

# Vaccinations across the lifespan

An introduction to the  
routinely recommended  
adult vaccines

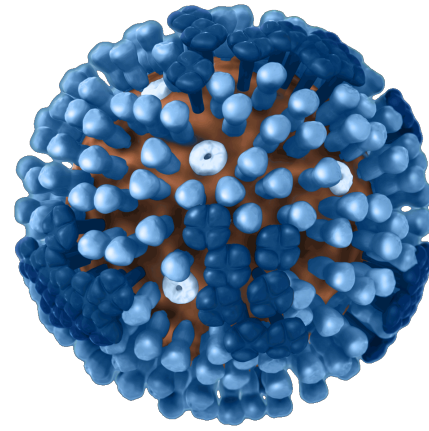
Neil Chandra Murthy, MD, MPH, MSJ  
LCDR, U.S. Public Health Service

December 1, 2022





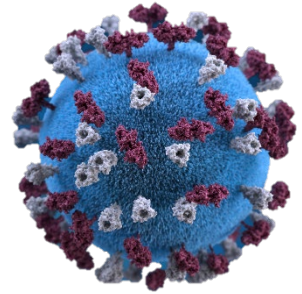
Pertussis



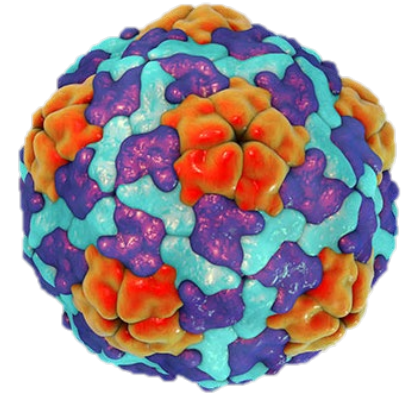
Influenza



Pneumonia



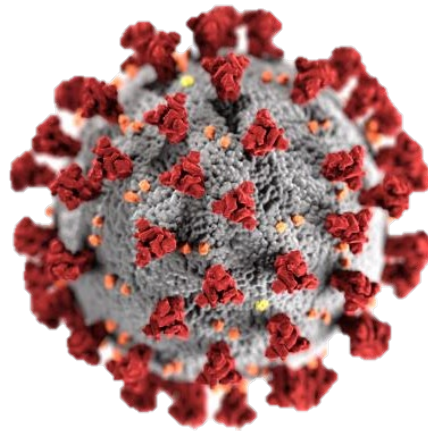
Measles



Hepatitis A



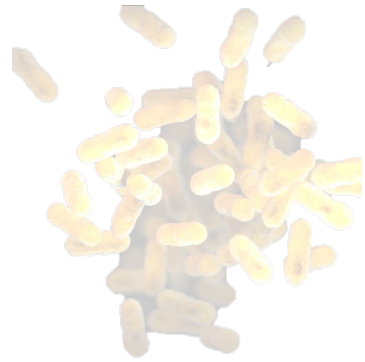
Diphtheria



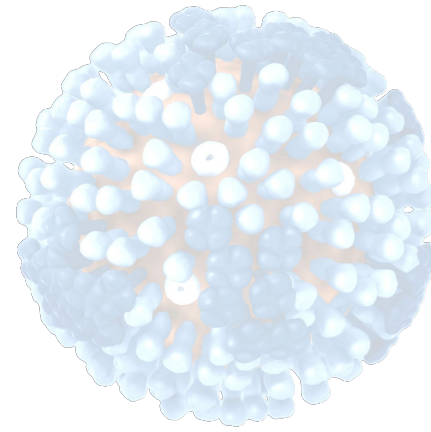
COVID-19



Meningitis



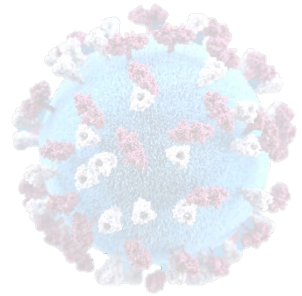
Pertussis



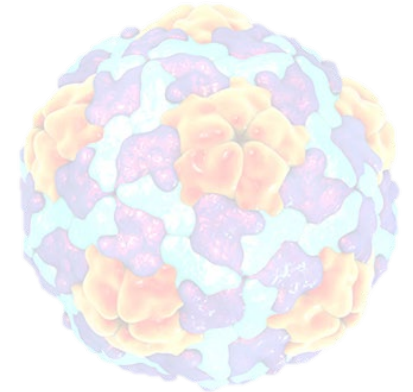
Influenza



Pneumonia



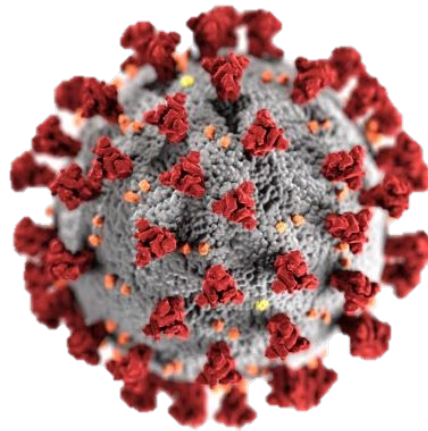
Measles



Hepatitis A



Diphtheria



COVID-19



Meningitis







- Learn basic facts about vaccine preventable diseases
- Recognize key populations who may need certain vaccines
- Understand how vaccines are important throughout a person's life



## This presentation does NOT cover:

- Dosing schedules or regimens
- Trade names of vaccines
- Vaccines recommended for travel
- All nuances of certain medical conditions that may warrant vaccines
- Best practices to encourage vaccine uptake
- Details in the 2023 Adult Immunization Schedule

# Recommended Adult Immunization Schedule for ages 19 years or older

UNITED STATES  
**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, frequencies, 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](http://www.cdc.gov/vaccines/acip)) and approved by the Centers for Disease Control and Prevention ([www.cdc.gov](http://www.cdc.gov)), American College of Physicians ([www.acponline.org](http://www.acponline.org)), American Academy of Family Physicians ([www.aafp.org](http://www.aafp.org)), American College of