RBC Cardinal Health

DENVER

JULY 9-12, 2025

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Boost Your Knowledge: 2025 Immunization Updates

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RBC Cardinal Health DENVER JULY 9-12, 2025

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Disclosure Statement

Jean-Venable R. has/has a financial interest with Pfizer and Valneva and the relationship has been mitigated through peer review of this presentation. There are no relevant financial relationships with ACPE defined commercial interests for anyone else in control of the content of the activity.

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Pharmacist and Technician Learning Objectives

1. Review recent ACIP recommendation changes from July 2024 through June 2025.
2. Apply recent updates to ACIP vaccine schedules and recommendations to pharmacy practice.
3. Discuss the latest updates regarding the measles outbreak and MMR vaccines.

Assessment Question #1

A 40 year old kidney transplant patient on immunosuppressive therapy presents to the pharmacy for an influenza vaccine. Which of the following is an appropriate influenza vaccine?

A. HD-II3
B. LAIV3
C. RIV3
D. IIV4

Assessment Question #2

RSV vaccine is recommended for which of the following patients?

A. 55 year old patient with no chronic conditions
B. 59 year old patient with hypertension
C. 60 year old patient with congestive heart failure
D. 65 year old patient with no chronic conditions

Assessment Question #3

What is the recommended COVID-19 vaccine composition for 2025-2026?

A. Monovalent XBB.1.5
B. Monovalent JN.1
C. Bivalent XBB.1.5 and JN.1
D. Bivalent BA.5 and JN.1

Assessment Question #4

PCV vaccine is recommended for which of the following persons?

A. 25 year old with a history of pneumonia
B. 40 year old man with hypertension
C. 45 year old woman without any chronic conditions
D. 55 year old man without any chronic conditions

Overview

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Flawed ACIP Process Leads to Confusion and Distrust

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DATE

June 27, 2025

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Presentation Outline

- Vaccine Coverage and Outbreaks
- Vaccine Schedules
- Vaccines with Recommendations
- Summary

Vaccine Coverage and Vaccine Preventable Disease Outbreaks

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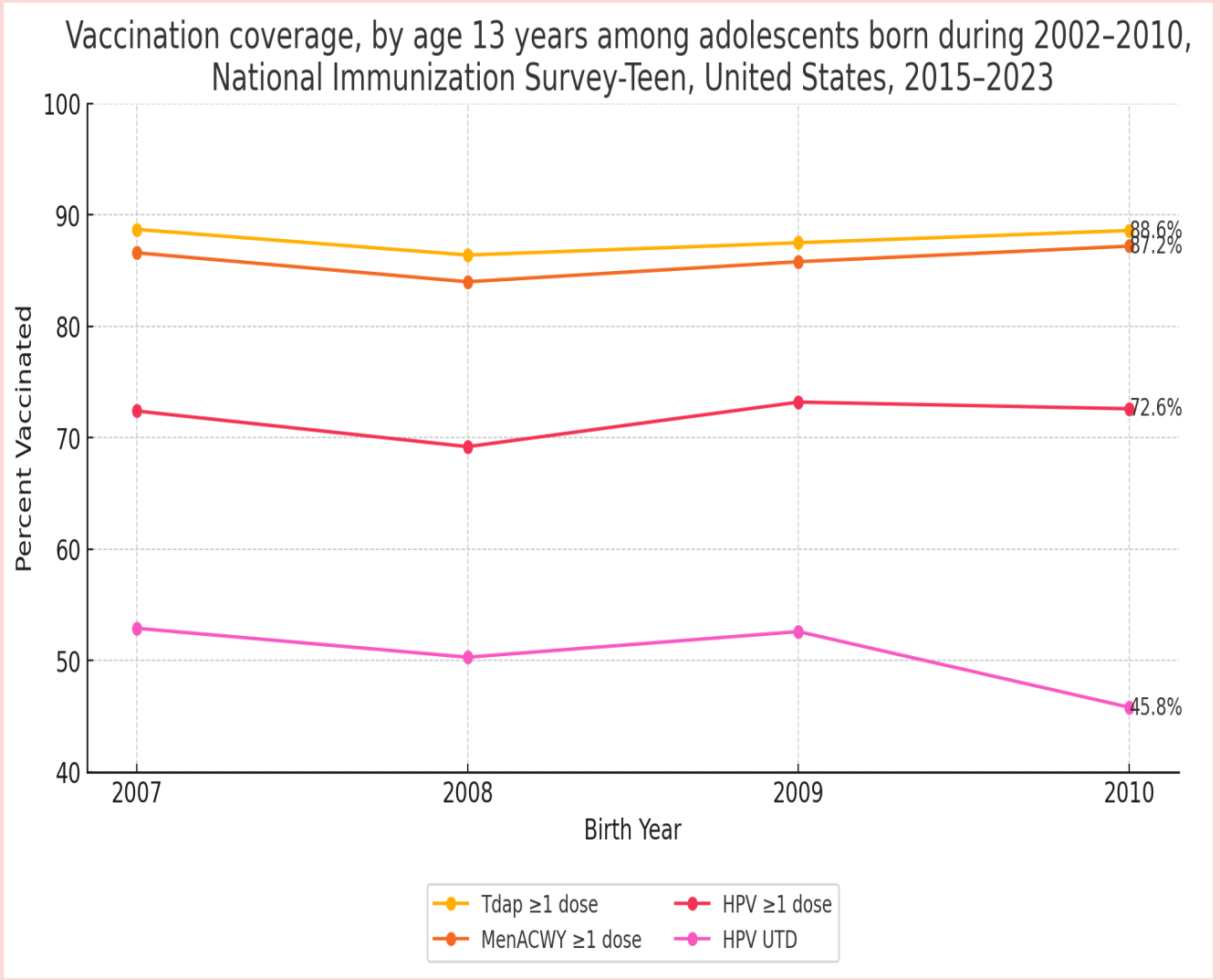
Child and Adolescent Vaccine Coverage 2024

- Coverage for vaccines by age 24 months declined
  - Hepatitis A and 2-doses of influenza lowest
  - Polio, MMR, and 3-doses of Hepatitis B remained >90%
- Coverage for all reported vaccines decreased to less than 93% at Kindergarten entry
  - Exemption rate increased to 3.3%

Hill HA, et al. *MMWR* 2024;844-853
Seither R. et al, *MMWR* 2024;73:925-922



MMWR Weekly / August 22, 2024 / 73(33);708–714

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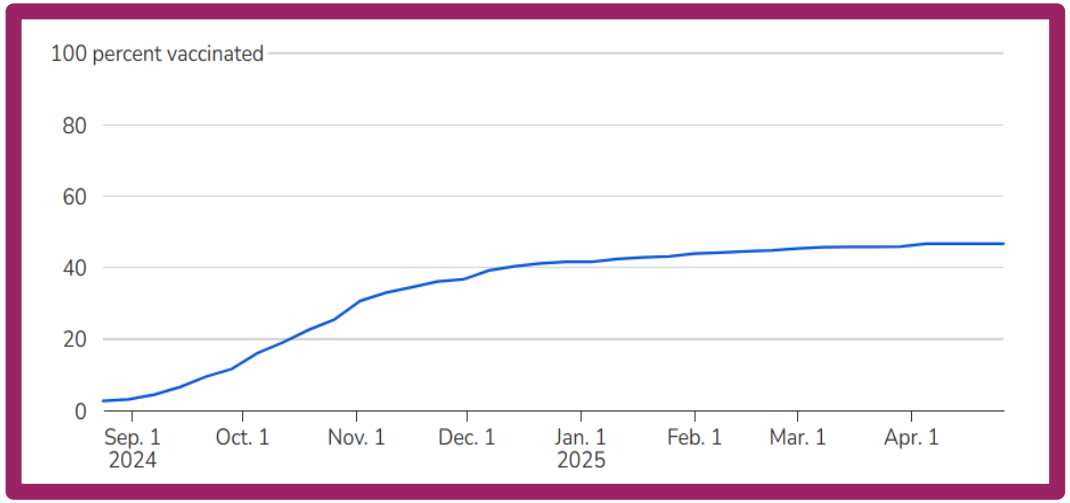
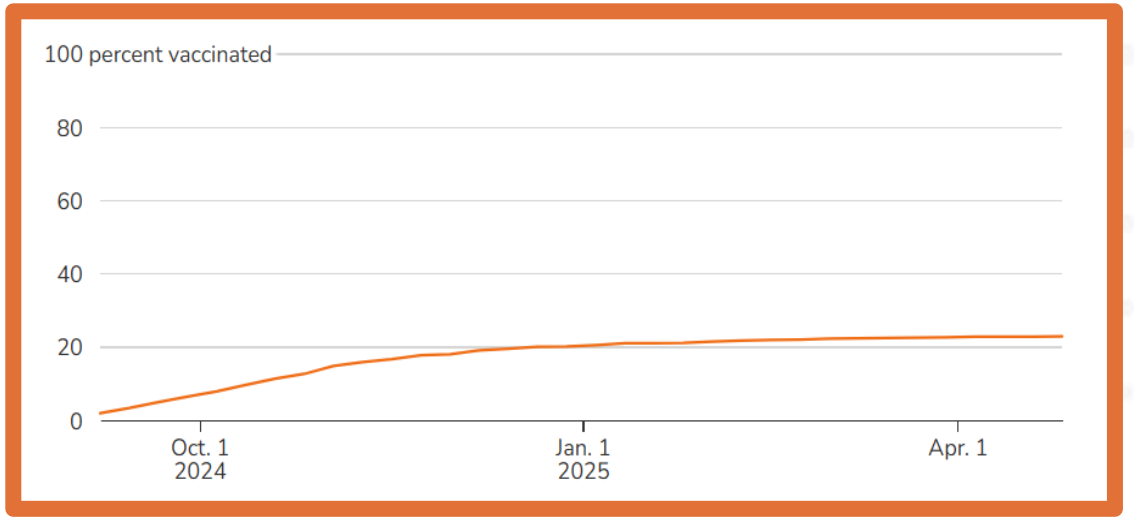
Adult Respiratory Vaccine Coverage

