Update on Adult Immunization Schedule and Implementation for for Adult Vaccination Success

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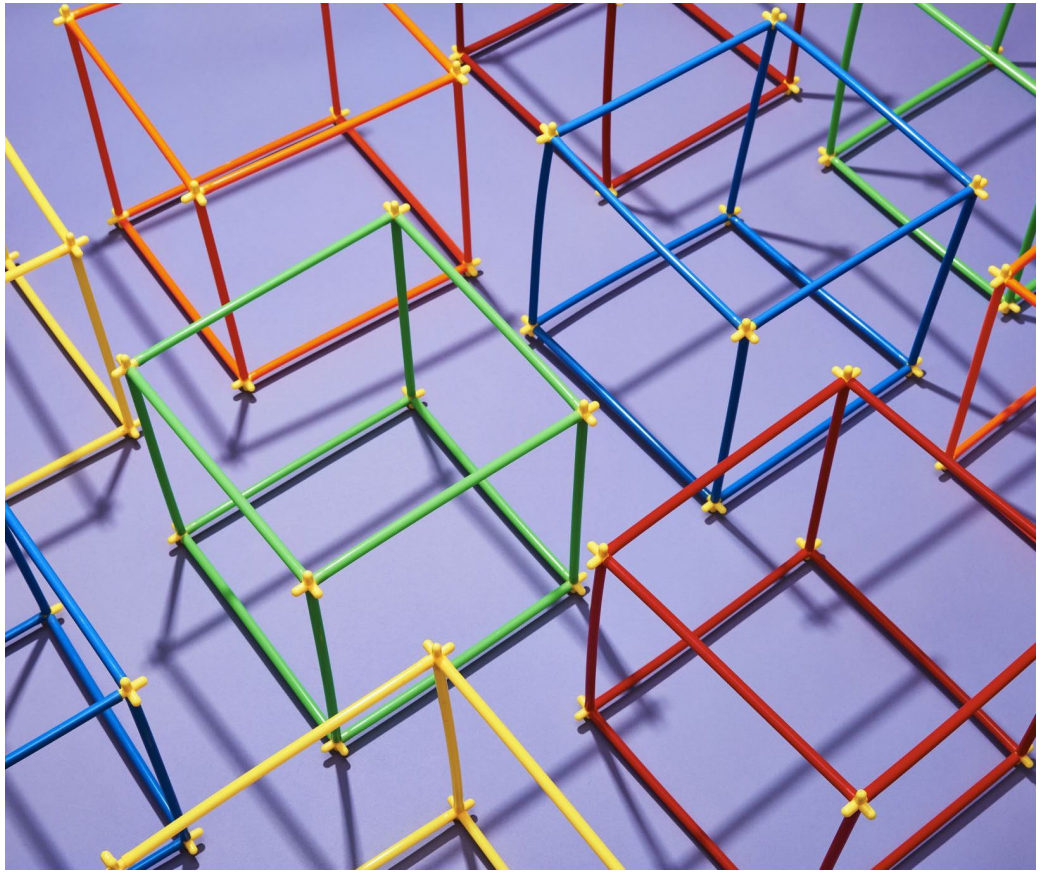
Financial Conflicts of Interest

- No financial conflicts of interest
- Previously (>2 years ago) received compensation for my time on scientific advisory committees for Dynavax and Merck
- I will not discuss any vaccines recommended other than those published by CDC or approved/authorized by FDA

Outline

- Landscape of adult immunizations challenges
- Updates to 2023 adult immunization schedule
  - COVID-19 vaccines
  - Pneumococcal vaccines
- RSV vaccines recently FDA approved
- Integrating immunizations into clinical care
  - Payment issues
  - Tools and resources
- Conclusions



Challenges For Adult Immunization Compared to Pediatrics

- Adults see many different providers and some have no primary care provider
  - Challenges with knowing which vaccines someone has had and who is “responsible” for ensuring adults are up-to-date
- Vaccinations less integrated into routine adult care
  - Acute issues take precedence over preventive care
- Few vaccine requirements for adults
  - E.g., school vaccine requirements a facilitator for children
- Complex adult vaccination schedule with many risk-based (vs age-based) recommendations and changing recommendations

Adult Schedule Updated Annually

Table 1 COVID-19 vaccination recommendations have changed. Find the latest recommendations at www.cdc.gov/covidschedule

Recommended Adult Immunization Schedule for ages 19 years or older, United States, 2023

Vaccine	19–26 years	27–49 years	50–64 years	≥65 years
COVID-19	2- or 3- dose primary series and booster (See Notes)			
Influenza inactivated (IIV4) or Influenza recombinant (RIV4) — or — Influenza live, attenuated (LAIV4)	1 dose annually — or — 1 dose annually			
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)	1 dose PCV15 followed by PPSV23 OR 1 dose PCV20 (see notes)			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)	2 or 3 doses depending on vaccine and indication, see notes for booster recommendations			
	19 through 23 years			
Haemophilus influenzae type b (Hib)	1 or 3 doses depending on indication			

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

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

Recommended vaccination based on shared clinical decision-making

No recommendation/ Not applicable

Table 2 Recommended Adult Immunization Schedule by Medical Condition or Other Indication, United States, 2023

Vaccine	Pregnancy	Immuno-compromised (excluding HIV infection)	HIV infection CD4 percentage and count: <15% or <200 mm³	HIV infection CD4 percentage and count: ≥15% and ≥200 mm³	Asplenia, complement deficiencies	End-stage renal disease, or on hemodialysis	Heart or lung disease; alcoholism[a]	Chronic liver disease	Diabetes	Health care personnel[b]	Men who have sex with men
COVID-19		See Notes									
IIV4 or RIV4 — or — LAIV4	1 dose annually									— or — 1 dose annually	
	Contraindicated					Precaution					
Tdap or Td	1 dose Tdap each pregnancy	1 dose Tdap, then Td or Tdap booster every 10 years									
MMR	Contraindicated[c]	Contraindicated		1 or 2 doses depending on indication							
VAR	Contraindicated[c]	Contraindicated			2 doses						
RZV		2 doses at age ≥19 years			2 doses at age ≥50 years						
HPV	Not Recommended[c]	3 doses through age 26 years			2 or 3 doses through age 26 years depending on age at initial vaccination or condition						
Pneumococcal (PCV15, PCV20, PPSV23)		1 dose PCV15 followed by PPSV23 OR 1 dose PCV20 (see notes)									
HepA					2, 3, or 4 doses depending on vaccine						
HepB	3 doses (see notes)	2, 3, or 4 doses depending on vaccine or condition									
MenACWY		1 or 2 doses depending on indication, see notes for booster recommendations									
MenB	Precaution	2 or 3 doses depending on vaccine and indication, see notes for booster recommendations									
Hib		3 doses HSCT[c] recipients only			1 dose						

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

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

Recommended vaccination based on shared clinical decision-making

Precaution–vaccination might be indicated if benefit of protection outweighs risk of adverse reaction

Contraindicated or not recommended–vaccine should not be administered.

*Vaccinate after pregnancy.

No recommendation/ Not applicable

a. Precaution for LAIV4 does not apply to alcoholism. **b.** See notes for influenza; hepatitis B; measles, mumps, and rubella; and varicella vaccinations. **c.** Hematopoietic stem cell transplant.

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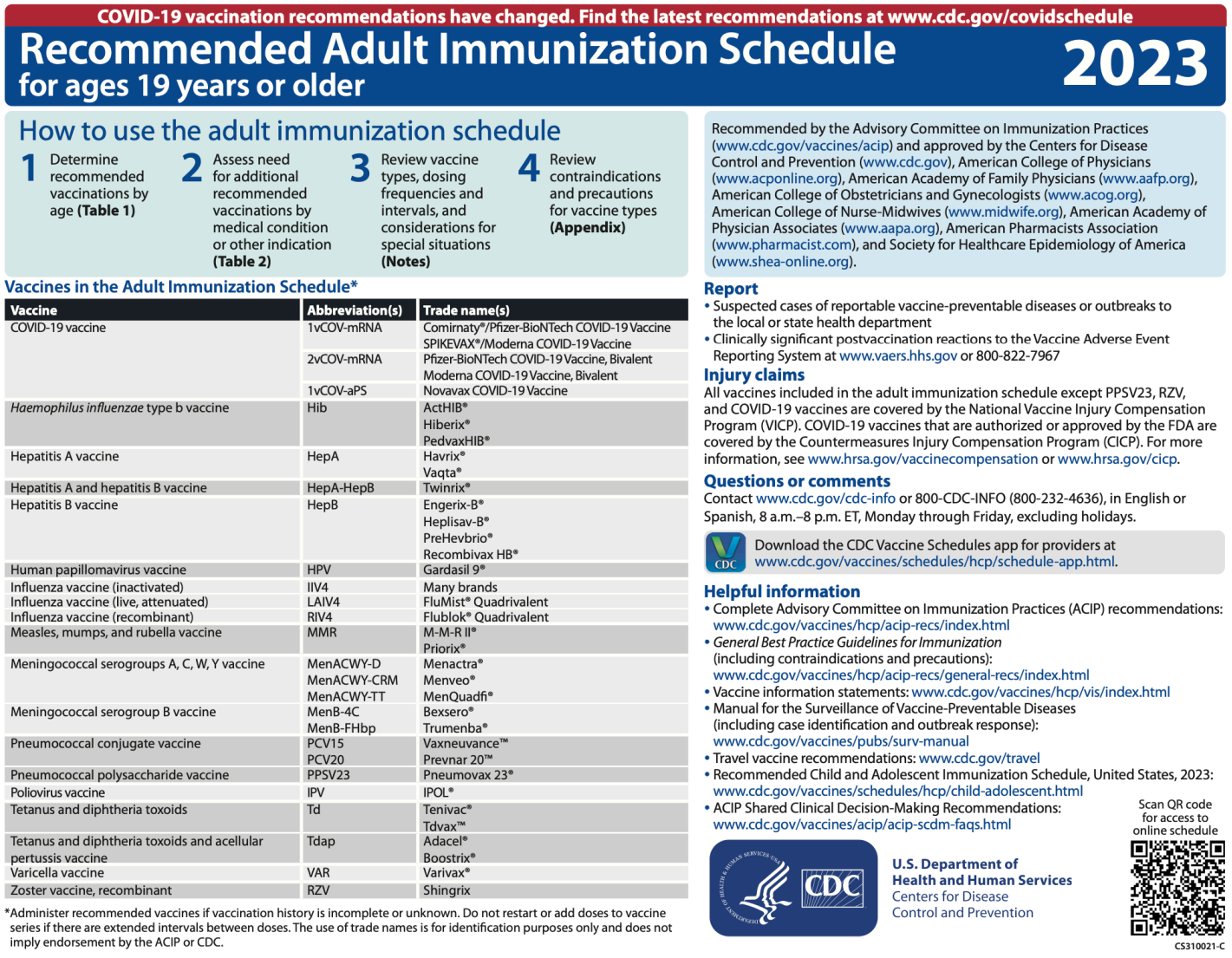
- Directions on how to use the schedule
- All vaccines, common abbreviations, and trade names listed
- New vaccines added:
  - COVID-19
  - PreHevbrio (HepB)
  - Priorix (MMR)
  - Pneumococcal conjugate vaccines: PCV15 and PCV20 (Vaxneuvance and Prevnar 20)
- Other information, e.g.,
  - Reporting to VAERs
  - Reporting injury claims
  - Links to full ACIP recommendations and travel vaccine recommendations



COVID-19 vaccination recommendations have changed. Find the latest recommendations at www.cdc.gov/covidschedule

Recommended Adult Immunization Schedule for ages 19 years or older 2023

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)**

Recommended by the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/acip) and approved by the Centers for Disease Control and Prevention (www.cdc.gov), American College of Physicians (www.acponline.org), American Academy of Family Physicians (www.aafp.org), American College of Obstetricians and Gynecologists (www.acog.org), American College of Nurse-Midwives (www.midwife.org), American Academy of Physician Associates (www.aapa.org), American Pharmacists Association (www.pharmacist.com), and Society for Healthcare Epidemiology of America (www.shea-online.org).