Obstetricians and Gynecologists ([www.acog.org](http://www.acog.org)), American College of Nurse-Midwives ([www.midwife.org](http://www.midwife.org)), American Academy of Physician Associates ([www.aapa.org](http://www.aapa.org)), American Pharmacists Association ([www.pharmacist.com](http://www.pharmacist.com)), and Society for Healthcare Epidemiology of America ([www.shea-online.org](http://www.shea-online.org)).

### Vaccines in the Adult Immunization Schedule\*

Vaccine	Abbreviation(s)	Trade name(s)
COVID-19 vaccine	1vCOV-mRNA	Comirnaty <sup>®</sup> /Pfizer-BioNTech Spikevax <sup>®</sup> /Moderna
<i>Haemophilus influenzae</i> type b vaccine	IPV	Flucelvax <sup>®</sup>
Hepatitis A vaccine	1vA	Heplisax-A <sup>®</sup>
Hepatitis A and hepatitis B vaccine	1vAB	Heplisax-AB <sup>®</sup>
Hepatitis B vaccine	1vB	Heplisax-B <sup>®</sup>
Human papillomavirus vaccine	1vHPV	Gardasil 9 <sup>®</sup>
Influenza vaccine (inactivated)	1vIIV	Flucelvax <sup>®</sup>
Influenza vaccine (live, attenuated)	1vLIV	Fluad <sup>®</sup>
Influenza vaccine (recombinant)	1vRIV	Flucelvax <sup>®</sup>
Measles, mumps, and rubella vaccine	1vMMR	M-M-R II <sup>®</sup>
Meningococcal serogroups A, C, W, Y vaccine	MenACWY	Menactra <sup>®</sup> Menveo <sup>®</sup>
Meningococcal serogroup B vaccine	MenB	MenQuadfi <sup>®</sup> Bexsero <sup>®</sup>
Pneumococcal conjugate vaccine	PCV15	Vaxneuvance <sup>™</sup>
Pneumococcal polysaccharide vaccine	PPSV23	Pneumovax 23 <sup>®</sup>
Poliovirus vaccine	IPV	IPOL <sup>®</sup>
Tetanus and diphtheria toxoids	Td	Tenivac <sup>®</sup> Tdvax <sup>™</sup>
Tetanus and diphtheria toxoids and acellular pertussis vaccine	Tdap	Adacel <sup>®</sup> Boostrix <sup>®</sup>
Varicella vaccine	VAR	Varivax <sup>®</sup>
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

