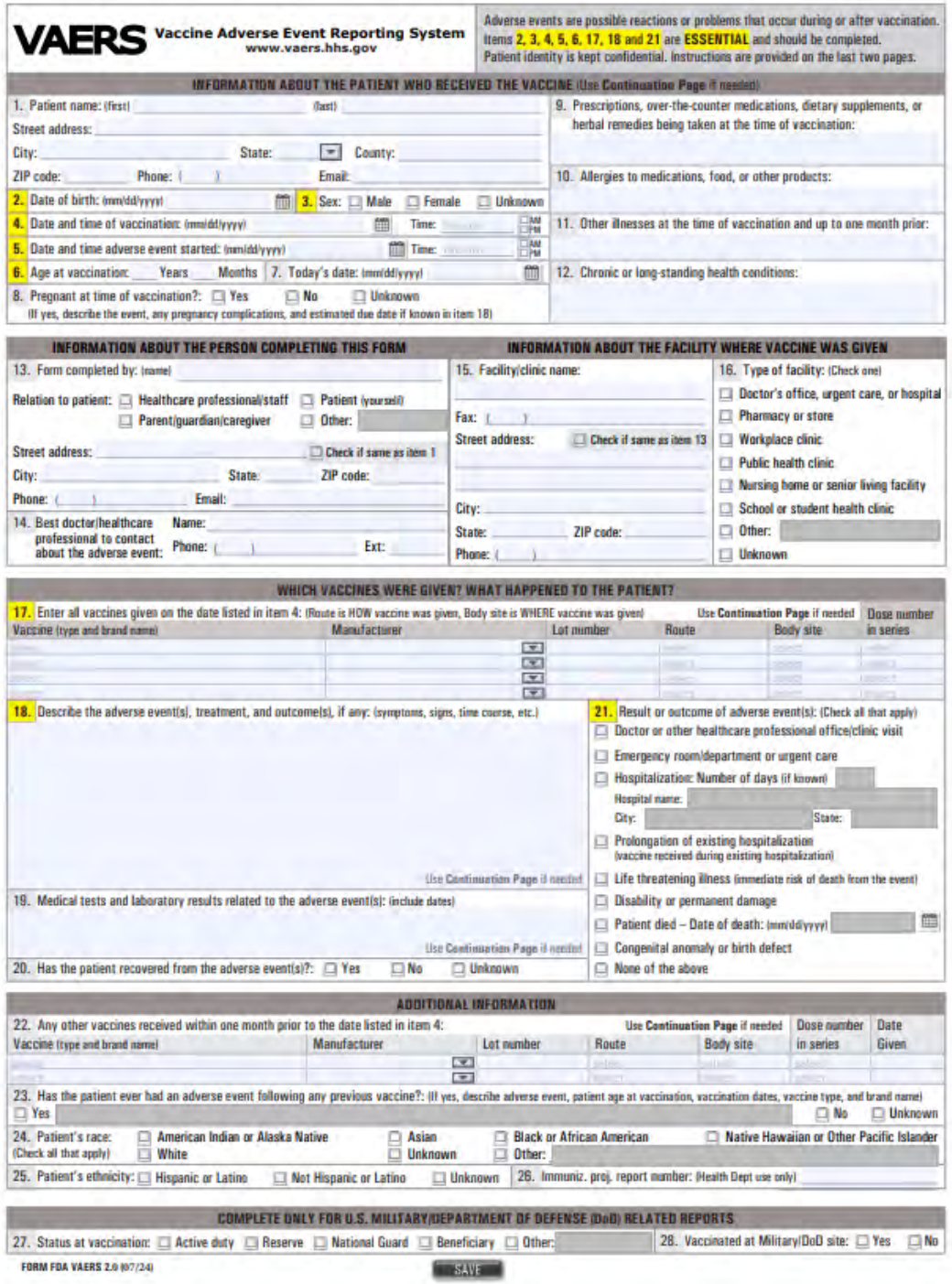
# VAERS

## Vaccine Adverse Event Reporting System

Co-Managed by CDC and FDA




http://vaers.hhs.gov



VAERS Vaccine Adverse Event Reporting System
www.vaers.hhs.gov

Adverse events are possible reactions or problems that occur during or after vaccination. Items 2, 3, 4, 5, 6, 17, 18 and 21 are ESSENTIAL and should be completed. Patient identity is kept confidential. Instructions are provided on the last two pages.