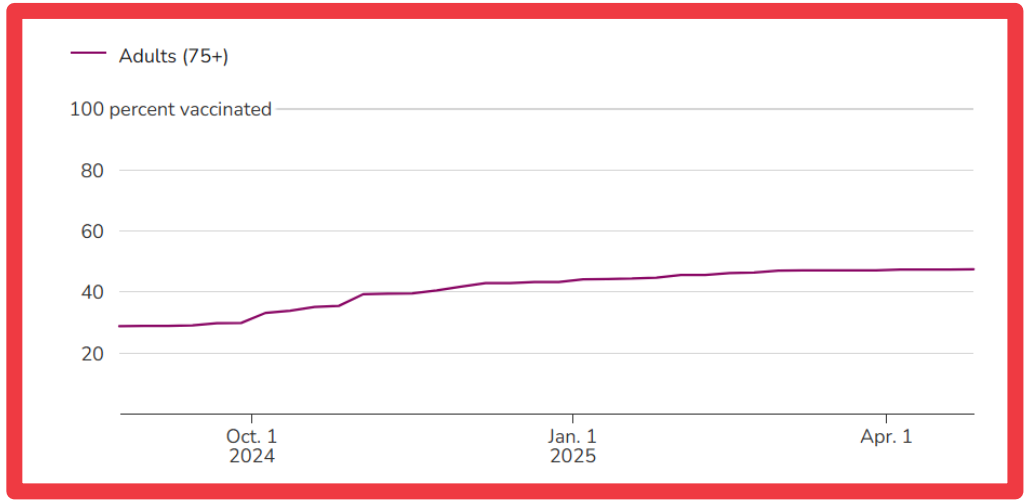
Influenza



COVID-19



RSV



https://www.cdc.gov/respiratory-viruses/data/vaccination-trends.html

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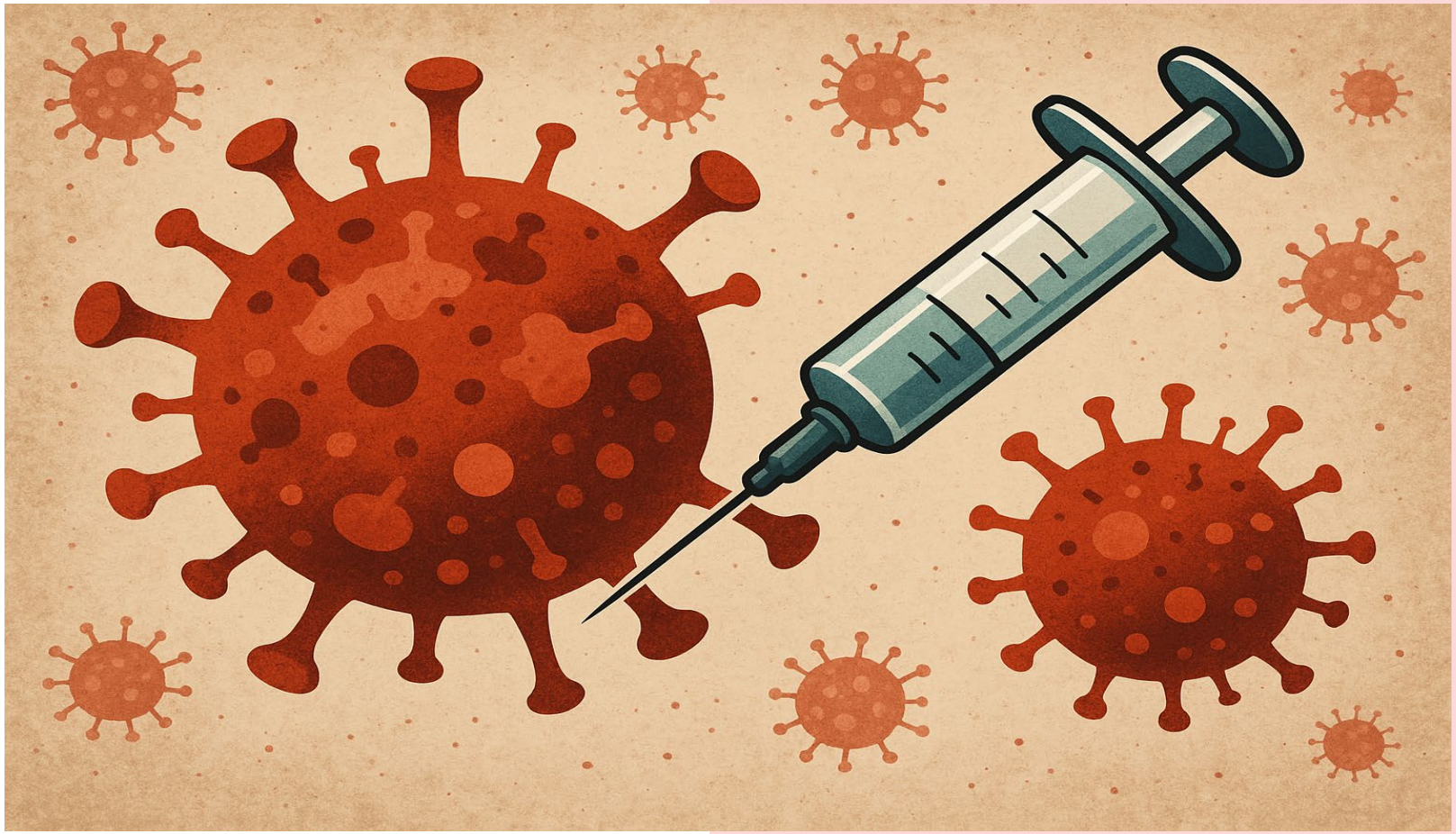
Measles



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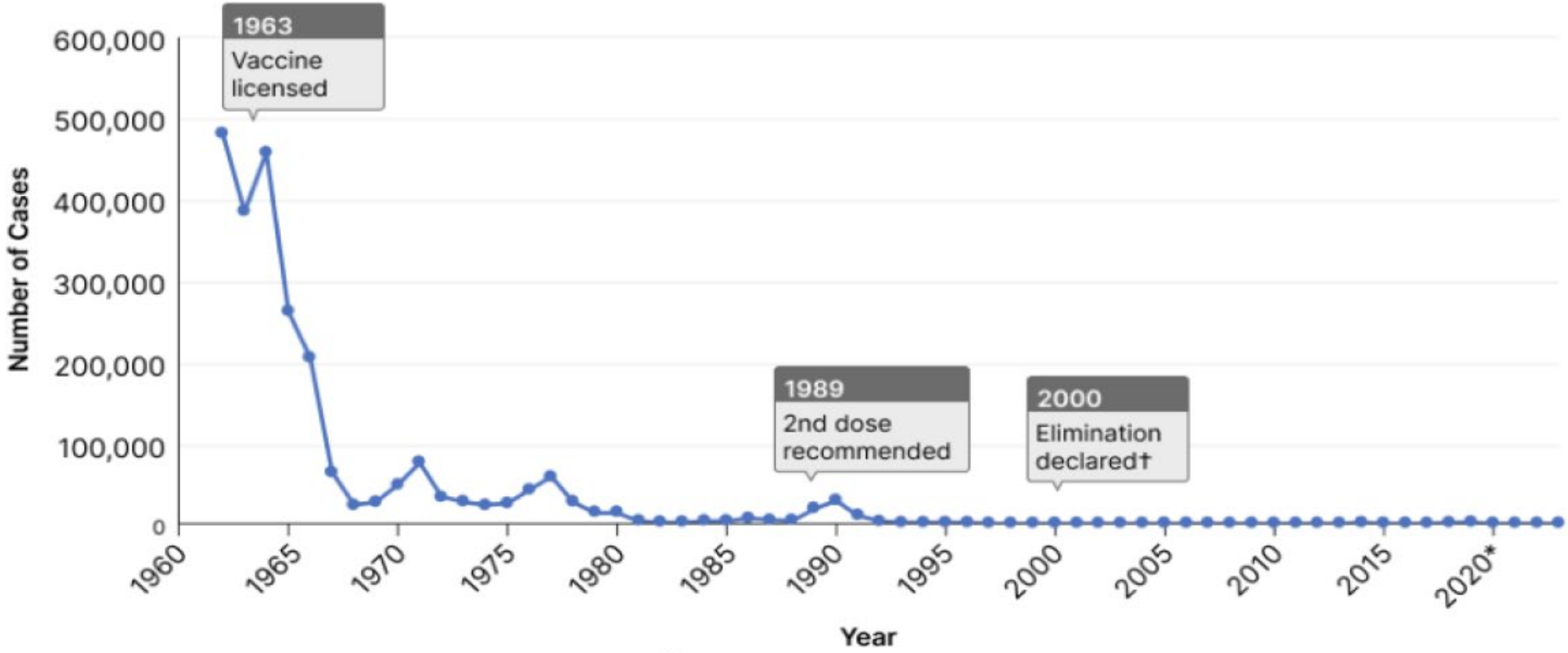
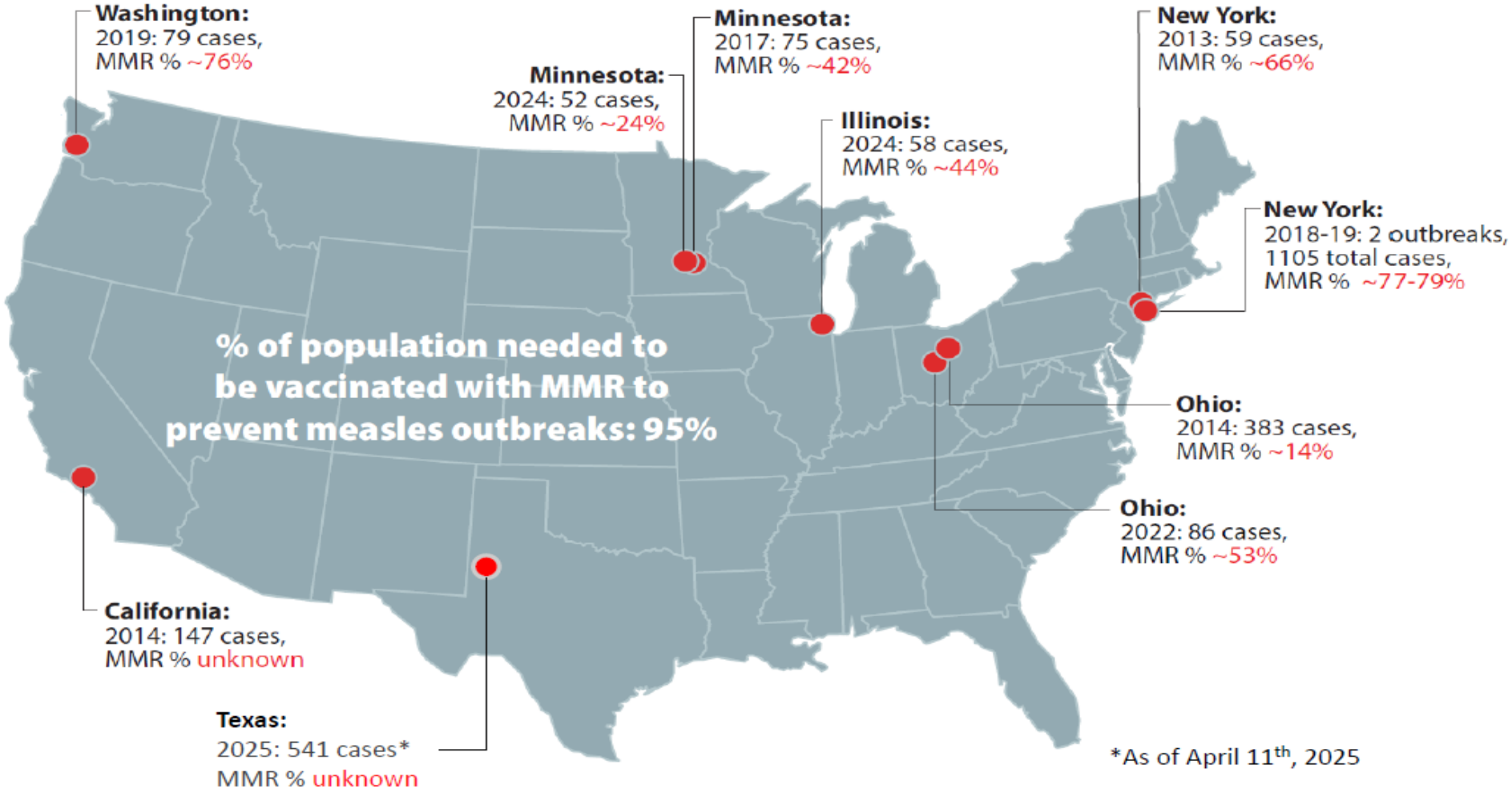
History of Measles Cases in the US, 1962 - 2023



†Measles was declared eliminated in the U.S. in 2000 by WHO/PAHO. Elimination is defined as the absence of endemic measles transmission in a region for ≥ 12 months in the presence of a well-performing surveillance system

Sugerman. ACIP Meeting. April 2025.