Report vaccine adverse events or outbreaks to the Vaccine Adverse Event Reporting System (VAERS) ([www.vaers.hhs.gov](http://www.vaers.hhs.gov)) except PPSV23, RZV, and the Injury Compensation Program (ICCP). For more information, visit [www.hrsa.gov/cicp](http://www.hrsa.gov/cicp). For more information, visit [www.cdc.gov/vaccines/schedules/hcp/schedule-app.html](http://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](http://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](http://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html)
- Vaccine information statements: [www.cdc.gov/vaccines/hcp/vis/index.html](http://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](http://www.cdc.gov/vaccines/pubs/surv-manual)
- Travel vaccine recommendations: [www.cdc.gov/travel](http://www.cdc.gov/travel)
- Recommended Child and Adolescent Immunization Schedule, United States, 2023: [www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html](http://www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html)
- ACIP Shared Clinical Decision-Making Recommendations: [www.cdc.gov/vaccines/acip/acip-scdm-faqs.html](http://www.cdc.gov/vaccines/acip/acip-scdm-faqs.html)



U.S. Department of  
Health and Human Services  
Centers for Disease  
Control and Prevention

Scan QR code  
for access to  
online schedule



CS310021-A





Vaccines recommended for EVERYONE based on AGE



19-26 years



27-49 years



50-64 years



65+ years



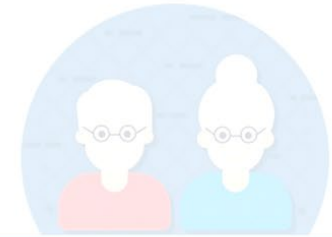
19-26 years



27-49 years

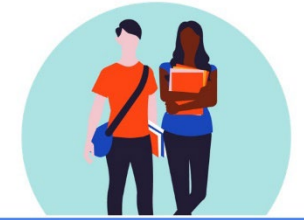


50-64 years



65+ years

# Vaccines recommended for EVERYONE



19-26 years

Influenza

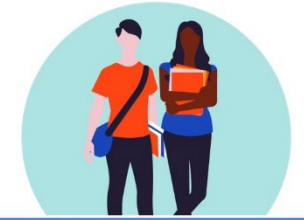
Tdap

HPV

Hepatitis B

COVID-19

# Vaccines recommended for EVERYONE



19-26 years

Influenza

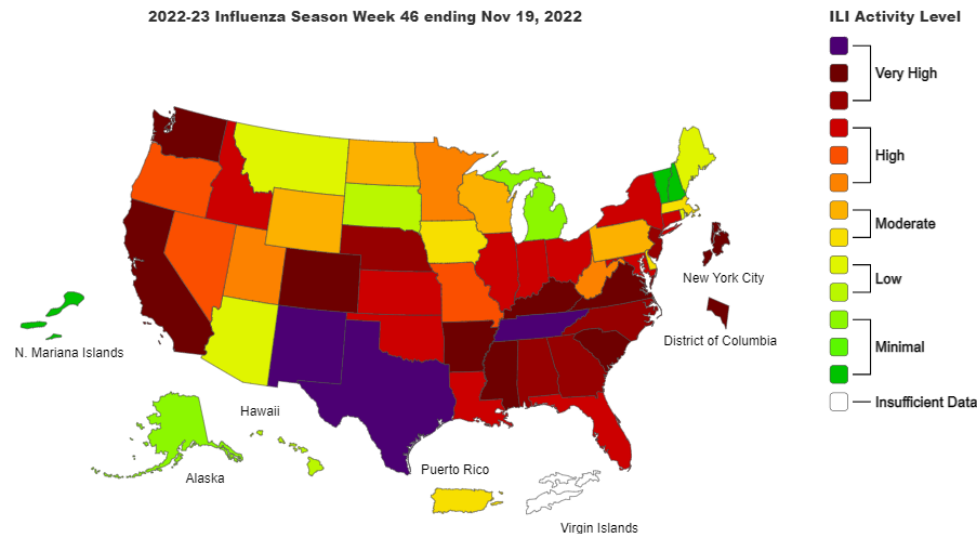
Tdap

HPV

Hepatitis B

COVID-19

- Administer once EVERY YEAR
- Multiple types of flu vaccines:
  - Quadrivalent inactivated influenza vaccine [IIV4]
  - Recombinant influenza vaccine [RIV4]
  - Live attenuated influenza vaccine (LAIV4)