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
	2vCOV-mRNA	Pfizer-BioNTech COVID-19 Vaccine, Bivalent Moderna COVID-19 Vaccine, Bivalent
	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)	IIV4	Many brands
Influenza vaccine (live, attenuated)	LAIV4	FluMist® Quadrivalent
Influenza vaccine (recombinant)	RIV4	Flublok® Quadrivalent
Measles, mumps, and rubella vaccine	MMR	M-M-R II® Priorix®
Meningococcal serogroups A, C, W, Y vaccine	MenACWY-D MenACWY-CRM MenACWY-TT	Menactra® Menveo® MenQuadfi®
Meningococcal serogroup B vaccine	MenB-4C MenB-FHbp	Bexsero® Trumenba®
Pneumococcal conjugate vaccine	PCV15 PCV20	Vaxneuvance™ Prevnar 20™
Pneumococcal polysaccharide vaccine	PPSV23	Pneumovax 23®
Poliovirus vaccine	IPV	IPOL®
Tetanus and diphtheria toxoids	Td	Tenivac® Tdvax™
Tetanus and diphtheria toxoids 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.

Report

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

Injury claims

All vaccines included in the adult immunization schedule except PPSV23, RZV, and COVID-19 vaccines are covered by the National Vaccine Injury Compensation Program (VICP). COVID-19 vaccines that are authorized or approved by the FDA are covered by the Countermeasures Injury Compensation Program (CICP). For more information, see www.hrsa.gov/vaccinecompensation or www.hrsa.gov/cicp.

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/schedules/hcp/schedule-app.html.

Helpful information

- Complete Advisory Committee on Immunization Practices (ACIP) recommendations: www.cdc.gov/vaccines/hcp/acip-recs/index.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/vaccines/pubs/surv-manual
- Travel vaccine recommendations: www.cdc.gov/travel
- Recommended Child and Adolescent Immunization Schedule, United States, 2023: www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html
- ACIP Shared Clinical Decision-Making Recommendations: www.cdc.gov/vaccines/acip/acip-scdm-faqs.html

Scan QR code for access to online schedule

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Centers for Disease Control and Prevention

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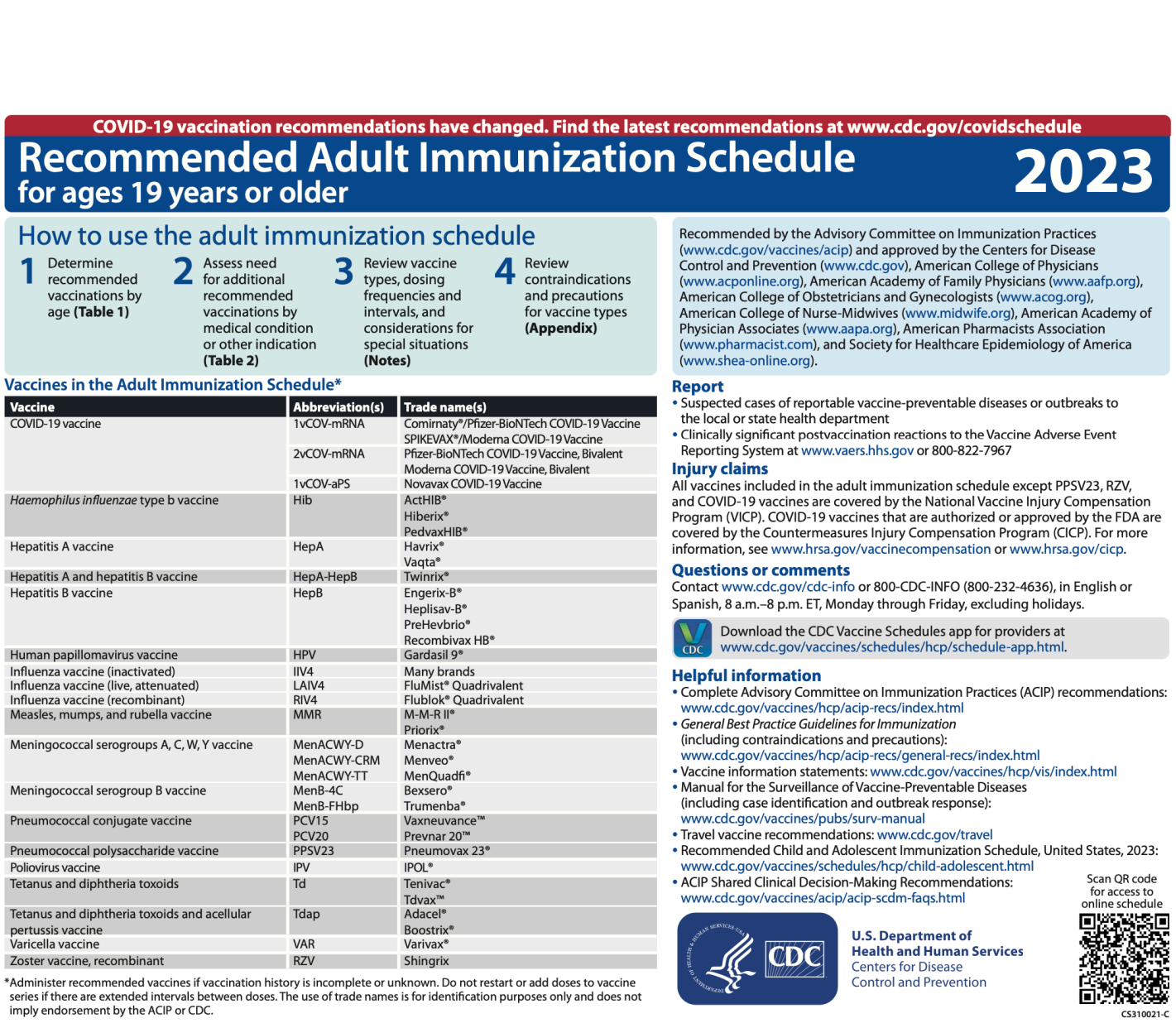

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Scan QR code for access to online schedule

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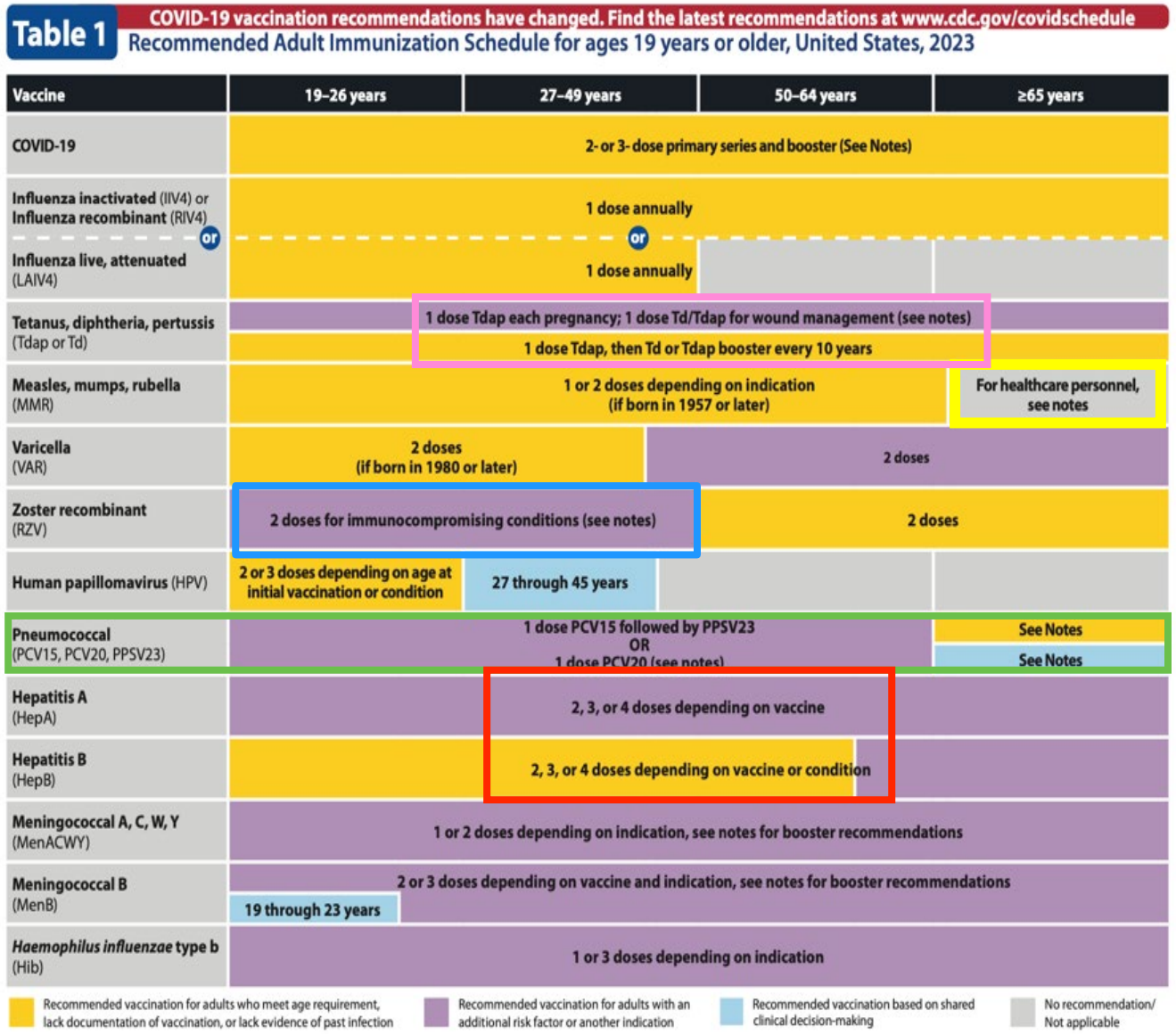
NOTE: COVID-19 Vaccine Recommendations Changed After Schedule Publication. Red banner directs people to updated COVID-19 vaccine recommendations.