Measles Outbreaks (50+ cases)/MMR Coverage 2001-2025



Sugerman. ACIP Meeting. April 2025.

Epidemiology of Measles Cases

- **Age**
  - Under 5 years: 355 (29%)
  - 5-19 years: 455 (37%)
  - 20+ years: 404 (33%)
  - Age unknown: 13 (1%)
- **Vaccination Status**
  - Unvaccinated or Unknown: 95%
  - One MMR dose: 2%
  - Two MMR doses: 3%
- **Hospitalizations**
  - 12% of cases (148 of 1227) for management of measles complications
  - Deaths - 2 in Texas and 1 in New Mexico

Suhttps://www.cdc.gov/measles/data-research/index.html.

Review of Evidence for Measles Immunity

- Written documentation of adequate vaccination
  - one or more doses of a measles-containing vaccine administered on or after the first birthday for preschool-age children and adults not at high risk
  - two doses of measles-containing vaccine for school-age children, adolescents, and adults at high risk, including college students, healthcare personnel, and international travelers
- Laboratory evidence of immunity
- Laboratory confirmation of measles (verbal history of measles does not count)
- Birth before 1957

ACIP Recommendation – Measles Vaccine

- One dose of MMR vaccine
  - Adults born in 1957 or later who are at low risk (e.g., not an international traveler, healthcare worker, or person attending college or other post-high school educational institution) and have no documented vaccination with live measles vaccine and no laboratory evidence of immunity or prior measles infection
- Two doses of MMR vaccine
  - High-risk adults without any prior documented live measles vaccination and no laboratory evidence of immunity or prior measles infection, including:
    - healthcare personnel
    - international travelers born in 1957 or later
    - people attending colleges and other post-high school educational institutions

Vaccine Schedules

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Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger

UNITED STATES 2025

Vaccines and Other Immunizing Agents in the Child and Adolescent Immunization Schedule*

Monoclonal antibody	Abbreviation(s)	Trade name(s)
Respiratory syncytial virus monoclonal antibody (Nirsevimab)	RSV-mAb	Beyfortus
Vaccine	**Abbreviation(s)**	**Trade name(s)**
COVID-19 vaccine	1vCOV-mRNA	Comirnaty/Pfizer-BioNTech COVID-19 Vaccine Spikevax/Moderna COVID-19 Vaccine
	1vCOV-aPS	Novavax COVID-19 Vaccine
Dengue vaccine	DEN4CYD	Dengvaxia
Diphtheria, tetanus, and acellular pertussis vaccine	DTaP	Daptacel Infanrix
Haemophilus influenzae type b vaccine	Hib (PRP-T)	ActHIB Hiberix PedvaxHIB
	Hib (PRP-OMP)	
Hepatitis A vaccine	HepA	Havrix Vaqta
Hepatitis B vaccine	HepB	Engerix-B Recombivax HB
Human papillomavirus vaccine	HPV	Gardasil 9
Influenza vaccine (inactivated; egg-based)	IIV3	Multiple
Influenza vaccine (inactivated; cell-culture)	ccIIV3	Flucelvax
Influenza vaccine (live, attenuated)	LAIV3	FluMist
Measles, mumps, and rubella vaccine	MMR	M-M-R II Priorix
Meningococcal serogroups A, C, W, Y vaccine	MenACWY-CRM	Menveo
	MenACWY-TT	MenQuadfi
Meningococcal serogroup B vaccine	MenB-4C	Bexsero
	MenB-FHbp	Trumenba
Meningococcal serogroup A, B, C, W, Y vaccine	MenACWY-TT/ MenB-FHbp	Penbraya
Mpox vaccine	Mpox	Jynneos
Pneumococcal conjugate vaccine	PCV15	Vaxneuvance
	PCV20	Prevnar 20
Pneumococcal polysaccharide vaccine	PPSV23	Pneumovax 23
Poliovirus vaccine (inactivated)	IPV	Ipol
Respiratory syncytial virus vaccine	RSV	Abrysvo
Rotavirus vaccine	RV1	Rotarix
	RV5	RotaTeq
Tetanus, diphtheria, and acellular pertussis vaccine	Tdap	Adacel Boostrix
Tetanus and diphtheria vaccine	Td	Tenivac Tdvax
Varicella vaccine	VAR	Varivax
Combination vaccines (use combination vaccines instead of separate injections when possible)		
DTaP, hepatitis B, and inactivated poliovirus vaccine	DTaP-HepB-IPV	Pediarix
DTaP, inactivated poliovirus, and *Haemophilus influenzae* type b vaccine	DTaP-IPV/Hib	Pentacel
DTaP and inactivated poliovirus vaccine	DTaP-IPV	Kinrix Quadracel
DTaP, inactivated poliovirus, *Haemophilus influenzae* type b, and hepatitis B vaccine	DTaP-IPV-Hib-HepB	Vaxelis
Measles, mumps, rubella, and varicella vaccine	MMRV	ProQuad

*Administer recommended vaccines if immunization history is incomplete or unknown. Do not restart or add doses to vaccine series for extended intervals between doses. When a vaccine is not administered at the recommended age, administer at a subsequent visit. The use of trade names is for identification purposes only and does not imply endorsement by the ACIP or CDC.

Revised 05/28/2025

How to use the child and adolescent immunization schedule

1. Determine recommended vaccine by age **(Table 1)**
2. Determine recommended interval for catch-up vaccination **(Table 2)**
3. Assess need for additional recommended vaccines by medical condition or other indication **(Table 3)**
4. Review vaccine types, frequencies, intervals, and considerations for special situations **(Notes)**
5. Review contraindications and precautions for vaccine types **(Appendix)**

Report

- Suspected cases of reportable vaccine-preventable diseases or outbreaks to your state or local health department
- Clinically significant adverse events to the Vaccine Adverse Event Reporting System (VAERS) at www.vaers.hhs.gov or 800-822-7967

Questions or comments

Contact www.cdc.gov/cdc-info or 800-CDC-INFO (800-232-4636), in English or Spanish, 8 a.m.–8 p.m. ET, Monday through Friday, excluding holidays.

Download the CDC Vaccine Schedules app for providers at www.cdc.gov/vaccines/hcp/imz-schedules/app.html

Helpful information

- Complete Advisory Committee on Immunization Practices (ACIP) recommendations: www.cdc.gov/acip-recs/hcp/vaccine-specific/index.html
- ACIP Shared Clinical Decision-Making Recommendations: www.cdc.gov/acip/vaccine-recommendations/shared-clinical-decision-making.html
- *General Best Practice Guidelines for Immunization* (including contraindications and precautions): www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html
- Vaccine information statements: www.cdc.gov/vaccines/hcp/vis/index.html
- Manual for the Surveillance of Vaccine-Preventable Diseases (including case identification and outbreak response): www.cdc.gov/surv-manual/php/

U.S. CENTERS FOR DISEASE CONTROL AND PREVENTION

Scan QR code for access to online schedule

CS310820-E

Recommended Adult Immunization Schedule
for ages 19 years or older

UNITED STATES 2025

Vaccines in the Adult Immunization Schedule*

Vaccine	Abbreviation(s)	Trade name(s)
COVID-19 vaccine	1vCOV-mRNA	Comirnaty/Pfizer-BioNTech COVID-19 Vaccine Spikevax/Moderna COVID-19 Vaccine
	1vCOV-aPS	Novavax COVID-19 Vaccine
Haemophilus influenzae type b vaccine	Hib	ActHIB, Hiberix, PedvaxHIB
Hepatitis A vaccine	HepA	Havrix, Vaqta
Hepatitis A and hepatitis B vaccine	HepA-HepB	Twinrix
Hepatitis B vaccine	HepB	Engerix-B, Heplisav-B, PreHevbrio, Recombivax HB
Human papillomavirus vaccine	HPV	Gardasil 9
Influenza vaccine (inactivated, egg-based)	IIV3	Multiple
	aIIV3	Fluad
	HD-IIV3	Fluzone High-Dose
Influenza vaccine (inactivated, cell-culture)	ccIIV3	Flucelvax
Influenza vaccine (recombinant)	RIV3	Flublok
Influenza vaccine (live, attenuated)	LAIV3	FluMist
Measles, mumps, and rubella vaccine	MMR	M-M-R II, Priorix
Meningococcal serogroups A, C, W, Y vaccine	MenACWY-CRM	Menveo
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	MenB-FHbp	Trumenba
Meningococcal serogroup A, B, C, W, Y vaccine	MenACWY-TT/ MenB-FHbp	Penbraya
Mpox vaccine	Mpox	Jynneos
Pneumococcal conjugate vaccine	PCV15	Vaxneuvance
	PCV20	Prevnar 20
	PCV21	Capvaxive
Pneumococcal polysaccharide vaccine	PPSV23	Pneumovax 23
Poliovirus vaccine (inactivated)	IPV	Ipol
Respiratory syncytial virus vaccine	RSV	Abrysvo, Arexvy, mResvia
Tetanus and diphtheria vaccine	Td	Tenivac
Tetanus, diphtheria, and acellular pertussis vaccine	Tdap	Adacel, Boostrix
Varicella vaccine	VAR	Varivax
Zoster vaccine, recombinant	RZV	Shingrix

*Administer recommended vaccines if vaccination history is incomplete or unknown.
Do not restart or add doses to vaccine series if there are extended intervals between doses.
The use of trade names is for identification purposes only and does not imply endorsement by the ACIP or CDC.