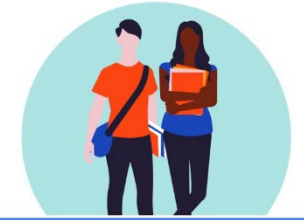


Deaths  
12,000-52,000

Hospitalizations  
140,000-710,000

Illnesses  
9,000,000-41,000,000

# Vaccines recommended for EVERYONE



19-26 years

Influenza

Tdap

HPV

Hepatitis B

COVID-19

- Combination vaccine of Tetanus, Diphtheria, and Pertussis

Tetanus "Lockjaw"



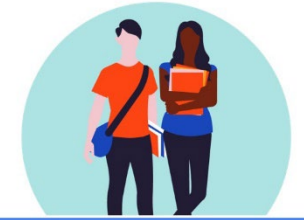
Diphtheria



Pertussis  
"Whooping Cough"



# Vaccines recommended for EVERYONE



19-26 years

Influenza

Tdap

HPV

Hepatitis B

COVID-19

- Combination vaccine of Tetanus, Diphtheria, and Pertussis

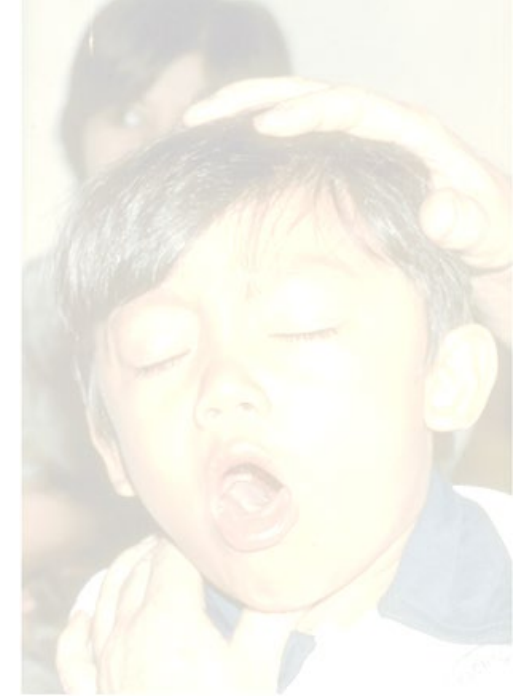
Tetanus “Lockjaw”



Diphtheria

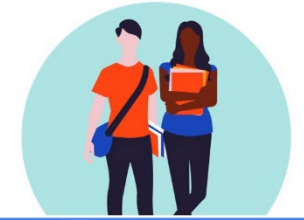


Pertussis  
“Whooping Cough”





# Vaccines recommended for EVERYONE



19-26 years

Influenza

Tdap

HPV

Hepatitis B

COVID-19

- Combination vaccine of Tetanus, Diphtheria, and Pertussis

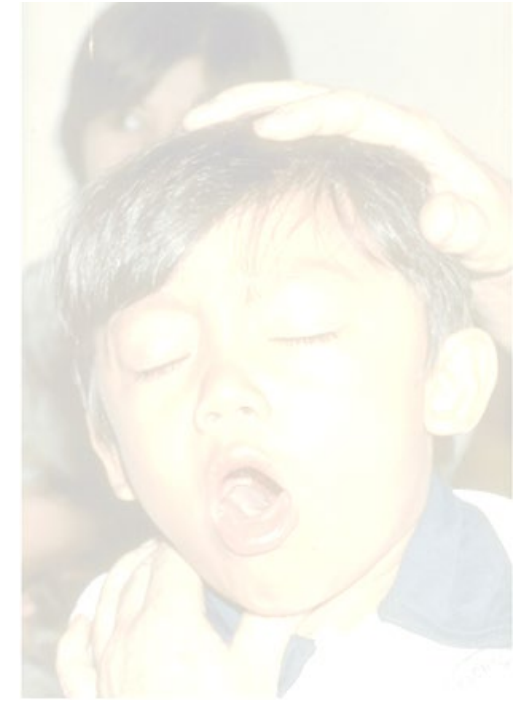
Tetanus "Lockjaw"