Updates to 2023 Adult Immunization Schedule – Age Based



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Influenza live, attenuated (LAIV4)	1 dose annually			
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)	1 dose PCV15 followed by PPSV23 OR 1 dose PCV20 (see notes)			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)	2 or 3 doses depending on vaccine and indication, see notes for booster recommendations			
	19 through 23 years			
Haemophilus influenzae type b (Hib)	1 or 3 doses depending on indication			

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

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

Recommended vaccination based on shared clinical decision-making

No recommendation/ Not applicable

- Added COVID-19 for all adults
  - Recommendation now outdated
- Added wording on MMR bar to refer HCP to the notes section for more information
- Clarified info on Td/Tdap for 10 yr booster vs every pregnancy, and wound management
- Added immunocompromised for adults 19-49 yr in zoster section
- Updated pneumococcal vaccine
  - Added PCV15 and PCV20
  - Blue and yellow boxes for 65+ indicate vaccination depends on prior vaccinations
- Adds Hep B universal through age 59, and for increased risk and others age 60+
- Added information about 4 dose series when accelerated Twinrix series is used (0, 7 day, 21-30 days, 12 mo.) for travel

Updates to 2023 Adult Immunization Schedule – Risk Based

Table 2 Recommended Adult Immunization Schedule by Medical Condition or Other Indication, United States, 2023

Vaccine	Pregnancy	Immuno-compromised (excluding HIV infection)	HIV infection CD4 percentage and count		Asplenia, complement deficiencies	End-stage renal disease, or on hemodialysis	Heart or lung disease; alcoholism[a]	Chronic liver disease	Diabetes	Health care personnel[b]	Men who have sex with men
			<15% or <200 mm³	≥15% and ≥200 mm³							
COVID-19		See Notes									
IIV4 or RIV4	1 dose annually										
or										or	
LAIV4	Contraindicated					Precaution				1 dose annually	
Tdap or Td	1 dose Tdap each pregnancy	1 dose Tdap, then Td or Tdap booster every 10 years									
MMR	Contraindicated*	Contraindicated	1 or 2 doses depending on indication								
VAR	Contraindicated*	Contraindicated			2 doses						
RZV		2 doses at age ≥19 years			2 doses at age ≥50 years						
HPV	Not Recommended*	3 doses through age 26 years			2 or 3 doses through age 26 years depending on age at initial vaccination or condition						
Pneumococcal (PCV15, PCV20, PPSV23)		1 dose PCV15 followed by PPSV23 OR 1 dose PCV20 (see notes)									
HepA					2, 3, or 4 doses depending on vaccine						
HepB	3 doses (see notes)	2, 3, or 4 doses depending on vaccine or condition									
MenACWY	1 or 2 doses depending on indication, see notes for booster recommendations										
MenB	Precaution	2 or 3 doses depending on vaccine and indication, see notes for booster recommendations									
Hib		3 doses HSCT[c] recipients only			1 dose						

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

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Recommended vaccination based on shared clinical decision-making

Precaution–vaccination might be indicated if benefit of protection outweighs risk of adverse reaction

Contraindicated or not recommended–vaccine should not be administered.

*Vaccinate after pregnancy.

No recommendation/ Not applicable

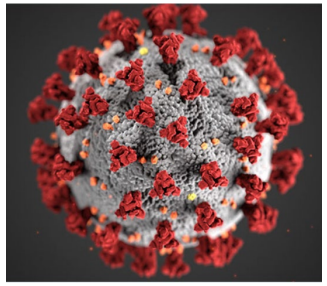
a. Precaution for LAIV4 does not apply to alcoholism. **b.** See notes for influenza; hepatitis B; measles, mumps, and rubella; and varicella vaccinations. **c.** Hematopoietic stem cell transplant.

- Added COVID-19 for all adults
  - Recommendation now outdated

COVID-19 Vaccine Recommendations for Adults

Recent Updates to CDC's COVID-19 Vaccine Interim Clinical Guidance – May 2023

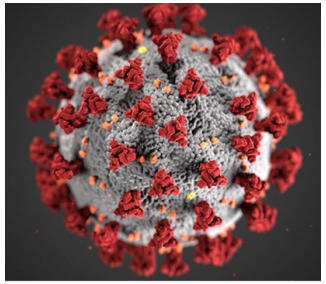
- Overall, simplification of recommendations for people 6 years and older
  - Regardless of number of prior doses of monovalent COVID-19 vaccine, one dose of updated (bivalent) COVID-19 mRNA vaccine recommended at least 8 weeks after most recent monovalent dose
  - People 65+ years may get one additional mRNA updated COVID-19 vaccine at least 4 months after the first updated dose.
- Novavax COVID-19 monovalent can be used as a booster dose for people 18 years+ who cannot or do not want to get an updated mRNA vaccine



https://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html#covid-vaccines.

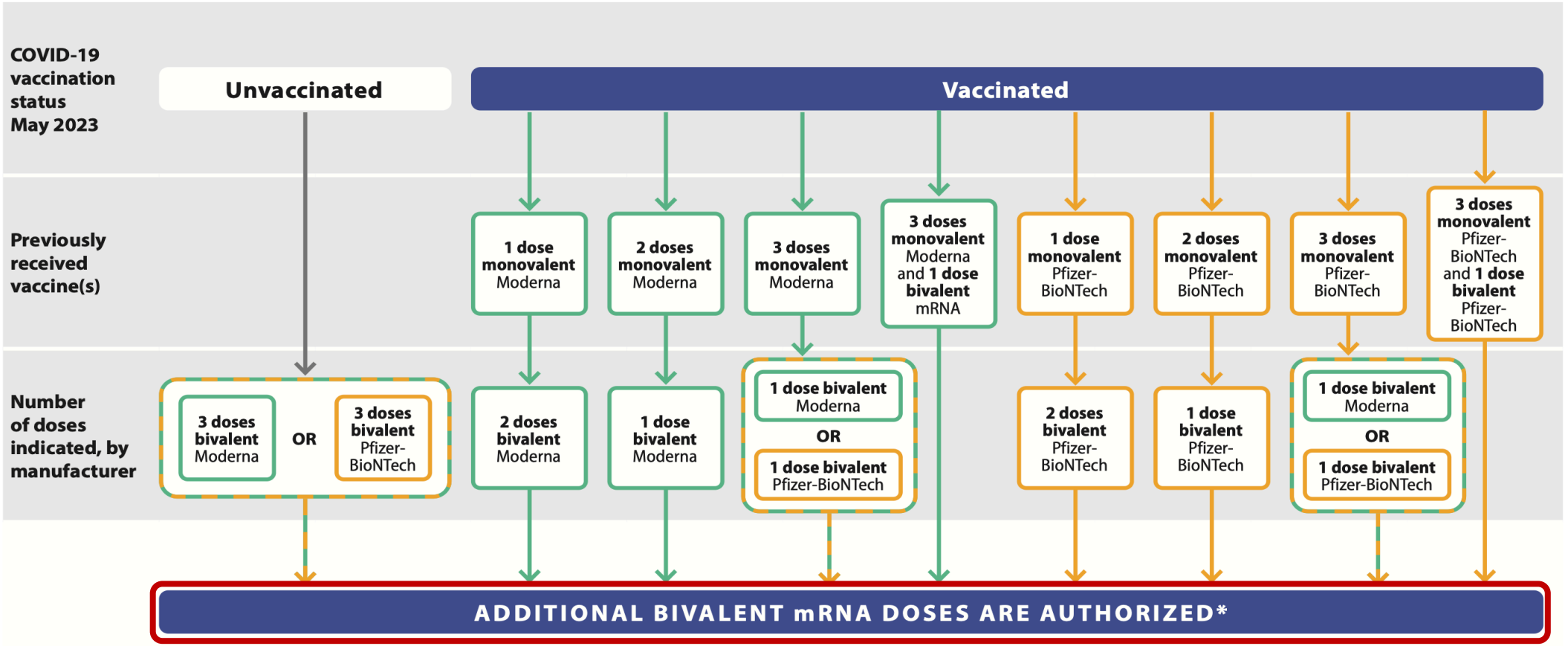
Recent Updates to CDC's COVID-19 Vaccine Interim Clinical Guidance – May 2023

- Moderately or severely immunocompromised adults
  - Should have at least 3 doses of mRNA vaccine, at least one of which is updated (bivalent) COVID-19 vaccine
  - Can get an additional mRNA updated COVID-19 vaccine ≥2 months after their first updated dose
  - May get additional updated mRNA vaccine doses in consultation with their provider
- Johnson and Johnson's Janssen vaccine no longer available
- Monovalent mRNA vaccines no longer authorized for use



https://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html#covid-vaccines.

Recommended COVID-19 vaccines for **people who ARE moderately or severely immunocompromised, aged 6 years and older,** mRNA vaccines, May 2023*



Intervals between first 3 doses are at least 4 weeks; interval if need 4th dose is at least 8 weeks.

*For product-specific dosages, administration intervals, additional dose information, and options for heterologous dosing, see Table 2 in the Interim Clinical Considerations for Use of COVID-19 Vaccines.

Key

Moderna | Pfizer-BioNTech | Moderna **OR** Pfizer-BioNTech

https://www.cdc.gov/vaccines/covid-19/downloads/COVID19-vaccination-recommendations-most-people.pdf

https://www.cdc.gov/vaccines/covid-19/downloads/COVID19-vaccination-recommendations-immunocompromised.pdf.

Pending FDA and CDC vaccine advisory committee discussions on COVID-19 vaccines

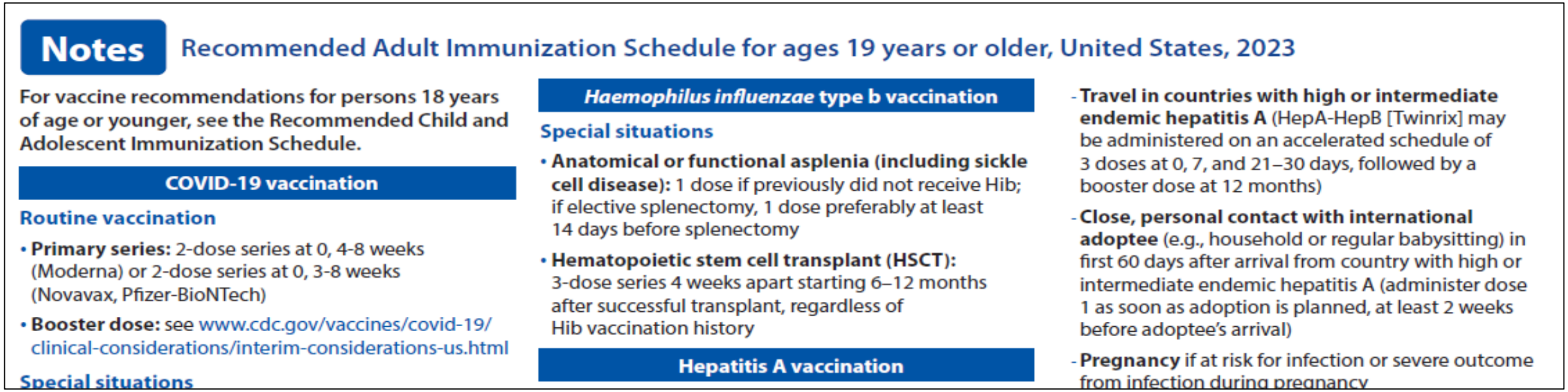
- FDA meeting June 15, 2023
  - "…discuss and make recommendations on the selection of strain(s) to be included in the periodic updated COVID-19 vaccines for the 2023-2024 vaccination campaign."

- CDC ACIP meeting June 21-23, 2023
  - No votes scheduled on COVID-19 vaccines

1. https://www.fda.gov/advisory-committees/vaccines-and-related-biological-products-advisory-committee/2023-meeting-materials-vaccines-and-related-biological-products-advisory-committee. 2. https://www.cdc.gov/vaccines/acip/index.html.

Notes Section Updates to Schedule

- Notes are critical part of the schedule
  - Contain important information for routine vaccine recommendations and special situations and populations



Notes Recommended Adult Immunization Schedule for ages 19 years or older, United States, 2023

For vaccine recommendations for persons 18 years of age or younger, see the Recommended Child and Adolescent Immunization Schedule.