Reviewed 05/28/2025

How to use the adult immunization schedule

1. Determine recommended vaccinations by age **(Table 1)**
2. Assess need for additional recommended vaccinations by medical condition or other indication **(Table 2)**
3. Review vaccine types, dosing frequencies and intervals, and considerations for special situations **(Notes)**
4. Review contraindications and precautions for vaccine types **(Appendix)**

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- *General Best Practice Guidelines for Immunization* www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html
- Vaccine information statements: www.cdc.gov/vaccines/hcp/vis/index.html
- Manual for the Surveillance of Vaccine-Preventable Diseases (including case identification and outbreak response): www.cdc.gov/surv-manual/php/index.html

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Scan QR code for access to online schedule

CS 310821-E

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Vaccines with Recommendations

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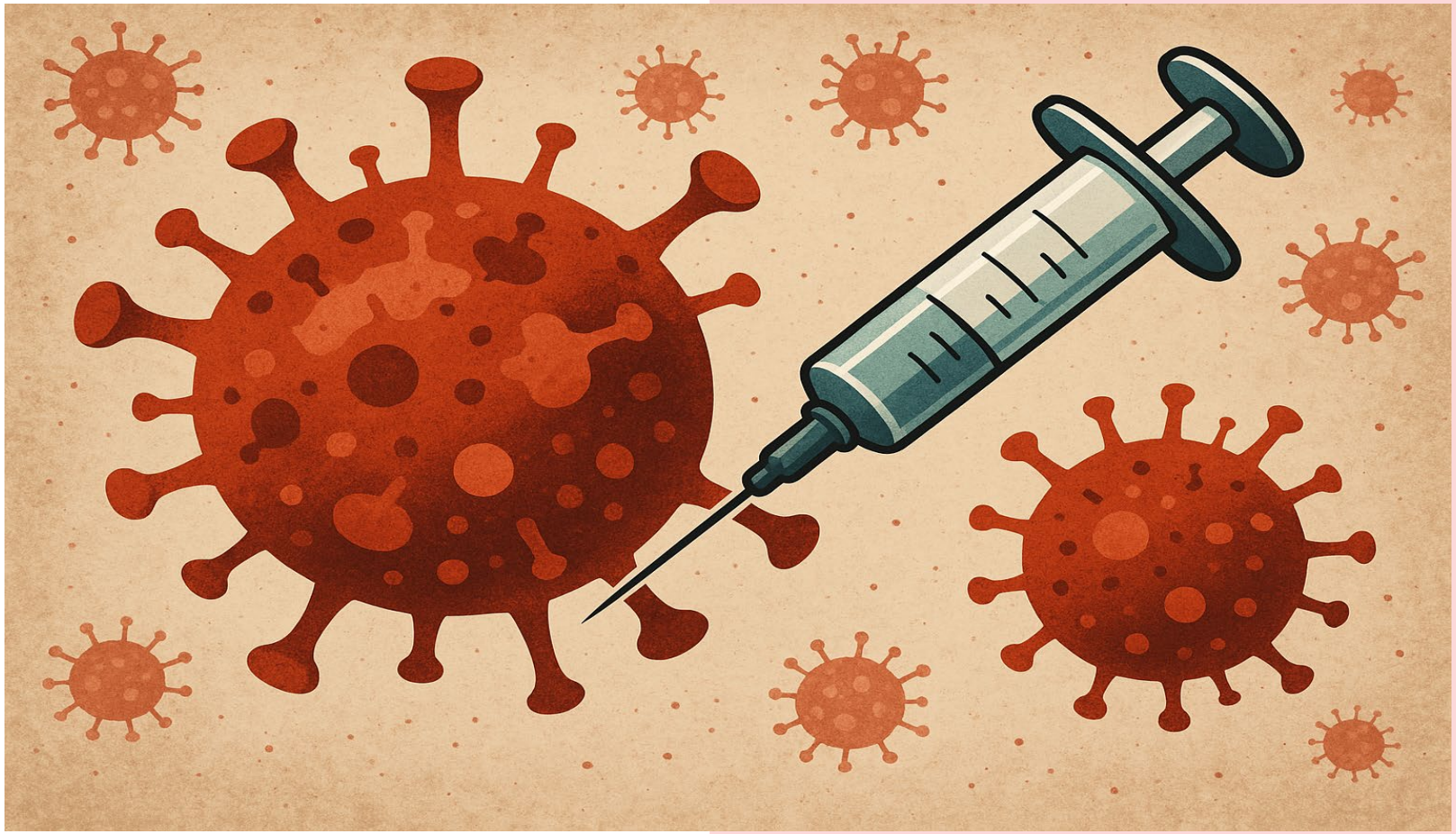
Influenza



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ACIP Recommendation - Influenza

- ACIP reaffirms the recommendation for routine annual influenza vaccination is recommended for all persons aged ≥6 months without contraindications
- ACIP recommends high-dose inactivated (HD-II3) and adjuvanted inactivated (aII3) influenza vaccine as acceptable options for influenza vaccination of solid organ transplant recipients aged 18 through 64 years receiving immunosuppressive medication regimens without a over other age-appropriate IIV3s or RIV3

Groshskopf. ACIP Meeting. June 2024

ACIP Recommendations - Influenza

- The 2025-26 recommendations include three updates, all of which reflect recent FDA approvals:
  - Influenza vaccine composition for the 2025-26 season
  - FluMist (live attenuated influenza vaccine, trivalent; LAIV3) for self- or caregiver administration
  - Change in age indication for Flublok (recombinant influenza vaccine, trivalent; RIV3) from ≥18 years to ≥9 years

Influenza Vaccine Composition 2025-2026

- For egg-based vaccines:
  - an A/Victoria/4897/2022 (H1N1)pdm09-like virus
  - **an A/Croatia/10136RV/2023 (H3N2)-like virus**
  - a B/Austria/1359417/2021 (B/Victoria lineage)-like virus

- For cell culture and recombinant vaccines:
  - an A/Wisconsin/67/2022 (H1N1)pdm09-like virus
  - **an A/District of Columbia/27/2023 (H3N2)-like virus**
  - a B/Austria/1359417/2021 (B/Victoria lineage)-like virus

Timing of Influenza Vaccines

- Unchanged from last season
- For most persons who need only 1 dose of influenza vaccine for the season: September or October
- Vaccination should continue after October and throughout the influenza season
  - Influenza viruses are circulating
  - Unexpired vaccine is available
- Vaccination during July and August not recommended for most groups, **except**:
  - Pregnant persons in the third trimester
  - Children <9 years who need 2 doses in one season
  - There is concern that vaccination later in the season might not be possible

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Grohskopf. https://www.cdc.gov/mmwr/volumes/72/rr/rr7202a1.htm

FluMist for Self/Caregiver Administration is same FDA-recommended and approved FluMist vaccine, simply delivered to the home

FluMist®
Influenza Vaccine
Live, Intranasal

WHO

Extends the options for who can administer needle-free vaccine

HOW

Enables administration in home settings using established online pharmacy service

WHY

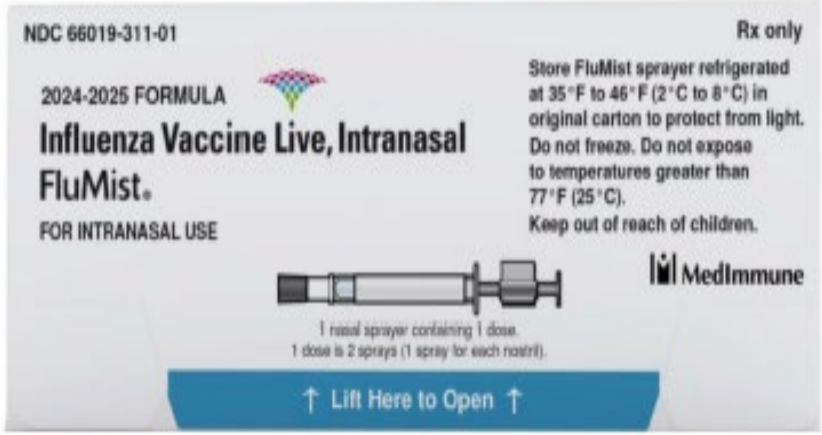
Expands access and empowers individuals to administer FluMist at home according to ACIP recommendations

Bandell. ACIP Meeting. April 2025.

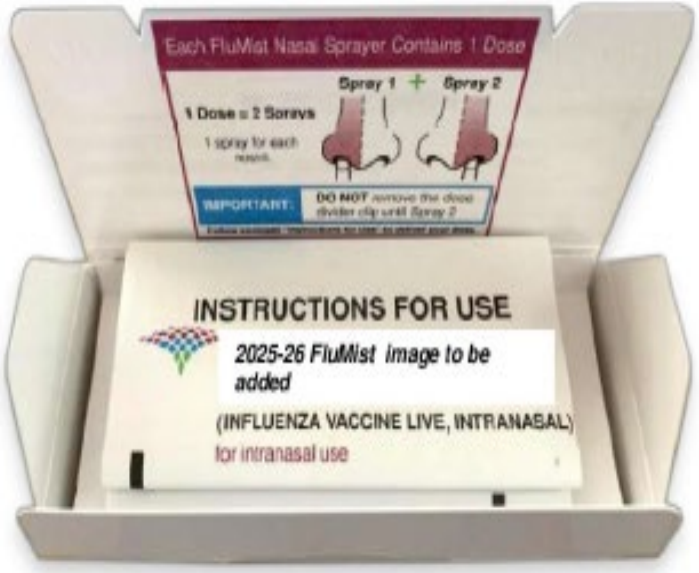
FluMist at Home

- Same FluMist as available from healthcare providers, packaged for delivery for administration by eligible patients
- “FluMist Home” is an online pharmacy service supporting, ordering, delivering, and documenting self/caregiver administration
  - Confirm eligibility and write prescription
    - Based on state scope of pharmacy practice
  - Accept payment through insurance and then cost for shipping
  - Packaging for delivery, use within 12 hours outside of refrigerator
  - Children < 18 years should not self-administer
  - Text messaging to confirm administration
  - Reporting to Immunization Information Systems
- Return shipment program provides materials and instructions to safely dispose of FluMist following use

Top of Package



View Once Top Is Lifted



Bandell. ACIP Meeting. April 2025.