Diphtheria



Pertussis  
"Whooping Cough"



# Vaccines recommended for EVERYONE



19-26 years

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Hepatitis B

COVID-19

- Combination vaccine of Tetanus, Diphtheria, and Pertussis

Tetanus "Lockjaw"



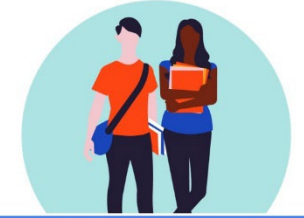
Diphtheria



Pertussis  
"Whooping Cough"



# Vaccines recommended for EVERYONE



19-26 years

Influenza

Tdap

HPV

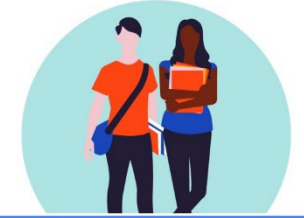
Hepatitis B

COVID-19

- Combination vaccine of Tetanus, Diphtheria, and Pertussis
- Administer Td or Tdap once EVERY 10 YEARS
- May need to administer Td or Tdap for a “dirty wound”
- Administer 1 Tdap during 3<sup>rd</sup> trimester of each pregnancy



# Vaccines recommended for EVERYONE



19-26 years

Influenza

Tdap

HPV

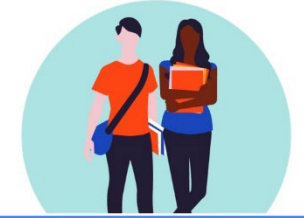
Hepatitis B

COVID-19

- Human Papillomavirus. Very common, sexually transmitted disease that can lead to cervical, penile, anal, vulvar, vaginal, and throat cancer.
- Everyone up through age 26 years needs to be vaccinated!
- HPV vaccines can prevent over 90% of these cancers!
- Preteens should be vaccinated! Number of doses needed depends on age when they started the series, or if they have any medical conditions.
- General rule of thumb:
  - 2 dose series if started at age 9-14 years
  - 3 dose series if started at 15 years or older



# Vaccines recommended for EVERYONE



19-26 years

Influenza

Tdap

HPV

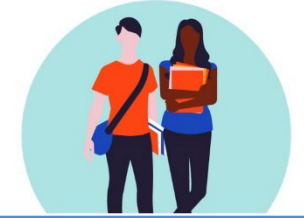
Hepatitis B

COVID-19

- Causes chronic liver infection, liver failure, and liver cancer
- Causes up to 80% of liver cancers
- Recommended for all adults up through age 59 years
- Multiple types and dosing regimens of Hepatitis B vaccines