COVID-19 vaccination

Routine vaccination

- **Primary series:** 2-dose series at 0, 4-8 weeks (Moderna) or 2-dose series at 0, 3-8 weeks (Novavax, Pfizer-BioNTech)
- **Booster dose:** see www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html

Special situations

***Haemophilus influenzae* type b vaccination**

Special situations

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

Hepatitis A vaccination

- **Travel in countries with high or intermediate endemic hepatitis A** (HepA-HepB [Twinrix] may be administered on an accelerated schedule of 3 doses at 0, 7, and 21–30 days, followed by a booster dose at 12 months)
- **Close, personal contact with international adoptee** (e.g., household or regular babysitting) in first 60 days after arrival from country with high or intermediate endemic hepatitis A (administer dose 1 as soon as adoption is planned, at least 2 weeks before adoptee's arrival)
- **Pregnancy** if at risk for infection or severe outcome from infection during pregnancy

https://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html#timing-spacing-interchangeability

Main Notes Section Updates to Schedule

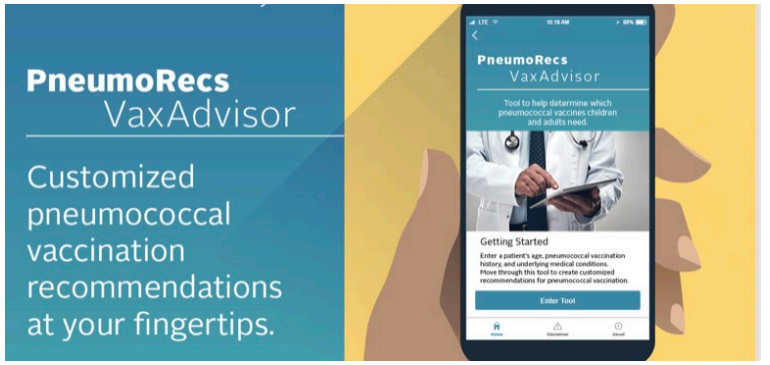
- COVID-19 notes are now outdated. Use recommendations on CDC website.
- Hepatitis B note additions
  - PreHevbrio and Heplasav-B not recommended during pregnancy
  - Twinrix (HepA and B vaccine) 3-(0, 1m, 6m) and 4-(0, 7d, 21-30d, 12m) dose schedules
- Influenza high dose or adjuvanted vaccine preferences for 65+ years
- MMR note clarifies 2 doses 1 month apart may be considered for HCP born before 1957 if no evidence of immunity
- Pneumococcal vaccine updates
- Adds noted about polio vaccination of adults at increased risk of exposure, but no addition to tables since polio vaccination not routine for adults

https://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html#timing-spacing-interchangeability

Pneumococcal Vaccine Recommendations for Adults

Pneumococcal Vaccine Recommendations for Adults

- Vaccines recommended for adults
  - PCV15 – (Vaxneuvance)
  - PCV20 – (Prevnar20)
  - PPSV23 – (Pneumovax23)



- Recommendations updated most recently in October 2022
- Combined all high-risk groups from two groups into one, including immunocompromised
- If 19-64 years AND high risk or 65+ years and previously unvaccinated, recommend either PCV20 or PCV15 plus one dose of PPSV23 1 year later.
  - If only PCV7, same recommendation as for unvaccinated

1. https://www.fda.gov/advisory-committees/vaccines-and-related-biological-products-advisory-committee/2023-meeting-materials-vaccines-and-related-biological-products-advisory-committee. 2. https://www.cdc.gov/vaccines/acip/index.html.

Pneumococcal Vaccine Recommendations for Adults

- Adults who have received PCV13 only are recommended to receive a dose of PCV20 at least 1 year after the PCV13 dose or PPSV23 as previously recommended to complete their pneumococcal vaccine series.
- Adults with an immunocompromising condition, cochlear implant, or cerebrospinal fluid leak who have received both PCV13 and PPSV23 with incomplete vaccination status are recommended to complete their pneumococcal vaccine series with either a dose of PCV20 at least 5 years after the last pneumococcal vaccine dose or PPSV23 as previously recommended.
- Shared clinical decision-making is recommended regarding PCV20 for adults aged ≥65 years who completed their vaccine series with both PCV13 and PPSV23. If a decision to administer PCV20 is made, a dose of PCV20 is recommended at least 5 years after the last pneumococcal vaccine dose.

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- Shared clinical decision-making is recommended regarding PCV20 for adults aged ≥65 years who completed their vaccine series with both PCV13 and PPSV23. If a decision to administer PCV20 is made, a dose of PCV20 is recommended at least 5 years after the last pneumococcal vaccine dose.

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High Risk Conditions

- Alcoholism
- Cerebrospinal fluid leak
- Chronic heart disease, including congestive heart failure and cardiomyopathies
- Chronic liver disease
- Chronic lung disease, including chronic obstructive pulmonary disease, emphysema, and asthma
- Chronic renal failure*
- Cigarette smoking
- Cochlear implant
- Congenital or acquired asplenia*
- Congenital or acquired immunodeficiency*
  - B- (humoral) or T-lymphocyte deficiency
  - Complement deficiency, particularly C1, C2, C3, or C4 deficiency
  - Phagocytic disorder, excluding chronic granulomatous disease
- Diabetes mellitus
- Generalized malignancy*
- HIV infection*
- Hodgkin disease*
- Iatrogenic immunosuppression, including long-term systemic corticosteroids and radiation therapy*
- Leukemia*
- Lymphoma*
- Multiple myeloma*
- Nephrotic syndrome*
- Sickle cell disease or other hemoglobinopathies*
- Solid organ transplant*

* An immunocompromising condition

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.

https://www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf.

Adults 19–64 years old with chronic health conditions
Complete pneumococcal vaccine schedules

Prior vaccines	Option A	Option B
None*	**PCV20**	**PCV15** → ≥1 year → **PPSV23**
PPSV23 only	≥1 year → **PCV20**	≥1 year → **PCV15**
PCV13† only	≥1 year → **PCV20**	≥1 year → **PPSV23** Review pneumococcal vaccine recommendations again when your patient turns 65 years old.
PCV13† and PPSV23	**No vaccines** are recommended at this time. Review pneumococcal vaccine recommendations again when your patient turns 65 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
† Adults with chronic medical conditions were previously not recommended to receive PCV13

https://www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf.

Adults 19–64 years old with specified immunocompromising conditions
Complete pneumococcal vaccine schedules

Prior vaccines	Option A	Option B
None*	**PCV20**	**PCV15** → ≥8 weeks → **PPSV23**
PPSV23 only	≥1 year → **PCV20**	≥1 year → **PCV15**
PCV13 only	≥1 year → **PCV20**	≥8 weeks → **PPSV23** → ≥5 years → **PPSV23** Review pneumococcal vaccine recommendations again when your patient turns 65 years old.
PCV13 and **1 dose of PPSV23**	≥5 years → **PCV20**	≥5 years† → **PPSV23** Review pneumococcal vaccine recommendations again when your patient turns 65 years old.
PCV13 and **2 doses of PPSV23**	≥5 years → **PCV20**	**No vaccines** recommended at this time. Review pneumococcal vaccine recommendations again when your patient turns 65 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	

* Also applies to people who received PCV7 at any age and no other pneumococcal vaccines
† 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

https://www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf.

Adults 19–64 years old with a cochlear implant or cerebrospinal fluid leak
Complete pneumococcal vaccine schedules

Prior vaccines	Option A	Option B
None*	PCV20	PCV15 → ≥8 weeks → PPSV23
PPSV23 only	≥1 year → PCV20	≥1 year → PCV15
PCV13 only	≥1 year → PCV20	≥8 weeks → PPSV23 Review pneumococcal vaccine recommendations again when your patient turns 65 years old.
PCV13 and 1 dose of PPSV23	≥5 years → PCV20	**No vaccines** recommended at this time. Review pneumococcal vaccine recommendations again when your patient turns 65 years old.

* Also applies to people who received PCV7 at any age and no other pneumococcal vaccines

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Appendix

Appendix Recommended Adult Immunization Schedule, United States, 2023

Guide to Contraindications and Precautions to Commonly Used Vaccines

Adapted from Table 4-1 in Advisory Committee on Immunization Practices (ACIP) General Best Practice Guidelines for Immunization: Contraindication and Precautions available at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html and ACIP's Recommendations for the Prevention and Control of 2022-23 Seasonal Influenza with Vaccines available at www.cdc.gov/mmwr/volumes/71/rr/rr7101a1.htm

For COVID-19 vaccine contraindications and precautions see
www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html#contraindications

Vaccine	Contraindicated or Not Recommended[1]	Precautions[2]

RSV Vaccines for Older Adults and Pregnant Women on Horizon

Pending FDA and CDC vaccine advisory committee discussions on RSV vaccines

FDA meetings on RSV vaccines

- **May 18, 2023**
- "..discuss and make recommendations on the safety and effectiveness of ABRYSVO (Respiratory Syncytial Virus Vaccine), manufactured by Pfizer Inc., with a requested indication, in Biologics License Application (BLA) 125768 (STN 125768/0), for the prevention of lower respiratory tract disease and severe lower respiratory tract disease caused by RSV in infants from birth through 6 months of age by active immunization of pregnant individuals.
- **February 28-March 1, 2023**
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  - "..discuss and make recommendations on the safety and effectiveness of AREXVY (Respiratory Syncytial Virus Vaccine, Recombinant, Adjuvanted), manufactured by GSK, with a requested indication, in BLA 125775 (STN 125775/0), for active immunization for the prevention of LRTD caused by respiratory syncytial virus RSV-A and RSV-B subtypes in adults 60 years of age and older.
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CDC ACIP meeting June 21-23, 2023.

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	ABRYSVO (Pfizer)	AREXVY (GSK)
Type of vaccine	Lyophilized RSVpreF (fusion) protein; one intramuscular (IM) dose	Lyophilized RSVPreF3 protein+ASO1$_E$ adj. suspension; one IM dose
FDA approved indication	Adults 60 years and older	Adults 60 years and older
Study population for ongoing trials	Multi-country; N=>34,300 Could have stable HepB, HepC, HIV No immunocompromised Other vaccines ≥14 days before	Multi-country; N=24,966 Could have stable chronic conditions No immunocompromised or HIV Flu vx ≥ 14 days b/a. Other vx ≥30 days
Effectiveness definition and result	RSV+ LRTI 2+ symptoms = 66.7%(28.8,85.8) RSV+ LRTI 3+ symptoms = 85.7%(32.0,98.7)	RSV+ LRTI 2/3+ symptoms = 82.6%(57.9,94.1)
Safety – all AE, most common	Fatigue, injection site pain, redness, swelling, muscle/joint pain, headache	Injection site pain, fatigue, myalgia, headache, arthralgia, fever
Safety – serious AE	2.3% in placebo and vaccine grp. Afib in 10 vaccine, 4 placebo after 18-30 days.	4.0% in placebo, 4.2% in vaccine. Afib in 10 vaccine, 4 placebo after 1-30 days; 13 in vx and 15 placebo after 6 months.
Safety – severe AE*	Three possibly related to vaccine: GBS (Guillain-Barre' Syndrome), Miller Fisher Syndrome, hypersensitivity.	*Separate open-label Arexvy study (n=442) with coadministration with Fluarix reported 2 cases of acute disseminated encephalomyelitis. Immunogenicity study (n=1653): one case GBS.