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ACIP Recommendation - Influenza

- ACIP recommends children 18 years and younger receive season influenza vaccines only in single dose formulations that are free of thimerosal as a preservative
- ACIP recommends pregnant women receive season influenza vaccines only in single dose formulations that are free of thimerosal as a preservative
- ACIP recommends all adults receive season influenza vaccines only in single dose formulations that are free of thimerosal as a preservative

Thimerosal – Key Facts

- All vaccines routinely recommended for children 6 years of age and younger in the U.S. are available in formulations that do not contain thimerosal
- Vaccines that do not contain thimerosal as a preservative are also available for adolescents and adults
- A robust body of peer-reviewed scientific studies conducted in the U.S. and other countries support the safety of thimerosal-containing vaccines
- Preservatives prevent microbial growth
- The use of thimerosal as a preservative in vaccines has markedly declined due to reformulation and development of vaccines supplied in single-use presentations

Applying it to Practice

75 year-old patient presents for an influenza vaccine. The patient's immunization record is as follows:

Childhood vaccines including MMR
Influenza vaccine yearly
Tdap 5 years ago
PPSV23 5 years ago
Zoster (2 doses) 10 years ago
COVID-19 2024-2025 November 2024

Table 1 Recommended Adult Immunization Schedule by Age Group, United States, 2025

Vaccine	19–26 years	27–49 years	50–64 years	≥65 years
COVID-19	1 or more doses of 2024–2025 vaccine (See Notes)			2 or more doses of 2024–2025 vaccine (See Notes)
Influenza inactivated (IIV3, ccIIV3) **Influenza recombinant** (RIV3)	1 dose annually			1 dose annually (HD–IIV3, RIV3, or aIIV3 preferred)
Influenza inactivated (aIIV3; HD–IIV3) **Influenza recombinant** (RIV3)	Solid organ transplant (See Notes)			
Influenza live, attenuated (LAIV3)	1 dose annually			
Respiratory syncytial virus (RSV)	Seasonal administration during pregnancy (See Notes)		60 through 74 years (See Notes)	≥75 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 health care 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, PCV21, PPSV23)			See Notes	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	2 doses			
Inactivated poliovirus (IPV)	Complete 3-dose series if incompletely vaccinated. Self–report of previous doses acceptable (See Notes)			

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 Guidance/ Not Applicable

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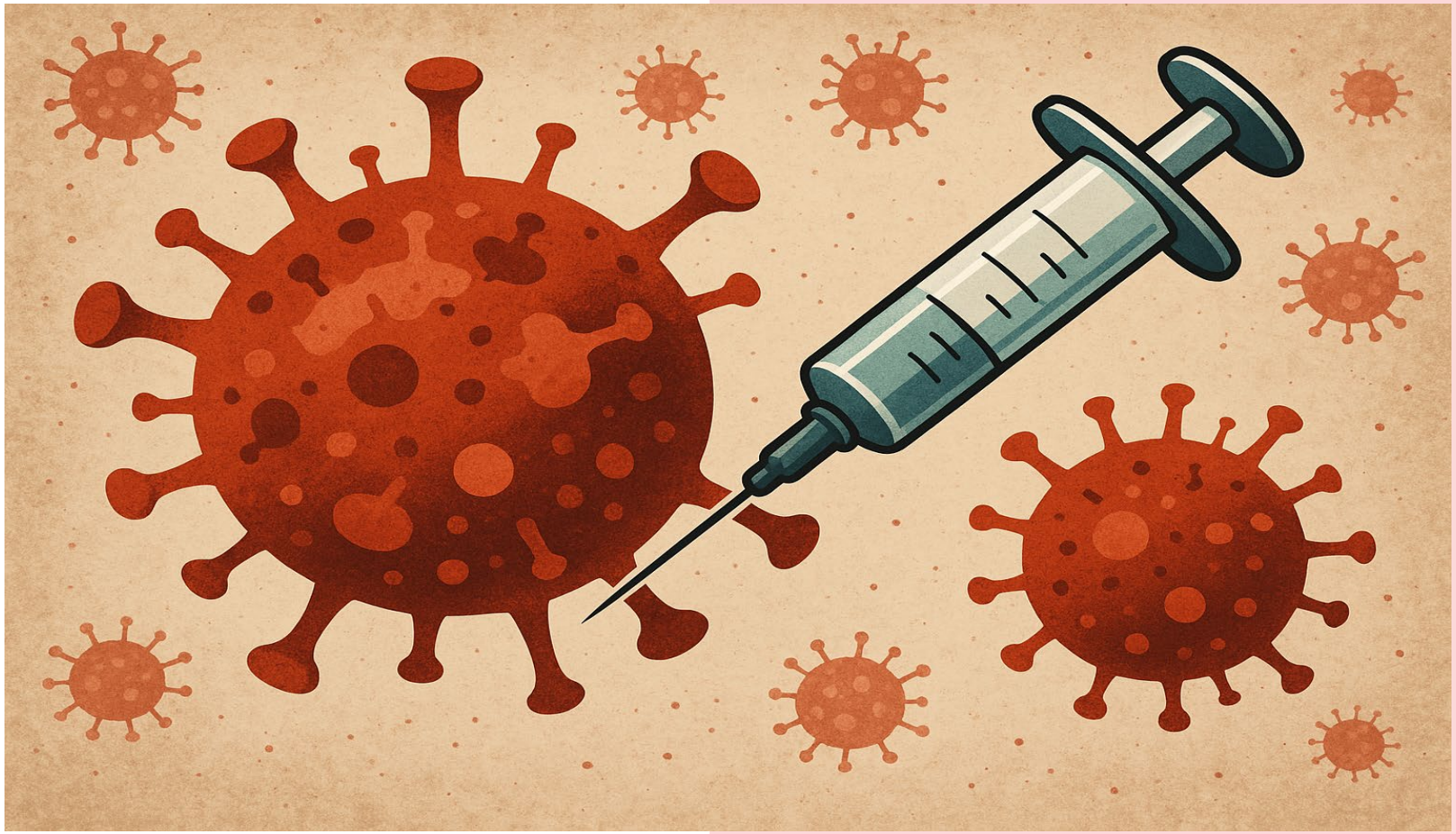
What vaccines are recommended today?

A. High-dose influenza vaccine, PCV21, RSV
B. Inactivated influenza vaccine, PCV21
C. High-dose influenza vaccine, PPSV23, RSV
D. Tdap, adjuvanted-influenza vaccine, PCV20

Pneumococcal



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Current Pneumococcal Vaccines

	1	3	4	5	6A	6B	7F	9V	14	18C	19A	19F	23F	22F	33F	8	10A	11A	12F	15B	2	9N	17F	20	15A	15C	16F	23A	23B	24F	31	35B
PCV15																																
PCV20																																
PPSV23																																
PCV21																																

21-valent pneumococcal conjugate vaccine (CAPVAXIVE™, Merck):

- **Approved by the FDA for adults aged ≥18 years on June 17, 2024[1]**

PCV15=15-valent pneumococcal conjugate vaccine PCV20=20-valent pneumococcal conjugate vaccine PCV21=21-valent pneumococcal conjugate vaccine PPSV23=23-valent pneumococcal polysaccharide vaccine

1. U.S. FDA Approves CAPVAXIVE (Pneumococcal 21-valent Conjugate Vaccine) for Prevention of Invasive Pneumococcal Disease and Pneumococcal Pneumonia in Adults - Merck.com

Loehr. ACIP Meeting. October 2024

ACIP Recommendation – Pneumococcal Vaccine

- Adults aged ≥50 years who have not received a PCV
- Adults aged 19–49 years with certain underlying conditions or risk factors who have not received a PCV
- Certain adults who have received PCV13 but have not received PCV20 or PCV21

Adults ≥50 years old
Complete pneumococcal vaccine schedules

Prior vaccines	Option A	Option B
None*	**PCV20 or PCV21**	**PCV15** → ≥1 year† → **PPSV23**¶
PPSV23 only at any age	≥1 year → **PCV20 or PCV21**	≥1 year → **PCV15**
PCV13 only at any age	≥1 year → **PCV20 or PCV21**	NO OPTION B
PCV13 at any age & **PPSV23** at <65 yrs	≥5 years → **PCV20 or PCV21**	

* Also applies to people who received PCV7 at any age and no other pneumococcal vaccines
¶ If PPSV23 is not available, PCV20 or PCV21 may be used
† 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 for adults ≥65 years old
Complete series: **PCV13** at any age & **PPSV23** at ≥65 yrs	≥5 years → **PCV20 or PCV21** — Together, with the patient, vaccine providers **may choose** to administer PCV20 or PCV21 to adults ≥65 years old who have already received PCV13 (but not PCV15, PCV20, or PCV21) at any age and PPSV23 at or after the age of 65 years old.

Adults 19–49 years old with specified immunocompromising conditions
Complete pneumococcal vaccine schedules

Prior vaccines	Option A	Option B
None*	PCV20 or PCV21	PCV15 → ≥8 weeks → PPSV23[¶]
PPSV23 only	≥1 year → PCV20 or PCV21	≥1 year → PCV15
PCV13 only	≥1 year → PCV20 or PCV21	NO OPTION B
PCV13 and 1 dose of PPSV23	≥5 years → PCV20 or PCV21	NO OPTION B
PCV13 and 2 doses of PPSV23	≥5 years → PCV20 or PCV21	**No vaccines** recommended at this time. Review pneumococcal vaccine recommendations again when your patient turns 50 years old.
Immunocompromising conditions	▪ Chronic renal failure ▪ Congenital or acquired asplenia ▪ Congenital or acquired immunodeficiency[§] ▪ Generalized malignancy ▪ HIV infection ▪ Hodgkin disease ▪ Iatrogenic immunosuppression[¶] ▪ Leukemia ▪ Lymphoma ▪ Multiple myeloma ▪ Nephrotic syndrome ▪ Sickle cell disease/other hemoglobinopathies ▪ Solid organ transplant	

Same for cochlear implants and CSF leaks

* Also applies to people who received PCV7 at any age and no other pneumococcal vaccines
[¶] If PPSV23 is not available, PCV20 or PCV21 may be used
[†] The minimum interval for PPSV23 is ≥8 weeks since last PCV13 dose and ≥5 years since last PPSV23 dose
[§] Includes B- (humoral) or T-lymphocyte deficiency, complement deficiencies (particularly C1, C2, C3, and C4 deficiencies), and phagocytic disorders (excluding chronic granulomatous disease)
[¶] Includes diseases requiring treatment with immunosuppressive drugs, including long-term systemic corticosteroids and radiation therapy

Adults 19–49 years old with chronic health conditions
Complete pneumococcal vaccine schedules

Prior vaccines	Option A	Option B
None*	**PCV20 or PCV21**	**PCV15** → ≥1 year → **PPSV23**¶
PPSV23 only	≥1 year → **PCV20 or PCV21**	≥1 year → **PCV15**
PCV13† **only**	≥1 year → **PCV20 or PCV21**	NO OPTION B
PCV13† and **PPSV23**	**No vaccines** are recommended at this time. Review pneumococcal vaccine recommendations again when your patient turns 50 years old.	
Chronic health conditions	▪ Alcoholism ▪ Chronic heart disease, including congestive heart failure and cardiomyopathies ▪ Chronic liver disease	▪ Chronic lung disease, including chronic obstructive pulmonary disease, emphysema, and asthma ▪ Cigarette smoking ▪ Diabetes mellitus

* Also applies to people who received PCV7 at any age and no other pneumococcal vaccines
¶ If PPSV23 is not available, PCV20 or PCV21 may be used
† Adults with chronic medical conditions were previously not recommended to receive PCV13