INFORMATION ABOUT THE PATIENT WHO RECEIVED THE VACCINE (Use Continuation Page if needed)

1. Patient name: (first) (last)
Street address:
City: State: County:
ZIP code: Phone: ( ) Email:
2. Date of birth: (mm/dd/yyyy) 3. Sex: Male Female Unknown
4. Date and time of vaccination: (mm/dd/yyyy) Time: AM PM
5. Date and time adverse event started: (mm/dd/yyyy) Time: AM PM
6. Age at vaccination: Years Months 7. Today's date: (mm/dd/yyyy)
8. Pregnant at time of vaccination?: Yes No Unknown
(If yes, describe the event, any pregnancy complications, and estimated due date if known in item 18)

9. Prescriptions, over-the-counter medications, dietary supplements, or herbal remedies being taken at the time of vaccination:
10. Allergies to medications, food, or other products:
11. Other illnesses at the time of vaccination and up to one month prior:
12. Chronic or long-standing health conditions:

INFORMATION ABOUT THE PERSON COMPLETING THIS FORM

13. Form completed by: (name)
Relation to patient: Healthcare professional/staff Patient (yourself) Parent/guardian/caregiver Other:
Street address: Check if same as item 1
City: State: ZIP code:
Phone: ( ) Email:
14. Best doctor/healthcare professional to contact about the adverse event: Name:
Phone: ( ) Ext:

INFORMATION ABOUT THE FACILITY WHERE VACCINE WAS GIVEN

15. Facility/clinic name:
Fax: ( )
Street address: Check if same as item 13
City:
State: ZIP code:
Phone: ( )

16. Type of facility: (Check one)
Doctor's office, urgent care, or hospital
Pharmacy or store
Workplace clinic
Public health clinic
Nursing home or senior living facility
School or student health clinic
Other:
Unknown

WHICH VACCINES WERE GIVEN? WHAT HAPPENED TO THE PATIENT?

17. Enter all vaccines given on the date listed in item 4: (Route is HOW vaccine was given, Body site is WHERE vaccine was given) Use Continuation Page if needed

| Vaccine (type and brand name) | Manufacturer | Lot number | Route | Body site | Dose number in series |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

18. Describe the adverse event(s), treatment, and outcome(s), if any: (symptoms, signs, time course, etc.)
Use Continuation Page if needed

19. Medical tests and laboratory results related to the adverse event(s): (include dates)
Use Continuation Page if needed

20. Has the patient recovered from the adverse event(s)?: Yes No Unknown

21. Result or outcome of adverse event(s): (Check all that apply)
Doctor or other healthcare professional office/clinic visit
Emergency room/department or urgent care
Hospitalization: Number of days (if known)
Hospital name:
City: State:
Prolongation of existing hospitalization (vaccine received during existing hospitalization)
Life threatening illness (immediate risk of death from the event)
Disability or permanent damage
Patient died – Date of death: (mm/dd/yyyy)
Congenital anomaly or birth defect
None of the above

ADDITIONAL INFORMATION

22. Any other vaccines received within one month prior to the date listed in item 4: Use Continuation Page if needed

| Vaccine (type and brand name) | Manufacturer | Lot number | Route | Body site | Dose number in series | Date Given |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |

23. Has the patient ever had an adverse event following any previous vaccine?: (If yes, describe adverse event, patient age at vaccination, vaccination dates, vaccine type, and brand name)
Yes No Unknown

24. Patient's race: (Check all that apply) American Indian or Alaska Native Asian Black or African American Native Hawaiian or Other Pacific Islander White Unknown Other:

25. Patient's ethnicity: Hispanic or Latino Not Hispanic or Latino Unknown

26. Immuniz. proj. report number: (Health Dept use only)

COMPLETE ONLY FOR U.S. MILITARY/DEPARTMENT OF DEFENSE (DoD) RELATED REPORTS

27. Status at vaccination: Active duty Reserve National Guard Beneficiary Other:

28. Vaccinated at Military/DoD site: Yes No

FORM FDA VAERS 2.0 (07/24)

SAVE

RETURN TO PAGE 1

## COMPLETING THE VACCINE ADVERSE EVENT REPORTING SYSTEM (VAERS) FORM

### GENERAL INSTRUCTIONS

- Submit this form electronically using the Internet. For instructions, visit www.vaers.hhs.gov/uploadfile/.
- If you are unable to submit this form electronically, you may fax it to VAERS at 1-877-721-0366.
- If you need additional help submitting a report you may call the VAERS toll-free information line at 1-800-822-7967, or send an email to info@vaers.org.
- Fill out the VAERS form as completely as possible and use the **Continuation Page** if needed. Use a separate VAERS form for each individual patient.
- If you do not know exact numbers, dates, or times, please provide your best guess. You may leave these spaces blank if you are not comfortable guessing.
- You can get specific information on the vaccine and vaccine lot number by contacting the facility or clinic where the vaccine was administered.
- Please report all significant adverse events that occur after vaccination of adults and children, even if you are not sure whether the vaccine caused the adverse event.
- Healthcare professionals should refer to the VAERS Table of Reportable Events at www.vaers.hhs.gov/reportable.html for the list of adverse events that must be reported by law (42 USC 300aa-25).
- Healthcare professionals treating a patient for a suspected vaccine adverse event may need to contact the person who administered the vaccine in order to exchange information and decide how best to complete and submit the VAERS form.

### SPECIFIC INSTRUCTIONS

**Items 2, 3, 4, 5, 6, 17, 18 and 21** are **ESSENTIAL** and should be completed.

- **Items 4 and 5:** Provide dates and times as specifically as you can and enter as much information as possible (e.g., enter the month and year even if you don't know the day). If you do not know the exact time, but know it was in the morning ("AM") or afternoon or evening ("PM"), please provide that information.
- **Item 6:** If you fill in the form by hand, provide age in years. If a child is less than 1 year old, provide months of age. If a child is more than 1 year old but less than 2 years old, provide year and months (e.g., 1 year and 6 months). If a child is less than 1 month of age when vaccinated (e.g., a birth dose of hepatitis B vaccine) then answer 0 years and 0 months, but be sure to include the patient's date of birth (item 2) and date and time of vaccination (item 4).
- **Item 8:** If the patient who received the vaccine was pregnant at time of vaccination, select "Yes" and describe the event, any pregnancy complications, and estimated due date if known in item 18. Otherwise, select "No" or "Unknown."
- **Item 9:** List any prescriptions, over-the-counter medications, dietary supplements, herbal remedies, or other non-traditional/alternative medicines being taken by the patient when the vaccine(s) was given.
- **Item 10:** List any allergies the patient has to medications, foods, or other products.
- **Item 11:** List any short-term or acute illnesses the patient had on the date of vaccination AND up to one month prior to this date (e.g., cold, stomach flu, ear infection, etc.). This does **NOT** include the adverse event you are reporting.
- **Item 12:** List any chronic or long-standing health conditions the patient has (e.g., asthma, diabetes, heart disease).
- **Item 13:** List the name of the person who is completing the form. Select the "Check if same as item 1" box if you are the patient or if you live at the same address as the patient. The contact information you provided in item 1 will be automatically entered for you. Otherwise, please provide new contact information.
- **Item 14:** List the doctor or other healthcare professional who is the best person to contact to discuss the clinical details of the adverse event.
- **Item 15:** Select the "Check if same as item 13" box if the person completing the form works at the facility that administered the vaccine(s). The contact information provided in item 13 will be automatically entered for you. Otherwise, provide new contact information.
- **Item 16:** Select the option that best describes the type of facility where the vaccine(s) was given.

# Thank You!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REG U.S.
PAT. OFF.
That's All Folks!
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