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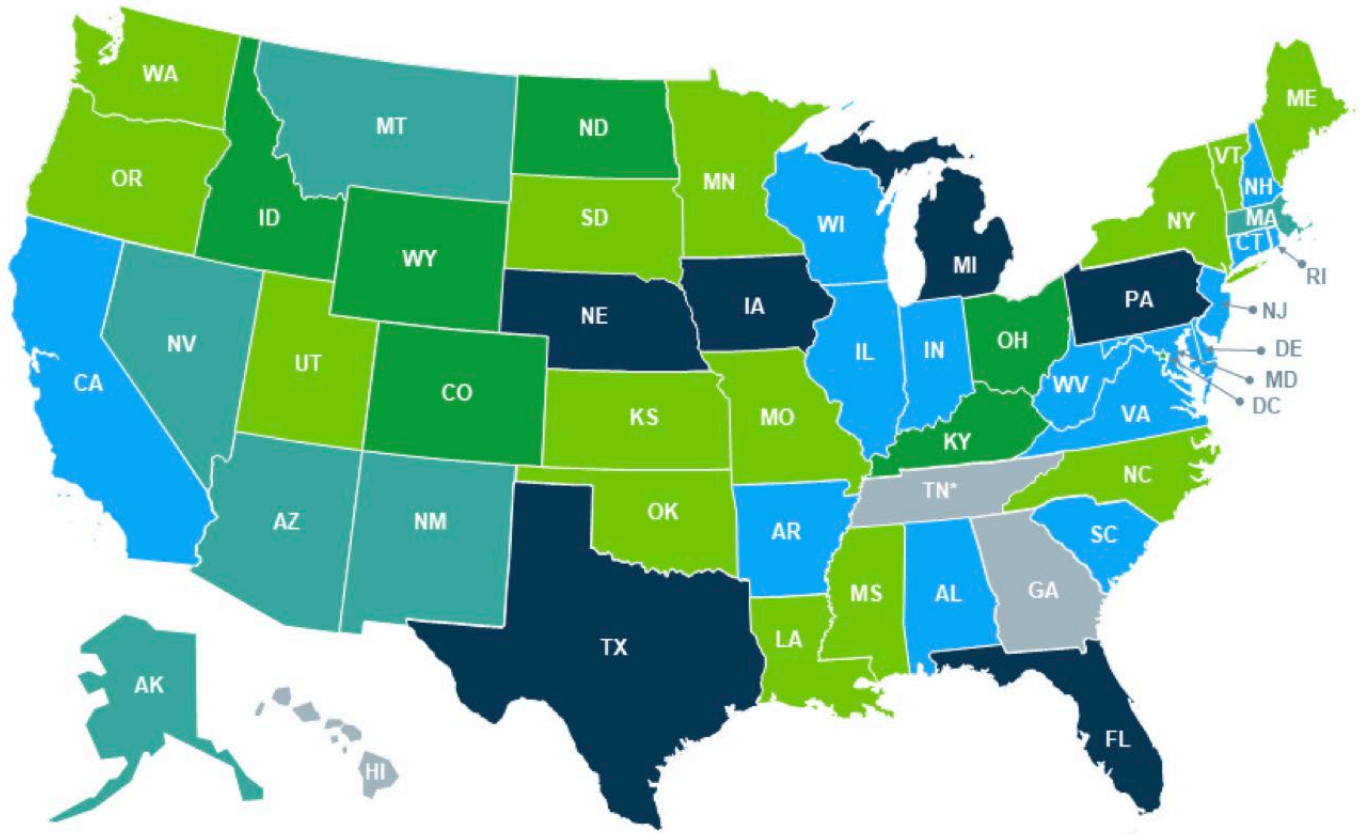
Medicaid FFS Provider Vaccine Administration Reimbursement, 2021 – Avalere

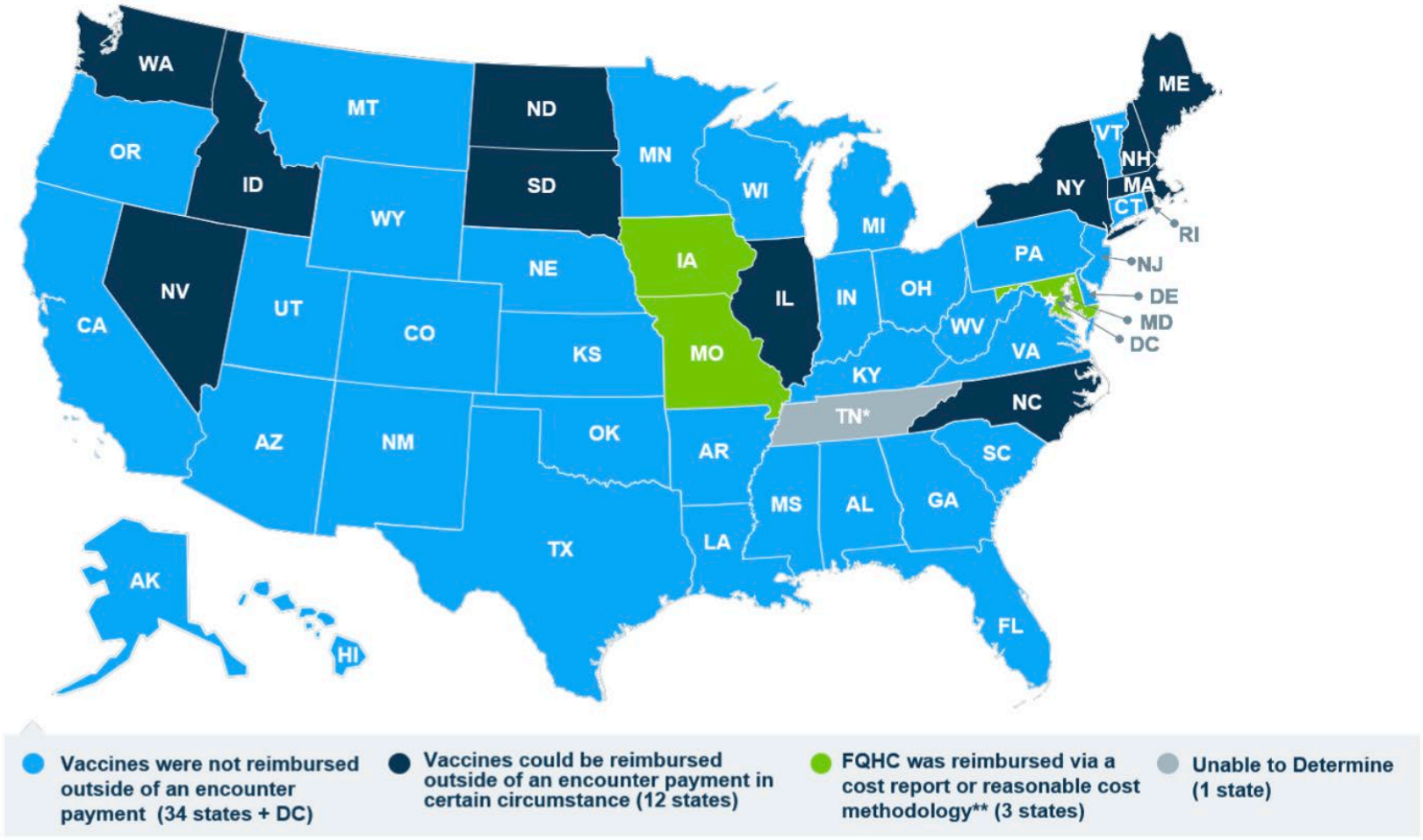
Figure 1: Medicaid FFS Physician Office Vaccine Administration Reimbursement, by State, 2021



https://avalere.com/wp-content/uploads/2023/04/Medicaid-Adult-Vaccine-Provider-Reimbursement-in-2021.pdf

Medicaid FFS FQHC Provider Vaccine Reimbursement, 2021 – Avalere

Figure 4: Medicaid FFS FQHC Vaccine Reimbursement Methodology, by State, 2021



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Factors Associated with Lower Adult Vaccination Rates

- Uninsured < Public insurance < Private insurance
- Lower income and lower education attainment
- Younger age
- Peer group/family less likely to be vaccinated
- Lower trust in government or health officials

- BUT – trusted messengers include personal physician, pharmacist, other providers, and trusted local community members such as pastors, and community-based organizations
- AND – integration and measuring of vaccination levels in practice does help raise rates

Vogelsang EM, Polonijo AN. Social Determinants of Shingles Vaccination in the United States. *The Journals of Gerontology*Volume 77, Issue 2, February 2022, Pages 407–412, https://doi.org/10.1093/geronb/gbab074
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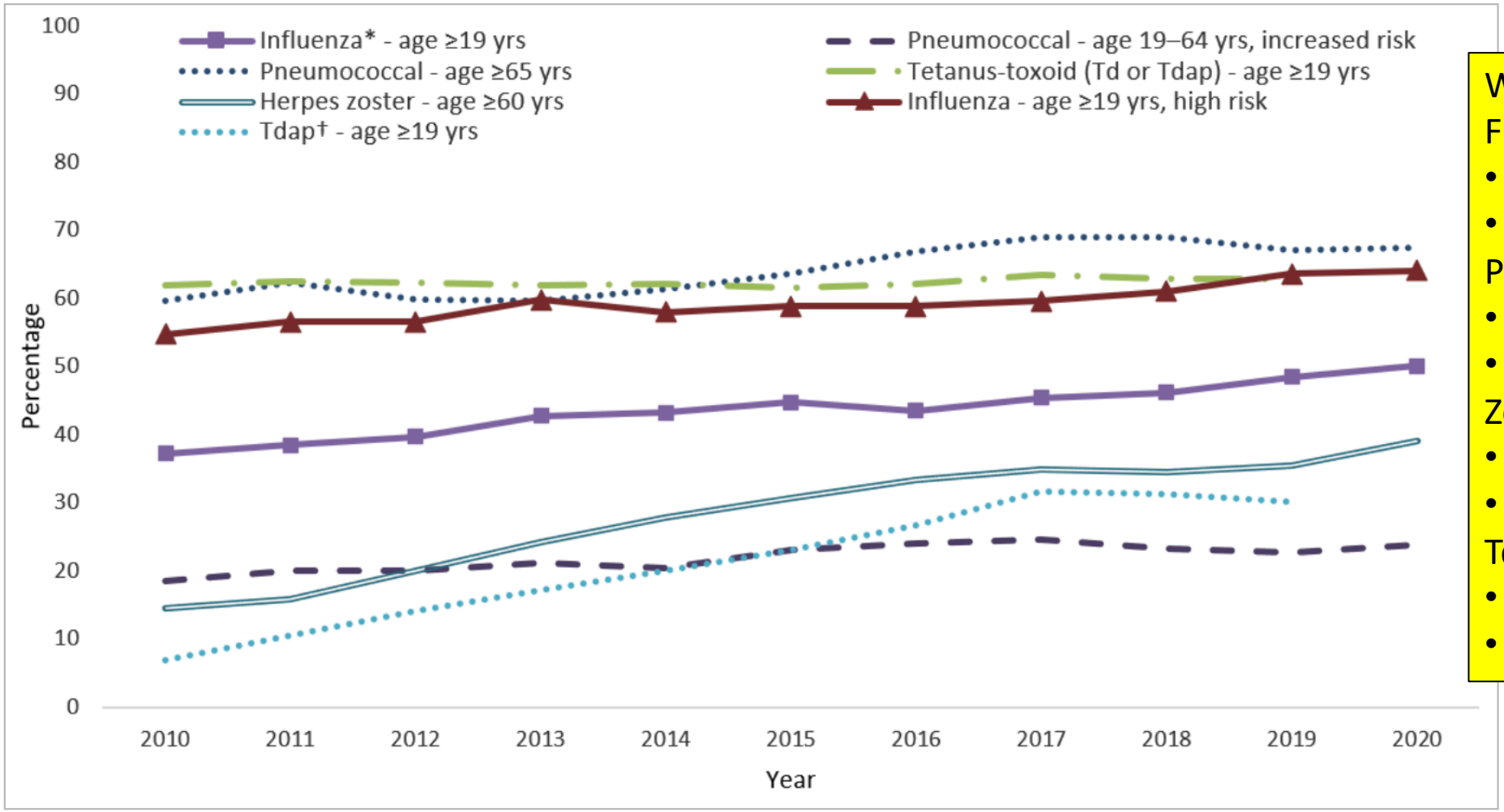
Bridges CB, et al. Meeting the challenges of immunizing adults. Am J Prev Med 2015.