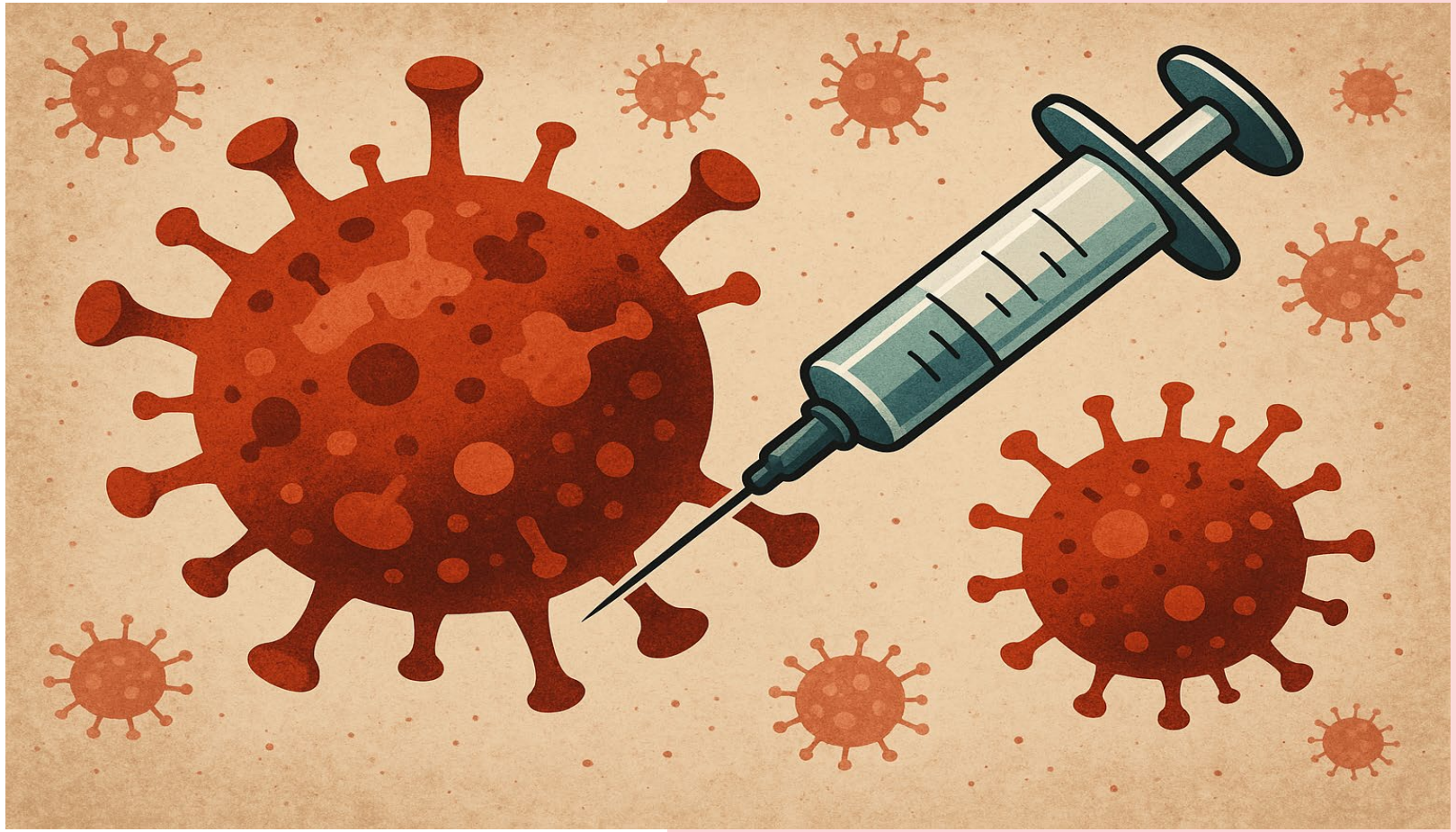
PneumoRecs VaxAdvisor App for Vaccine Providers

KEY POINTS

- Use PneumoRecs VaxAdvisor to quickly and easily determine which pneumococcal vaccines a patient needs and when.
- Mobile and web versions are available and free to use.
- The PneumoRecs VaxAdvisor app was updated on December 11, 2024, to reflect CDC's updated adult pneumococcal vaccination recommendations.
- If you're still seeing 19 through 64 years instead of 19 through 49 years for the age choice, please uninstall and reinstall the app.

CDC: https://www.cdc.gov/pneumococcal/hcp/vaccine-recommendations/app.html

Respiratory Syncytial Virus



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RSV Vaccines - Adult

Product Manufacturer	FDA Approval	Dosage	Administration
Adjuvanted RSVPreF3 (Arexvy) GSK	May 3, 2023 60 years and older June 7, 2024 50-59 years and older at increased risk	Single 0.5 mL IM	2 vials Adjuvant suspension component Lyophiized antigen component (powder)
Bivalent RSVpreF (Abrysvo) Pfizer	May 31, 2023 60 years and older October 22, 2024 18-59 years and older at increased risk	Single 0.5 mL IM	Vial of lyophilized antigen (powder) Syringe of sterile water component and vial adapter
Nucleoside modified mRNA encoding the RSV F glycoprotein stabilized in pre F protein - mRNA-1345 (mRESVIA) Moderna	May 31, 2024 60 years and older June 12, 2025 18-59 years at increased risk	Single 0.5 mL IM	Pre-filled syringe that contains a frozen suspension - must be thawed prior to use

ACIP Recommendation – RSV Vaccine (Adult)

- All adults aged ≥75 years and adults aged 50–74 years who are at increased risk of severe RSV disease receive a single dose of RSV vaccine

1. Recommendation is for any Food and Drug Administration–approved RSV vaccine (Arexvy [GSK]; Abrysvo [Pfizer]; or mResvia [Moderna]). There is no product preference.
2. Eligible adults are currently recommended to receive a single dose of RSV vaccine; adults who have already received RSV vaccination should not receive another dose.

Chronic Medical Conditions and Other Risk Factors Associated with Increased Risk of Severe RSV Disease

- **Chronic cardiovascular disease**
- **Chronic lung or respiratory disease**
- **Diabetes mellitus** complicated by chronic kidney disease, neuropathy, retinopathy or other end-organ damage or requiring treatment with insulin or sodium-glucose cotransporter-2 (SGLT2) inhibitor
- **Severe obesity** (body mass index ≥40 kg/m^2)
- **End stage renal disease/dialysis dependence**
- **Chronic hematologic conditions**
- **Chronic liver disease**
- **Neurological or neuromuscular conditions** causing impaired airway clearance or respiratory muscle weakness
- **Residence in a nursing home**
- **Moderate or severe immunocompromise**
- Other chronic medical conditions or risk factors that a provider determines would increase risk of severe disease due to viral respiratory infection (e.g., frailty)

Applying it to Practice

52 year old female presents to the pharmacy. Her vitals for the visit are as follows:

BP 130/70, P86, Ht 5’6”, Weight 190 lbs

Medications include the following:

- Metformin ER 500 mg 2 tablets twice daily
- Valsartan 80 mg once daily

Immunization record reveals the following:

- Childhood vaccines: DTaP, MMR, IPV
- Yearly influenza vaccine
- PPSV23 5 years ago
- Tdap 5 years ago

Table 2 Recommended Adult Immunization Schedule by Medical Condition or Other Indication, United States, 2025

Always use this table in conjunction with Table 1 and the Notes that follow. Medical conditions or indications are often not mutually exclusive. If multiple medical conditions or indications are present, refer to guidance in all relevant columns. See Notes for medical conditions or indications not listed.

VACCINE	Pregnancy	Immunocompromised (excluding HIV infection)	HIV infection CD4 percentage and count		Men who have sex with men	Asplenia, complement deficiency	Heart or lung disease	Kidney failure, End-stage renal disease or on dialysis	Chronic liver disease; alcoholism[a]	Diabetes	Health care Personnel[b]
			<15% or <200/mm³	≥15% and ≥200/mm³							
COVID-19		See Notes									
Influenza inactivated Influenza recombinant		Solid organ transplant (See Notes)	1 dose annually								
LAIV3					1 dose annually if age 19–49 years		1 dose annually if age 19–49 years				
RSV	Seasonal administration (See Notes)	See Notes				See Notes			Liver disease (See Notes)	See Notes	
Tdap or Td	Tdap: 1 dose each pregnancy	1 dose Tdap, then Td or Tdap booster every 10 years									
MMR	•										
VAR	•			See Notes							
RZV		See Notes									
HPV	•	3-dose series if indicated									
Pneumococcal											
HepA											
Hep B	See Notes									Age ≥ 60 years	
MenACWY											
MenB											
Hib		HSCT: 3 doses[c]				Asplenia: 1 dose					
Mpox	See Notes				See Notes						See Notes
IPV		Complete 3-dose series if incompletely vaccinated. Self-report of previous doses acceptable (See Notes)									

- Recommended for all adults who lack documentation of vaccination, **OR** lack evidence of immunity
- Not recommended for all adults, but recommended for some adults based on either age **OR** increased risk for or severe outcomes from disease
- Recommended vaccination based on shared clinical decision-making
- Recommended for all adults, and additional doses may be necessary based on medical condition or other indications. See Notes.
- Precaution: Might be indicated if benefit of protection outweighs risk of adverse reaction
- Contraindicated or not recommended *Vaccinate after pregnancy, if indicated
- No Guidance/ Not Applicable

a. Precaution for LAIV3 does not apply to alcoholism.

b. See Notes for influenza; hepatitis B; measles, mumps, and rubella; and varicella vaccinations.

c. Hematopoietic stem cell transplant.

Table 1 Recommended Adult Immunization Schedule by Age Group, United States, 2025

Vaccine	19–26 years	27–49 years	50–64 years	≥65 years
COVID-19	1 or more doses of 2024–2025 vaccine (See Notes)			2 or more doses of 2024–2025 vaccine (See Notes)
Influenza inactivated (IIV3, ccIIV3) **Influenza recombinant** (RIV3)	1 dose annually			1 dose annually (HD–IIV3, RIV3, or aIIV3 preferred)
Influenza inactivated (aIIV3; HD–IIV3) **Influenza recombinant** (RIV3)	Solid organ transplant (See Notes)			
Influenza live, attenuated (LAIV3)	1 dose annually			
Respiratory syncytial virus (RSV)	Seasonal administration during pregnancy (See Notes)		60 through 74 years (See Notes)	≥75 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 health care 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, PCV21, PPSV23)			See Notes	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	2 doses			
Inactivated poliovirus (IPV)	Complete 3-dose series if incompletely vaccinated. Self–report of previous doses acceptable (See Notes)			

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 Guidance/ Not Applicable

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RBC Cardinal Health DENVER JULY 9-12, 2025