# Vaccines recommended for EVERYONE



19-26 years

Influenza

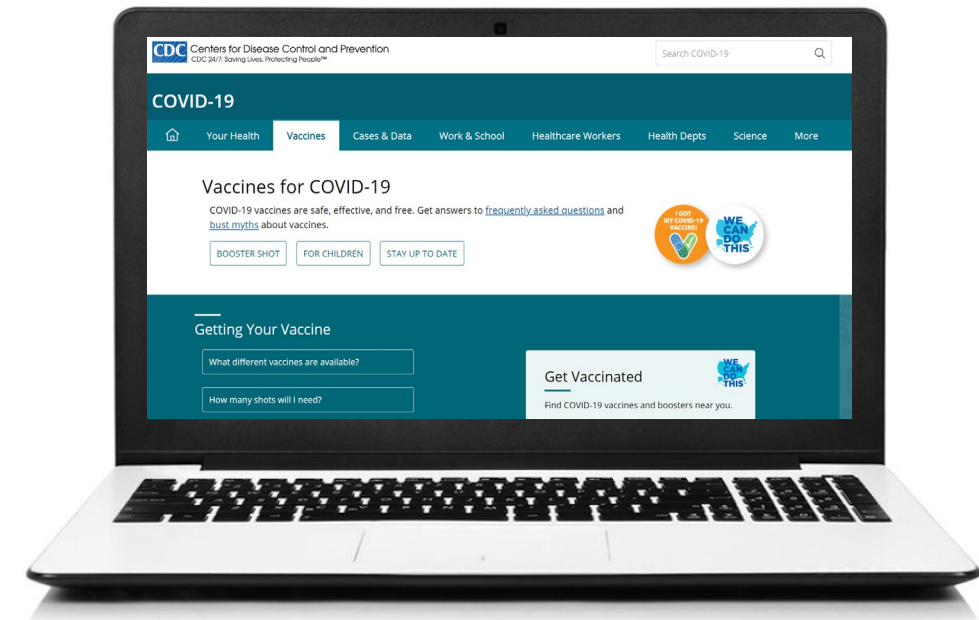
Tdap

HPV

Hepatitis B

COVID-19

- Recommended for all persons 6 months of age and older
- Primary series:
  - 2-dose series at 0, 4-8 weeks (Moderna)
  - 2-dose series at 0, 3-8 weeks (Novavax, Pfizer-BioNTech)
- Stay up-to-date on vaccines!





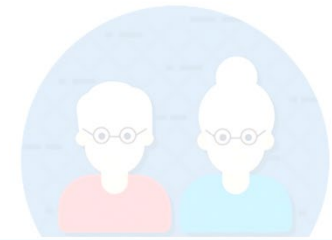
19-26 years



27-49 years



50-64 years



65+ years

# Vaccines recommended for EVERYONE



27-49 years

Influenza

Tdap

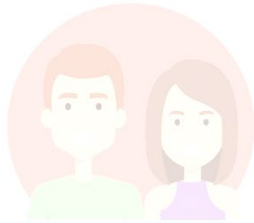
Hepatitis B

COVID-19





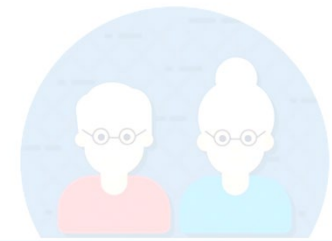
19-26 years



27-49 years



50-64 years



65+ years

# Vaccines recommended for EVERYONE

Influenza

Tdap

Hepatitis B\*

COVID-19

Zoster



50-64 years

# Vaccines recommended for EVERYONE



50-64 years

Influenza

- Recommended for all adults up through age 59 years
- Risk-based recommendations for adults 60 years of age and older

Tdap

Hepatitis B\*

COVID-19

Zoster



# Vaccines recommended for EVERYONE



50-64 years

Influenza

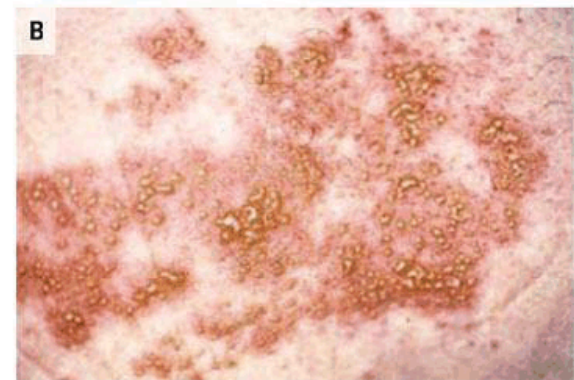
- Recommended for all adults 50 years of age or older
- Reactivation of the virus that causes chickenpox, causing a painful skin rash. Can develop nerve pain that lasts for months or years, called postherpetic neuralgia.
- 1 out of 3 people in the United States will develop shingles!

Tdap

Hepatitis B\*

COVID-19

Zoster





19-26 years



27-49 years



50-64 years



65+ years

# Vaccines recommended for EVERYONE

Influenza

Tdap

COVID-19

Zoster

Pneumococcal



65+ years

# Vaccines recommended for EVERYONE



65+ years

Influenza

Tdap

COVID-19

Zoster

Pneumococcal

- Recommended for all adults 65 years of age or older
- Caused by a bacteria called *streptococcus pneumoniae*. Can cause multiple infections:
  - Pneumonia: Lung infection
  - Bacteremia: Blood infection
  - Sinusitis: Sinus infection
  - Meningitis: Infection of the lining of the brain and spinal cord
  - Otitis media: Ear infection
- Spreads via respiratory secretions, like saliva or mucus
- Pneumococcal pneumonia causes **150,000 hospitalizations**. Pneumococcal meningitis and bacteremia kills more than **3,000 people**.