FIGURE. Estimated proportion of adults aged ≥19 years who received selected vaccines, by age group and risk status — National Health Interview Survey, United States, 2010–2020



West Virginia BRFSS:
Flu (2021)
- 19-64 = 40.6%
- 65+ = 69.4%

Pneumo (2021)
- 19-64 HR = 32.1%
- 65+ = 72.0%

Zoster (2020)
- 60-64 = 24.6%
- 65+ = 44.8%

Td or Tdap (2019)
- 19+ = 71.7%
- 65+ = 59.5%

Abbreviations: Td = tetanus and diphtheria toxoids; Tdap = tetanus toxoid, reduced diphtheria toxoid,

https://www.cdc.gov/vaccines/imz-managers/coverage/adultvaxview/pubs-resources/vaccination-coverage-adults-2019-2020.html.

Recent Progress to Improving Adult Vaccination Implementation

- I.R.A. – Inflation Reduction Act
  - Requires no out-of-pocket costs for patients getting ACIP recommended vaccines for Medicare Part D vaccines and for persons on Medicaid
  - Prior to I.R.A., Affordable Care Act required private insurance to include coverage for all ACIP recommended vaccines on the adult schedule without cost sharing
- Improvements in reporting adult vaccination to immunization information systems due to COVID-19
- Two quality measures
  - Maternal immunization measure (Td/Tdap and influenza)
  - Adult composite measure (Td/Tdap, influenza, pneumococcal, zoster)

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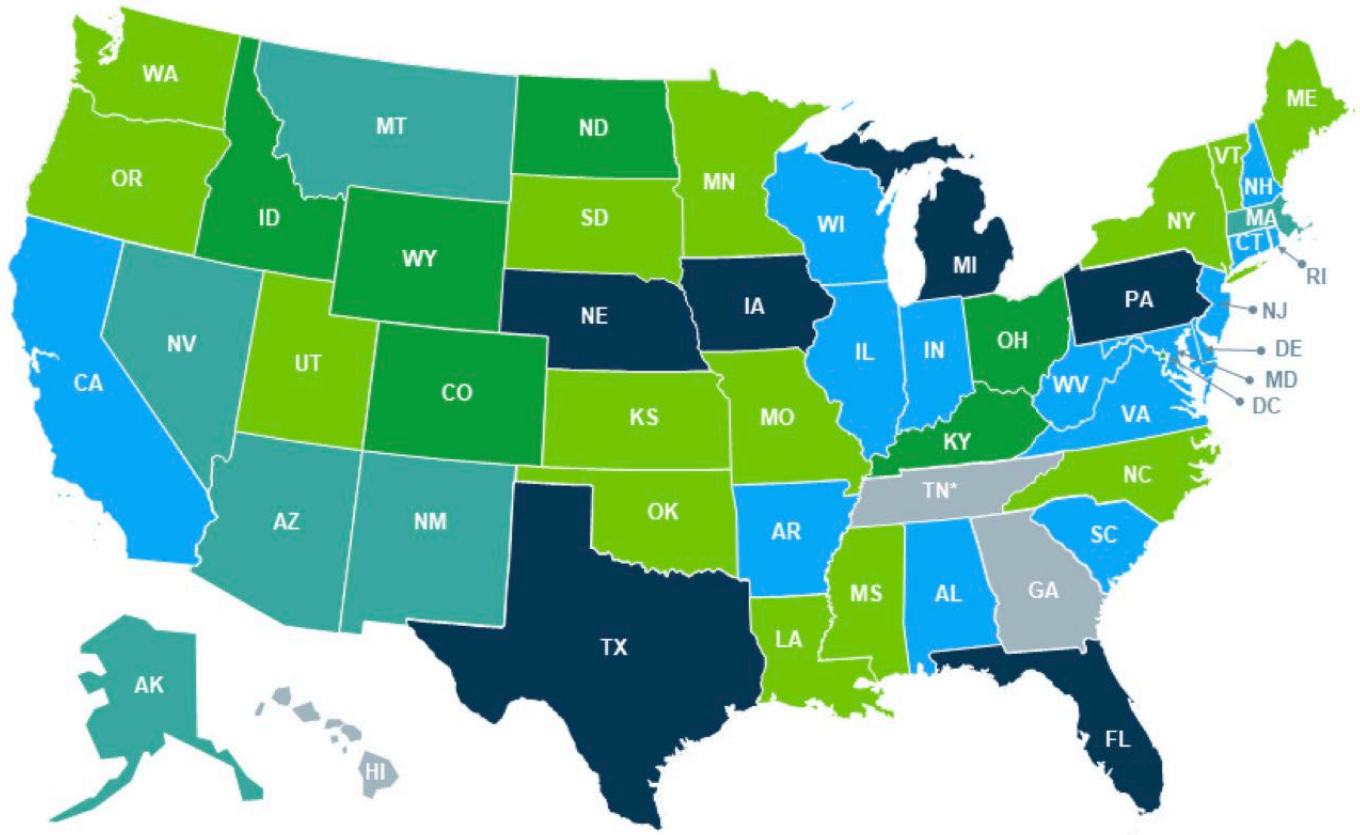

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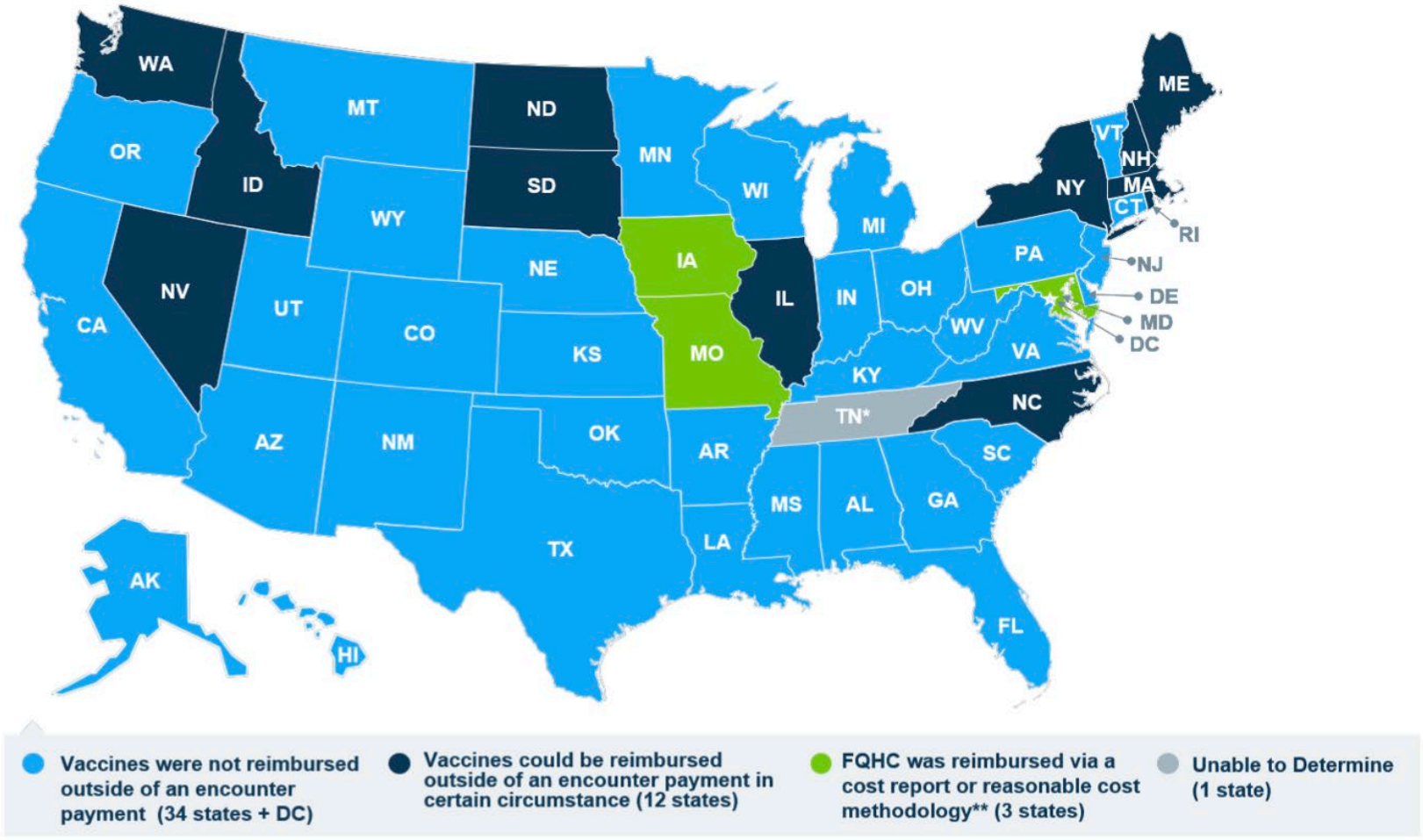

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Improving vaccine uptake long-game

- Successful organizations
  - Engage with communities and work with community trusted messengers
  - Listen
  - Get involved for long term
  - Develop trust relationships
  - Make vaccine information culturally appropriate and learn from the community about what they need
  - Make vaccines accessible, e.g., mobile clinics, after work hours,

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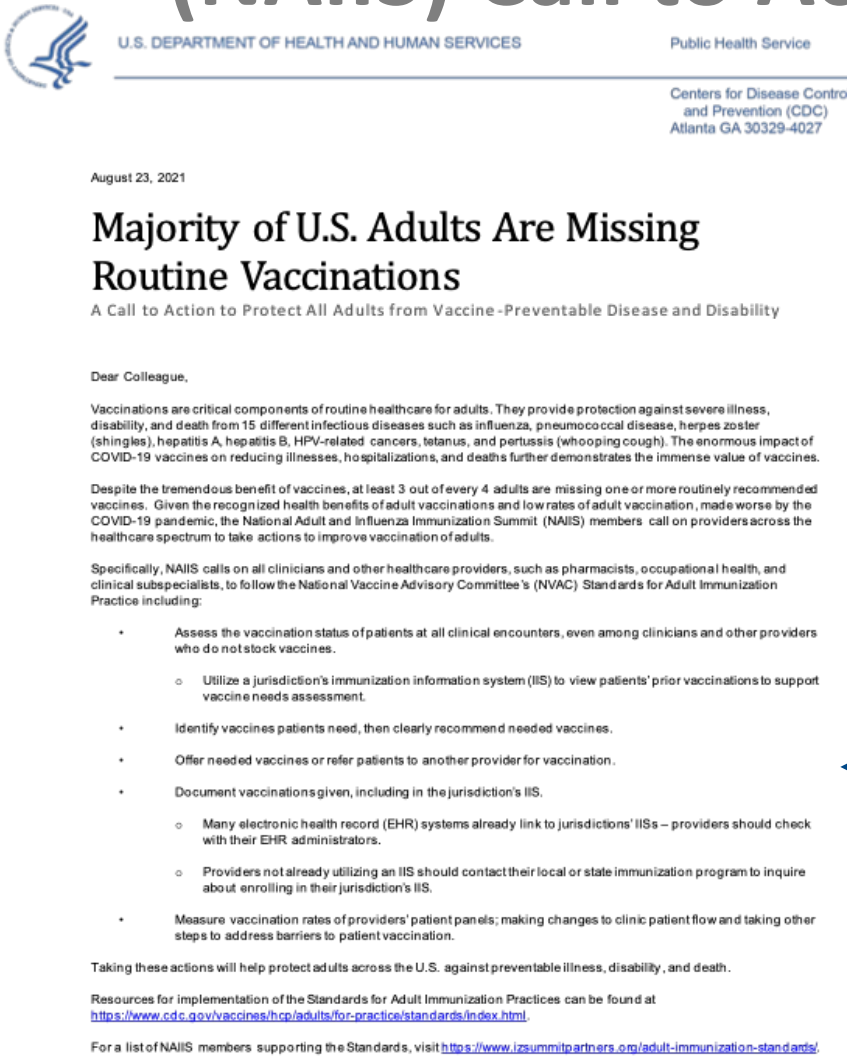
  - Requires no out-of-pocket costs for patients getting ACIP recommended vaccines for Medicare Part D vaccines and for persons on Medicaid
  - Prior to I.R.A., Affordable Care Act required private insurance to include coverage for all ACIP recommended vaccines on the adult schedule without cost sharing
- Improvements in reporting adult vaccination to immunization information systems due to COVID-19
- Two quality measures
  - Maternal immunization measure (Td/Tdap and influenza)
  - Adult composite measure (Td/Tdap, influenza, pneumococcal, zoster)