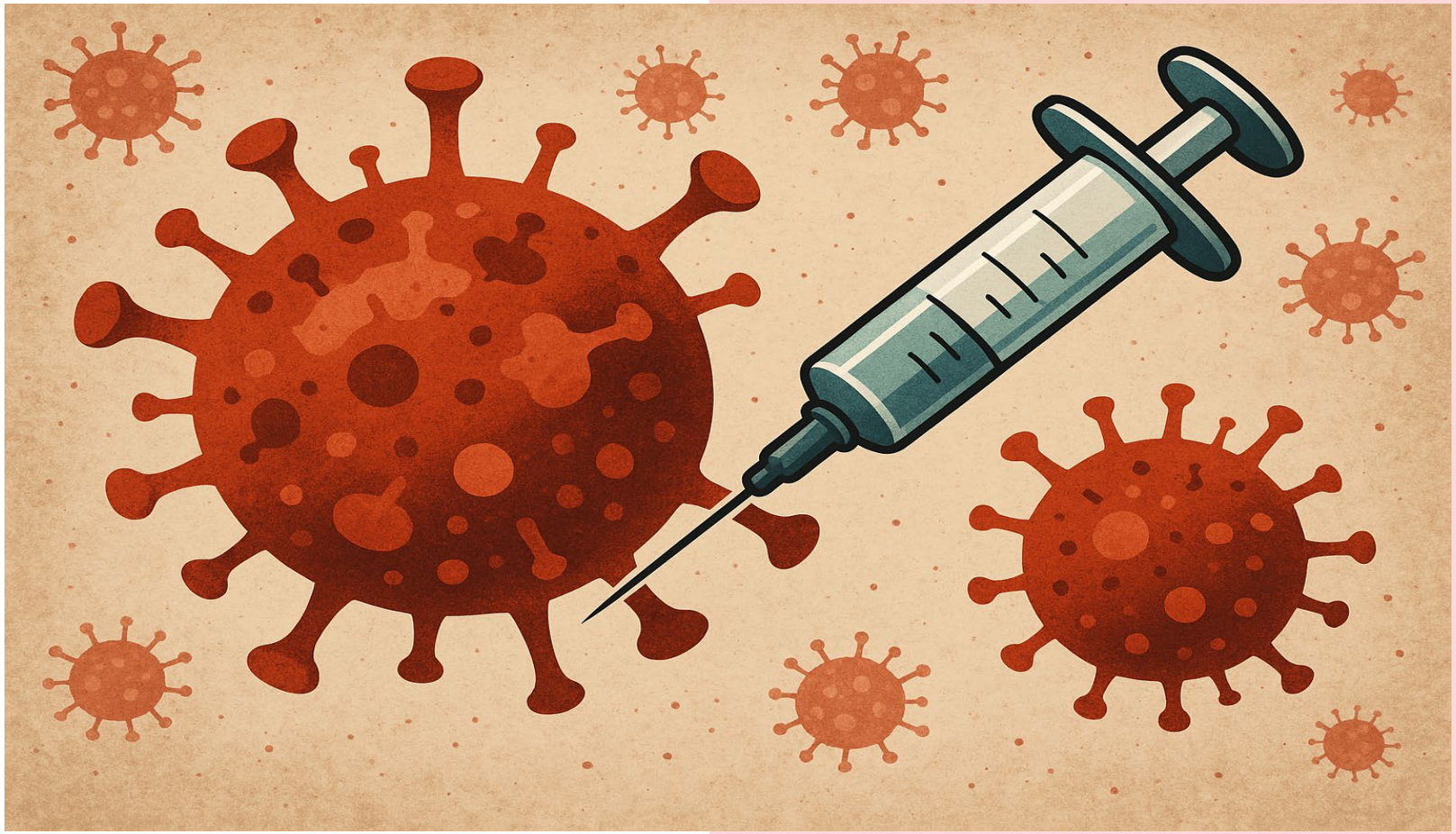
What vaccines are recommended today?

A. Zoster, PPSV23, RSV, Hepatitis B
B. Zoster, PCV20, RSV
C. PCV20, RSV, Hepatitis B
D. Zoster, PCV20, Hepatitis B

When is the next vaccine due?

A. 4 weeks
B. 2 months
C. 6 months
D. 5 years

COVID-19



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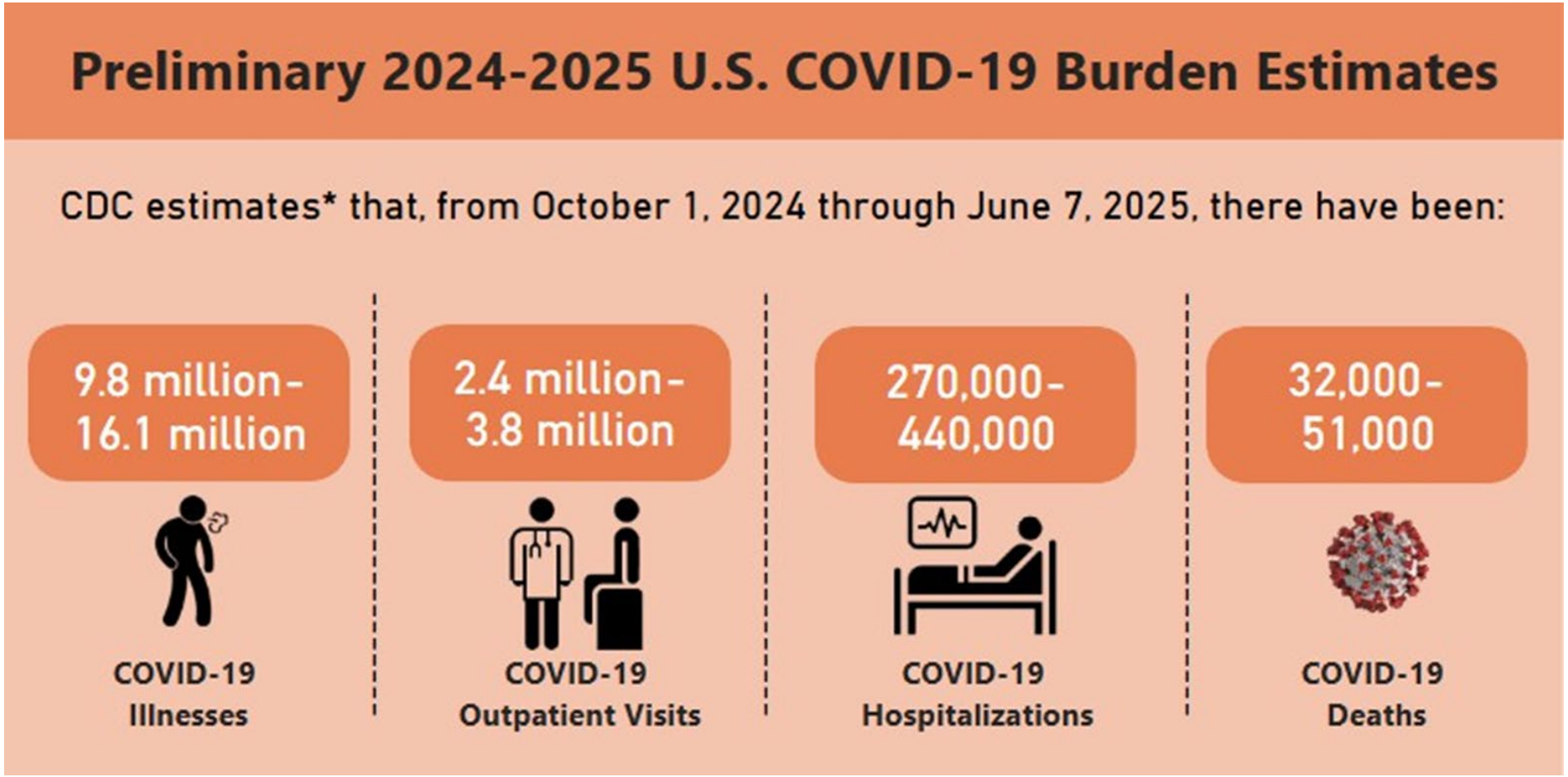
COVID-19 continues to impact Americans' health



* Based on data from September 29, 2024 through June 7, 2025.
Source: https://www.cdc.gov/covid/php/surveillance/burden-estimates.html

COVID-19 Vaccine Approvals

- FDA approved Novavax's NUVAXOVID (2024–2025 Formula) and Moderna's MNEXSPIKE (2024–2025 Formula) for people ages 12–64 years at high risk for severe COVID-19 and all adults ages 65 years and older

Comparison of Moderna COVID-19 Vaccines

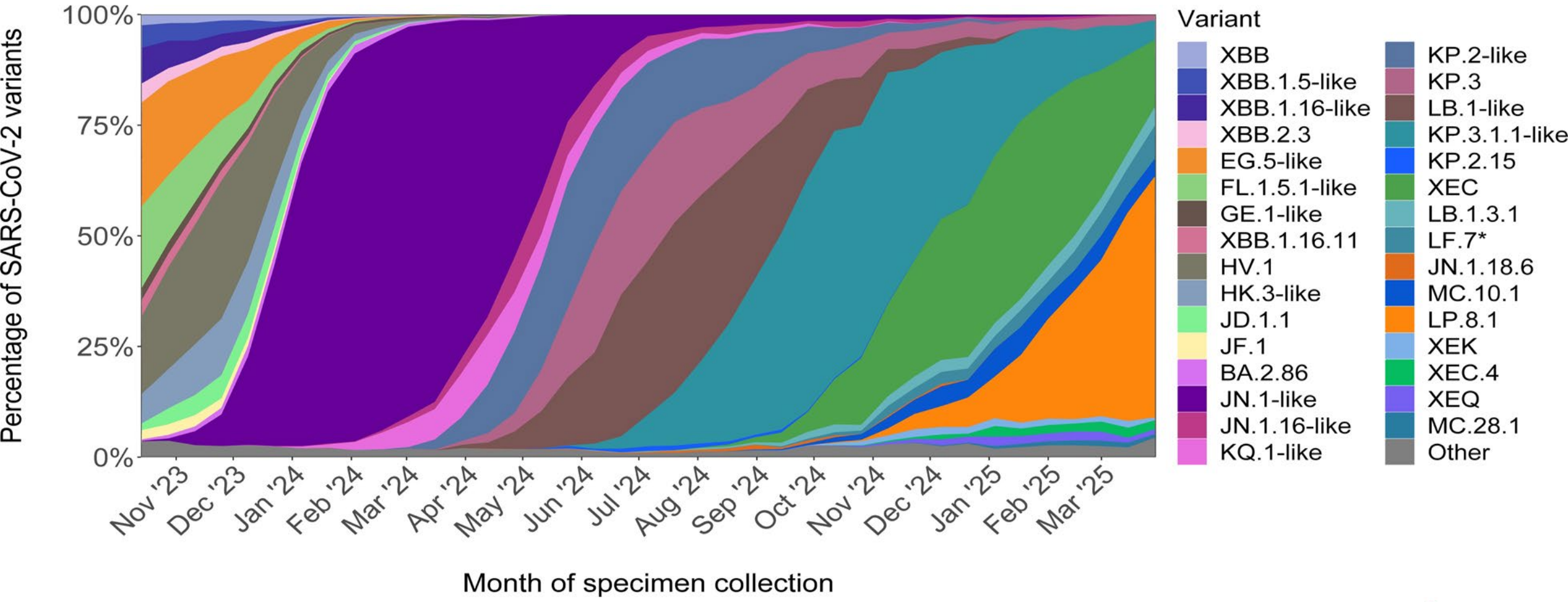
Spikevax

- Codes for the whole spike protein of SARS-CoV-2
- Indication:
  - ≥ 12 yrs of age
  - EUA for 6 mos to 11 yrs
- Dosage: 50 mcg/0.5 mL prefilled syringes IM
- Adverse effects: injection-site pain, fatigue, headache, myalgia, arthralgia, chills, axillary swelling or tenderness, and nausea/vomiting
- Storage: Frozen; after thawing refrigerate up to 60 days or for 12 hours at room temperature

mNEXSPIKE

- Codes for the N-terminal domain and the receptor-binding domain of the spike protein of the virus
- Indication:
  - ≥ 65 yrs
  - 12-64 yrs who have a condition that puts them at high risk for severe outcomes from COVID-19
- Dosage: 10 mcg/0.2 mL prefilled syringes IM
- Adverse effects: injection-site pain, fatigue, headache, myalgia, arthralgia, chills, axillary swelling or tenderness, and nausea/vomiting
- Storage: Frozen; after thawing refrigerate up to 90 days or for 24 hours at room temperature

Weighted SARS-CoV-2 Variant Proportion Estimates: XBB and JN.1 Lineages United States, October 1, 2023–March 29, 2025



* LF.7 includes LF.7, LF.7.2.1, LF7.7.1, and LF7.7.2.