National Adult and Influenza Immunization Summit (NAIIS) Call to Action – 2021



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Public Health Service

Centers for Disease Control and Prevention (CDC)
Atlanta GA 30329-4027

August 23, 2021

Majority of U.S. Adults Are Missing Routine Vaccinations

A Call to Action to Protect All Adults from Vaccine-Preventable Disease and Disability

Dear Colleague,

Vaccinations are critical components of routine healthcare for adults. They provide protection against severe illness, disability, and death from 15 different infectious diseases such as influenza, pneumococcal disease, herpes zoster (shingles), hepatitis A, hepatitis B, HPV-related cancers, tetanus, and pertussis (whooping cough). The enormous impact of COVID-19 vaccines on reducing illnesses, hospitalizations, and deaths further demonstrates the immense value of vaccines.

Despite the tremendous benefit of vaccines, at least 3 out of every 4 adults are missing one or more routinely recommended vaccines. Given the recognized health benefits of adult vaccinations and low rates of adult vaccination, made worse by the COVID-19 pandemic, the National Adult and Influenza Immunization Summit (NAIIS) members call on providers across the healthcare spectrum to take actions to improve vaccination of adults.

Specifically, NAIIS calls on all clinicians and other healthcare providers, such as pharmacists, occupational health, and clinical subspecialists, to follow the National Vaccine Advisory Committee's (NVAC) Standards for Adult Immunization Practice including:

- Assess the vaccination status of patients at all clinical encounters, even among clinicians and other providers who do not stock vaccines.
  - Utilize a jurisdiction's immunization information system (IIS) to view patients' prior vaccinations to support vaccine needs assessment.
- Identify vaccines patients need, then clearly recommend needed vaccines.
- Offer needed vaccines or refer patients to another provider for vaccination.
- Document vaccinations given, including in the jurisdiction's IIS.
  - Many electronic health record (EHR) systems already link to jurisdictions' IISs – providers should check with their EHR administrators.
  - Providers not already utilizing an IIS should contact their local or state immunization program to inquire about enrolling in their jurisdiction's IIS.
- Measure vaccination rates of providers' patient panels; making changes to clinic patient flow and taking other steps to address barriers to patient vaccination.

Taking these actions will help protect adults across the U.S. against preventable illness, disability, and death.

Resources for implementation of the Standards for Adult Immunization Practices can be found at https://www.cdc.gov/vaccines/hcp/adults/for-practice/standards/index.html.

For a list of NAIIS members supporting the Standards, visit https://www.izsummitpartners.org/adult-immunization-standards/.

Standards for Adult Immunization Practice

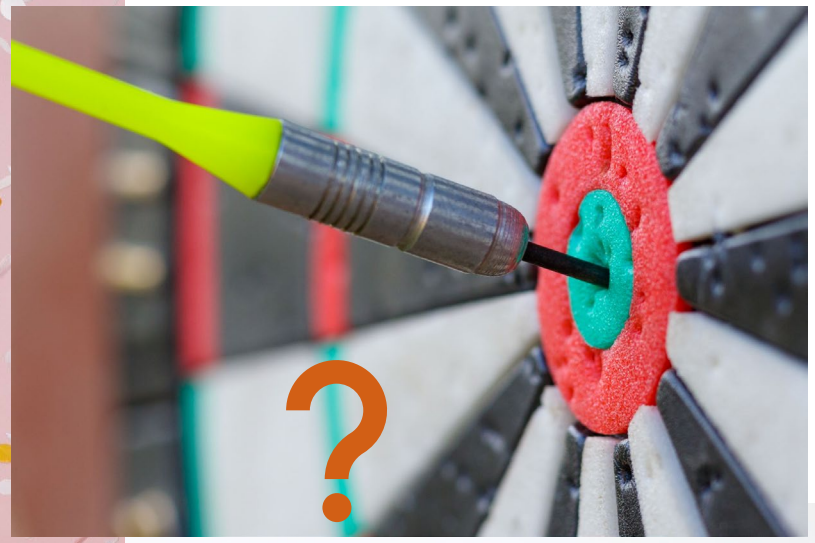
- **Assess** the vaccination status of patients at all clinical encounters
- **Identify** vaccines patients need, then clearly **recommend** needed vaccines.
- **Offer** needed vaccines or refer patients to another provider for vaccination.
- **Document** vaccinations given.
- ***Measure** vaccination rates of providers' patient panels.

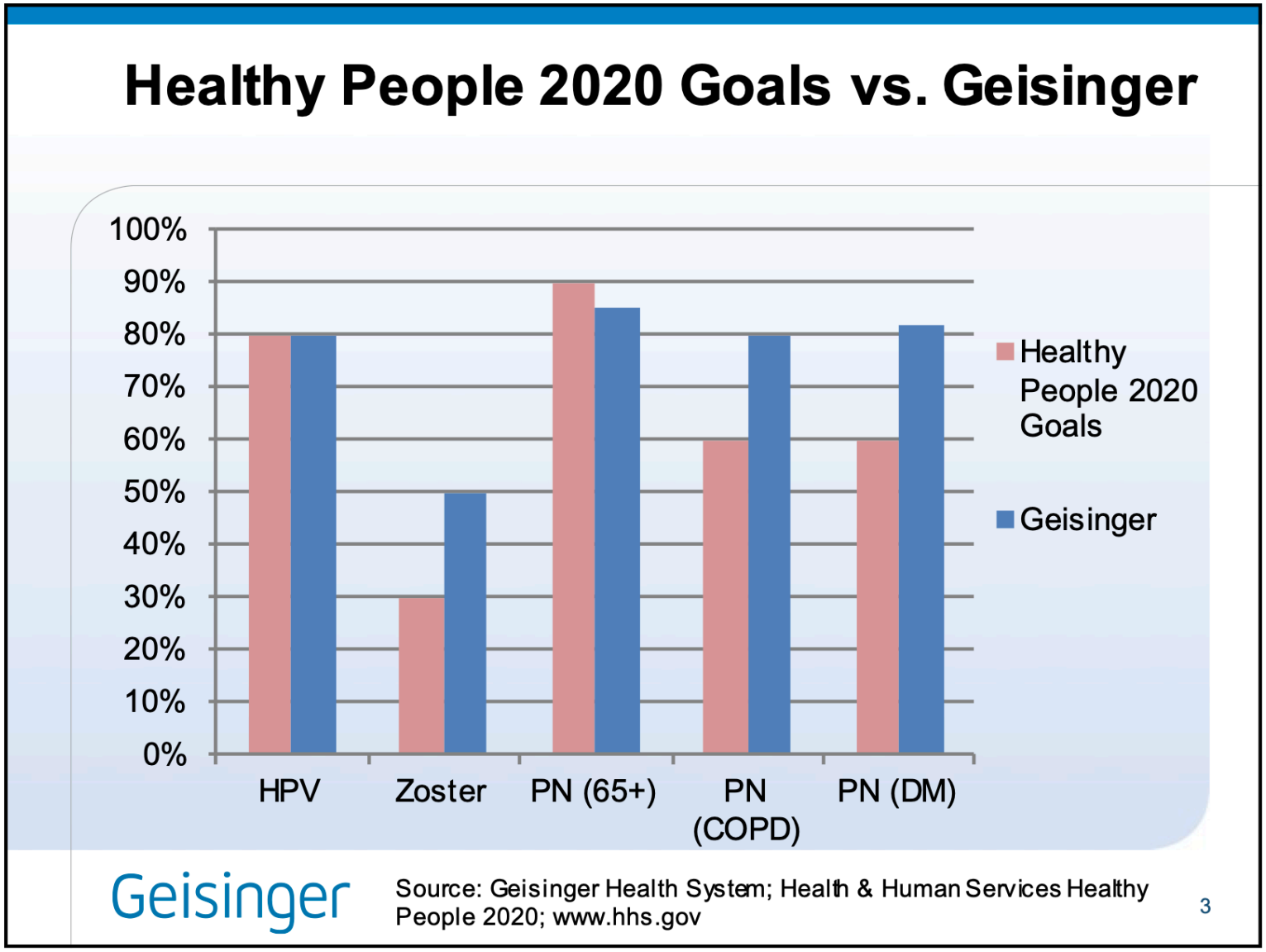
https://www.cdc.gov/vaccines/hcp/adults/for-practice/increasing-vacc-rates.html
https://www.izsummitpartners.org/call-to-action-adult-immunizations/.

Evidence-based Strategies to Improve Adult Vaccination Rates

- Patient reminders/recall (includes text messaging, emails, etc.)
- Provider reminders
- Provider assessment and feedback
- Use of immunization information systems
- Standing orders
- Health Care System-Based and Community-based Interventions Implemented in Combination
  - Increase demand and access to vaccines
- Providing vaccinations and counseling in WIC settings
- Home visits and other ways to increase vaccine access

https://health.gov/healthypeople/objectives-and-data/browse-objectives/infectious-disease/evidence-based-resources



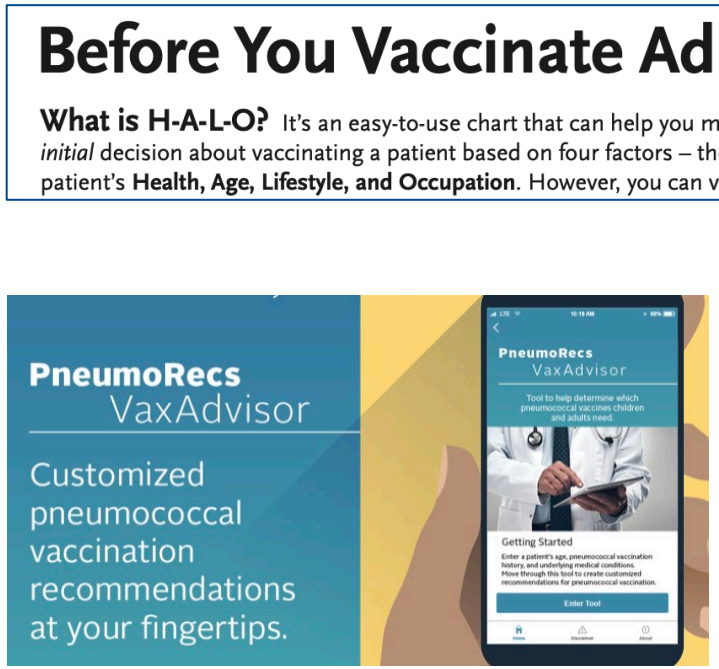


Courtesy Dr. John Bulger, Geisinger Health, System, Presented to National Adult and Influenza Immunization Summit May 2016

https://www.izsummitpartners.org/summit/archive/2016-naiis/.

Resources and tools

- CDC – Online quiz, adult schedules, links to helpful apps. https://www.cdc.gov/vaccines/hcp/adults/index.html.
- Immunize.org – standing orders for all vaccines, H-A-L-O and other checklists, information for patients, information for vaccinators and policy issues. www.immunize.org.
- National Adult and Influenza Immunization Summit partners – resources for providers, including billing and coding, plus frequent webinars on priority adult vaccine and influenza issues. www.lzsummitpartners.or
- AMA – Adult immunization: Team-based vaccination https://edhub.ama-assn.org/steps-forward/module/2702553



Before You Vaccinate Adults, Consider Their "H-A-L-O"!

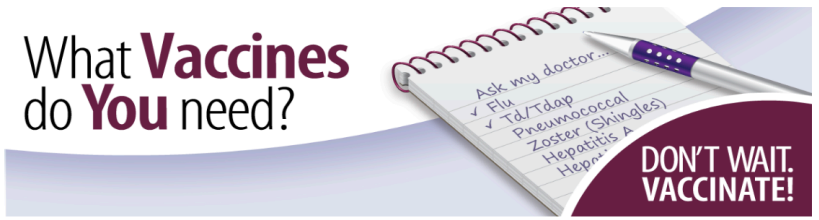
What is H-A-L-O? It's an easy-to-use chart that can help you make an *initial* decision about vaccinating a patient based on four factors – the patient's **Health, Age, Lifestyle, and Occupation**. However, you can vaccinate

Not all patients who mention one or more **H-A-L-O** factors will need to be vaccinated. Before you make a *definitive* decision about vaccinating your patient, you should refer to the more detailed information found in Immu-

https://www.immunize.org/catg.d/p3070.pdf.

The Adult Vaccine Assessment Tool

Español (Spanish) | Print



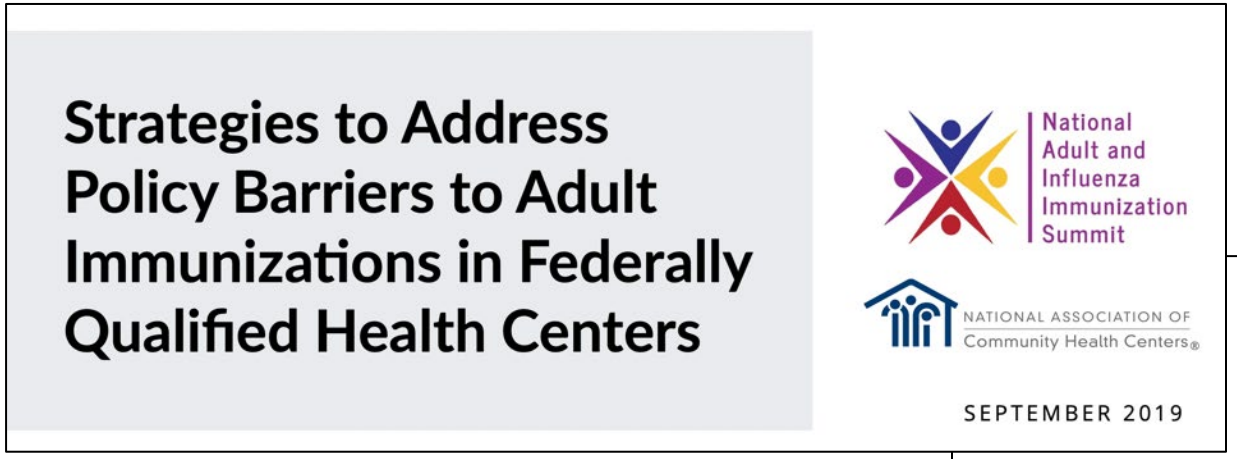
Adults need vaccines too! Answer a few quick questions to find out which vaccines you may need.

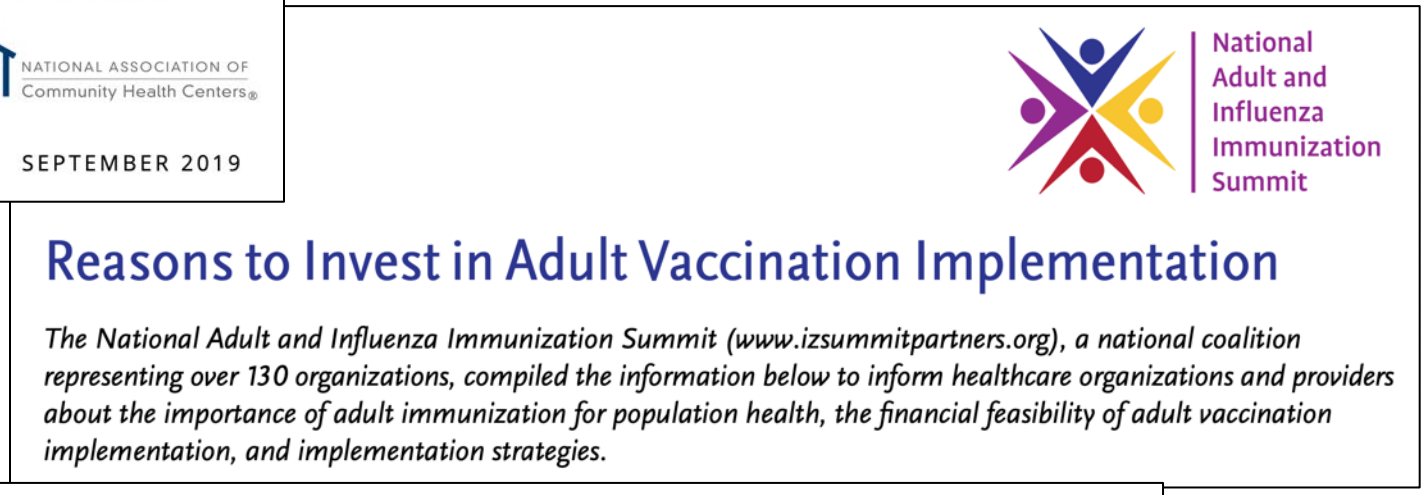
CDC Vaccine Schedules App for Healthcare Providers

CDC VACCINE SCHEDULES

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

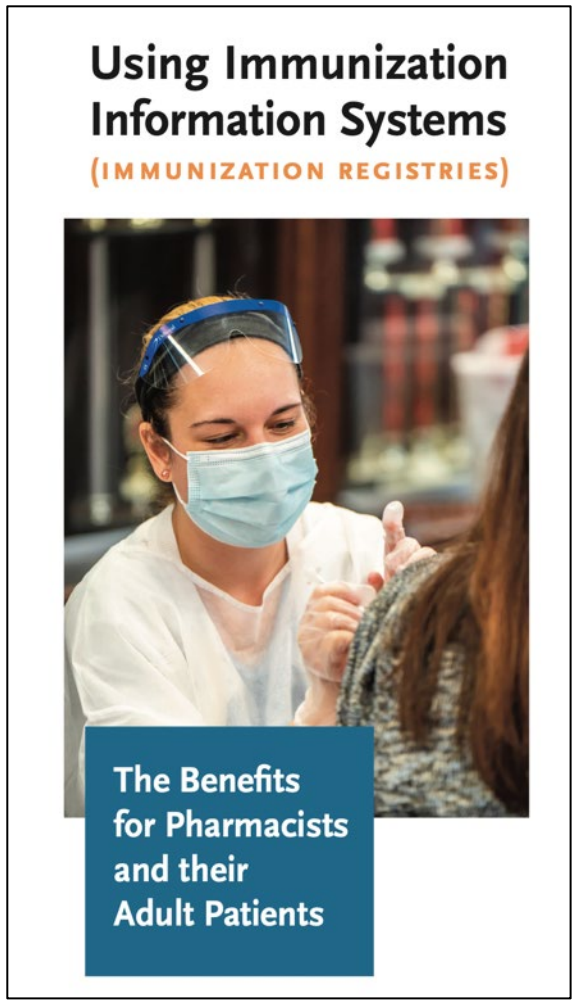
Addressing potential financial and other barriers for patients and providers

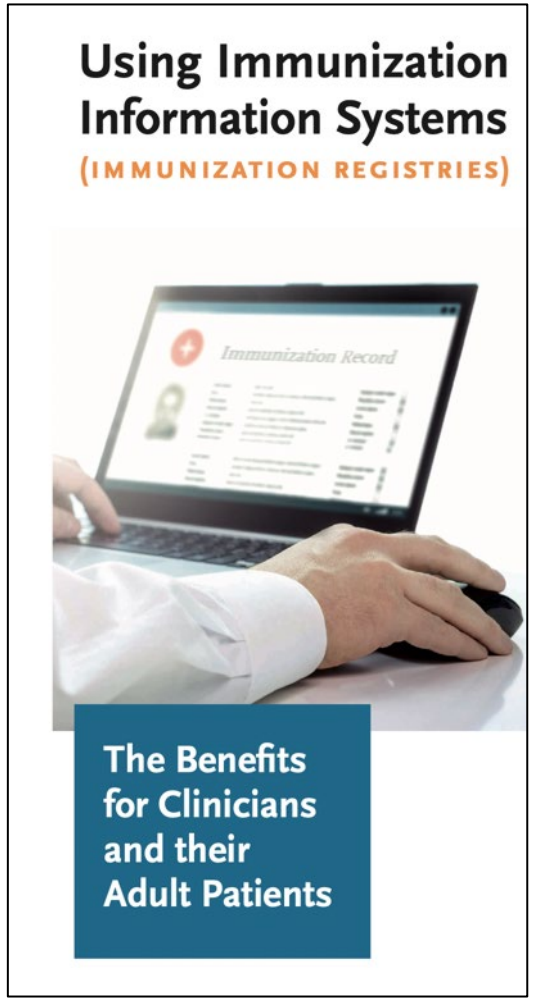




https://www.izsummitpartners.org/naiis-workgroups/access-provider-workgroup/.

National Adult and Influenza Immunization Summit developed resources





Get Adults' Vaccinations Back on Track

Tip sheet for providers on new CDC adult vaccine recommendations and tools to help adults catch up on needed vaccinations

National Adult and Influenza Immunization Summit

At least 3 out of every 4 adults are behind on routine vaccines like influenza (flu), tetanus (Td/Tdap), hepatitis A, and HPV. In addition, COVID-19 vaccine recommendations continue to evolve, and new changes were made to hepatitis B, shingles, pneumococcal, and flu vaccine recommendations since 2021.

VACCINE	NEW RECOMMENDATION	BRAND NAME(S)	DOSING
Hepatitis B	Everyone 19-59 years. ≥60 years who want vaccination or have high-risk indication.	Engerix-B, Twinrix, PreHevbrio, Heplisav-B	2- or 3-dose series depending on brand
Zoster (shingles)	Everyone ≥50 years. ≥19 years immunocompromised.	Shingrix	2-dose series
Pneumococcal	Everyone ≥65 years. ≥19 years immunocompromised or high-risk medical condition.	Vaxneuvance(PCV15), Prevnar20 (PCV20), Pneumovax 23 (PPSV23)	Either PCV15 then PPSV23 one year later or one dose PCV20
Preferred flu vaccines for adults ≥65 years	≥65 years: give flu vaccines preferred by CDC for this age group. If not available, give any age-appropriate flu vaccine.	Fluad (adjuvanted), Fluzone High-Dose (inactivated), or Flublok (recombinant)	Annual vaccination

https://www.izsummitpartners.org/benefits-of-iis-brochures/

Thank you

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