† "Other" represents aggregated lineages circulating at <1% prevalence nationally during all 2-week periods displayed.

Lineages were ordered by date of first appearance on CDC's COVID data tracker (https://covid.cdc.gov/covid-data-tracker/#variant-proportions).

Lineages with identical spike receptor binding domain amino acid sequences (residues 332 to 527) were grouped with a representative lineage and denoted as "representative lineage-like."

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RBC Cardinal Health

DENVER JULY 9-12, 2025

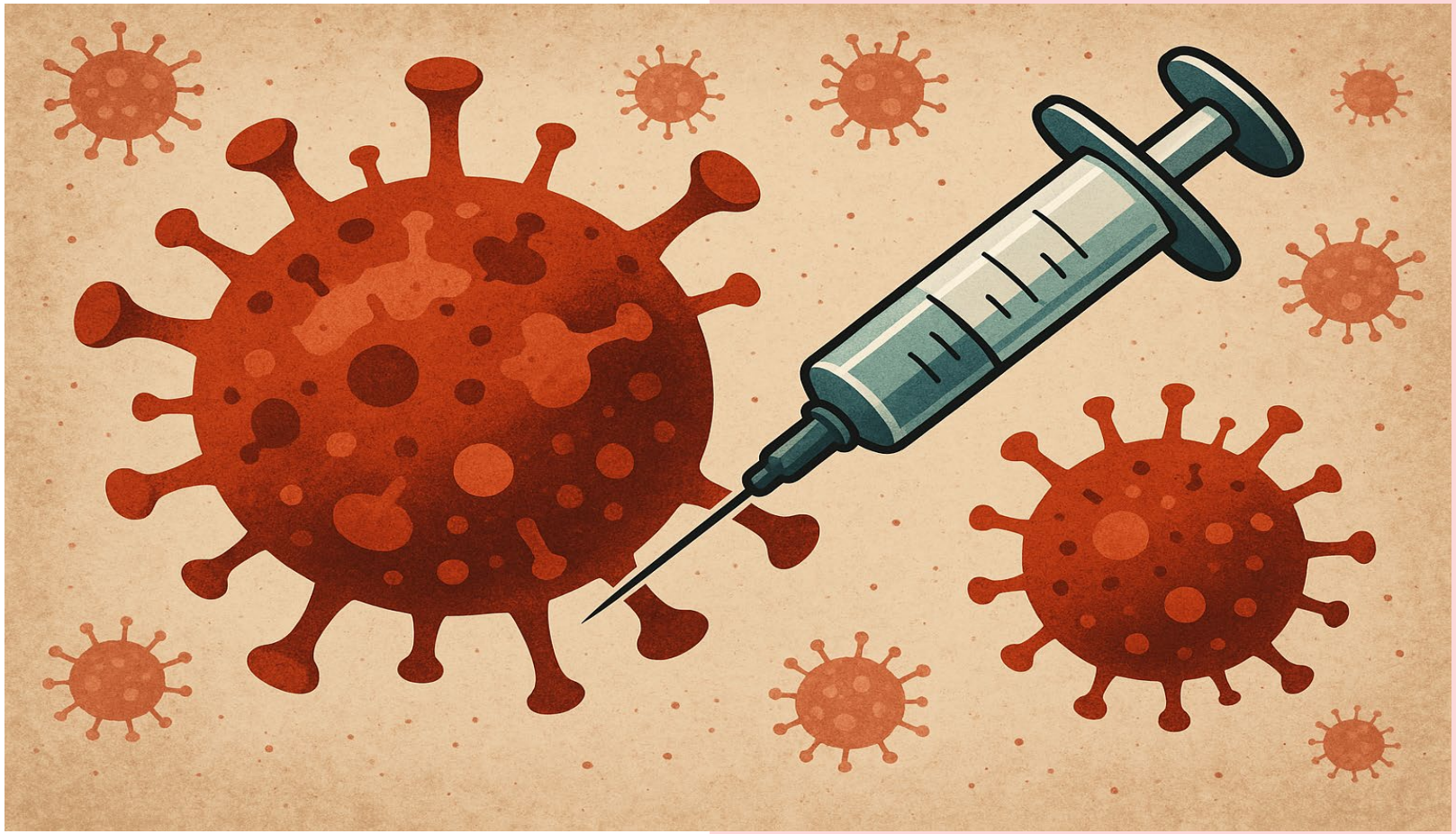
2025-2026 COVID-19 Vaccine

- FDA's Vaccines and Related Biological Products Advisory Committee (VRBPAC) reviewed genomic and phenotypic data in May and voted unanimously to recommend a monovalent JN.1-lineage vaccine composition
  - FDA has advised manufacturers to use JN.1-lineage based COVID-19 vaccines, preferentially using the LP.8.1 strain, for the 2025-2026 COVID-19 vaccines

COVID-19 Vaccine Recommendation Changes

- Per HHS directive, CDC updated COVID-19 vaccine recommendations:
  - Shared clinical decision-making for healthy children ages 6 months–17 years
  - No guidance/not applicable for pregnant women

Chikungunya



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Chikungunya Vaccines

Product	FDA Approval	Dosage Administration
CHIK-LA (IxCHIQ – Valneva) live, attenuated chikungunya has a deletion in non-structural protein 3, which encodes a component of the viral replicase complex, and replicates less efficiently than the wild-type CHIKV	18 years and older for prevention November 2023 *FDA paused use in 60 years of age and older	Lyophilized antigen component (vial) and sterile water (syringe) for reconstitution 0.5 mL administered IM
CHIK VLP (Vimkunya – Barvarian Nordic) 3 recombinant chikungunya virus (CHIKV) structural proteins that assemble into virus-like particles, which mimic the CHIKV but cannot replicate	12 years and older for prevention February 2025	Single 40 µg VLP dose (0.8 mL) in a pre-filled syringe administered IM

CHIK-LA Update – Adverse Events

- Vaccine Adverse Event Reporting System (VAERS) May – December 2024
  - 28 Reported
    - 22 Non-Serious
      - 10 chikungunya-like adverse reactions
      - 4 arthralgia or arthritis w/o fever
      - 8 other
    - 6 Serious
      - 5 hospitalizations
      - 1 other medically important event

ACIP Revised Recommendation CHIK-LA

- ACIP recommends live attenuated chikungunya vaccine for persons aged ≥18 years traveling to a country or territory where there is a chikungunya outbreak
- In addition, live attenuated chikungunya vaccine may be considered for persons aged ≥18 years traveling or taking up residence in a country or territory without an outbreak but with elevated risk for US travelers if planning travel for an extended period of time e.g., 6 months or more

#Age ≥65 is a precaution for use of CHIK-LA

FDA and CDC Recommend Pause in Use of Ixchiq (Chikungunya Vaccine, Live) in Individuals 60 Years of Age and Older While Postmarketing Safety Reports are Investigated

May 9, 2025

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ACIP Recommendation – CHIK-VLP

- ACIP recommends virus-like particle chikungunya vaccine for persons aged **≥12 years** traveling to a country or territory where there is a chikungunya outbreak.[#]
- In addition, virus-like particle chikungunya vaccine may be considered for persons aged **≥12 years** traveling or taking up residence in a country or territory without an outbreak but with elevated risk for US travelers[#] if planning travel for an extended period of time e.g., 6 months or more.

ACIP Recommendation – CHIK-VLP

- ACIP recommends virus-like particle chikungunya vaccine for laboratory workers with potential for exposure to chikungunya virus
  - Local biosafety committee should undertake risk assessment of potential for chikungunya virus exposure considering type of work to be performed
    - Biosafety level at which work is being conducted
  - Vaccination not necessary for workers handling routine clinical samples

Vaccines with Recommendation Additions

Vaccine	ACIP Recommendation

MenABCWY (Penmenvy -GSK	• May be used when both MenACWY and MenB are indicated at the same visit for:
	  • Healthy persons aged 16–23 years (routine schedule) when shared clinical decision- making favors administration of MenB vaccine and
	  • Persons aged ≥10 years who are at increased risk for meningococcal disease (e.g., because of persistent complement deficiencies, complement inhibitor use, or functional or anatomic asplenia)

RSV Monoclonal Antibody (clesrovimab)	• Infants aged < 8 months entering their first RSV season who are not protected by maternal vaccination receive one dose of clesrovimab

Applying it to Practice

Which one of the following patients is recommended to receive a MenABCWY vaccine based on shared clinical decision-making?

A. 12-year-old patient with no previous meningococcal vaccines
B. 16-year-old patient with one dose of MenACWY vaccine and receiving next dose of meningococcal vaccine
C. 17-year-old patient with two previous doses of MenACWY vaccine
D. 17-year-old college student with two doses of MenACWY vaccine and one dose of MenB

Summary

- Influenza vaccine recommendation additions for SOT; removal of thimerosal
- New COVID-19 vaccine composition and changes made by HHS for children and pregnant women
- Expanded PCV vaccine recommendations for individuals 50 years and older
- Expanded adult RSV vaccine recommendations for individuals 50 years and older with increased risk for severe RSV Disease
- Recommendations for new Chikungunya VLP vaccine for travelers 12 years and older and laboratory workers
    - New pause in use of Chikungunya Live vaccine for 60 years and older

Assessment Question #1

A 40 year old kidney transplant patient on immunosuppressive therapy presents to the pharmacy for an influenza vaccine. Which of the following is an appropriate influenza vaccine?

A. HD-II3
B. LAIV3
C. RIV3
D. IIV4

Assessment Question #2

RSV vaccine is recommended for which of the following patients?

A. 55 year old patient with no chronic conditions
B. 59 year old patient with hypertension
C. 60 year old patient with congestive heart failure
D. 65 year old patient with no chronic conditions

Assessment Question #3

What is the recommended COVID-19 vaccine composition for 2025-2026?

A. Monovalent XBB.1.5
B. Monovalent JN.1
C. Bivalent XBB.1.5 and JN.1
D. Bivalent BA.5 and JN.1

Assessment Question #4

PCV vaccine is recommended for which of the following persons?

A. 25 year old with a history of pneumonia
B. 40 year old man with hypertension
C. 45 year old woman without any chronic conditions
D. 56 year old man without any chronic conditions

Questions?

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