# Vaccines recommended for EVERYONE



65+ years

Influenza

Tdap

COVID-19

Zoster

Pneumococcal

- High dose or adjuvanted influenza vaccines are preferred
  - Quadrivalent high-dose inactivated influenza vaccine (HD-IIV4)
  - Quadrivalent recombinant influenza vaccine (RIV4)
  - Quadrivalent adjuvanted inactivated influenza vaccine (aIIV4)
- If none of these vaccines is available, any other age-appropriate influenza vaccine should be used



Vaccines recommended for SOME based on certain conditions

# Vaccines recommended for SOME



19-26 years



27-49 years



50-64 years

MMR

Varicella

Zoster

HPV

Pneumococcal

Hepatitis A

Hepatitis B

Meningococcal

Hib

- Live vaccine. Protects against Measles, Mumps and Rubella.

Measles



Mumps



Rubella



# Vaccines recommended for SOME



19-26 years



27-49 years



50-64 years

MMR

Varicella

Zoster

HPV

Pneumococcal

Hepatitis A

Hepatitis B

Meningococcal

Hib

- Live vaccine. Protects against Measles, Mumps and Rubella.

Measles



Mumps



Rubella



# Vaccines recommended for SOME



19-26 years



27-49 years



50-64 years

MMR

Varicella

Zoster

HPV

Pneumococcal

Hepatitis A

Hepatitis B

Meningococcal

Hib

- Live vaccine. Protects against Measles, Mumps and Rubella.

Measles



Mumps



Rubella



# Vaccines recommended for SOME



19-26 years



27-49 years



50-64 years

MMR

Varicella

Zoster

HPV

Pneumococcal

Hepatitis A

Hepatitis B

Meningococcal

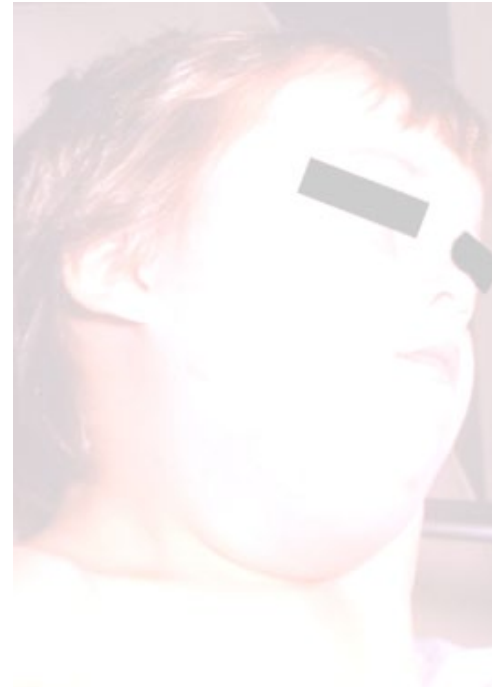
Hib

- Live vaccine. Protects against Measles, Mumps and Rubella.

Measles



Mumps



Rubella



# Vaccines recommended for SOME



19-26 years



27-49 years



50-64 years

MMR

Varicella

Zoster

HPV

Pneumococcal

Hepatitis A

Hepatitis B

Meningococcal

Hib

- Live vaccine. Protects against Measles, Mumps and Rubella.
- Do NOT give to immunocompromised adults or pregnant women!
- No evidence of immunity to measles, mumps, or rubella: 1 dose
- Evidence of immunity:
  - Born before 1957\*
  - Documented receipt of MMR
  - Laboratory evidence of immunity or disease.

\*For healthcare personnel, see 2023 adult immunization schedule for details.

# Vaccines recommended for SOME



19-26 years



27-49 years

MMR

Varicella

Zoster

HPV

Pneumococcal

Hepatitis A

Hepatitis B

Meningococcal

Hib

- Live vaccine. Protects against chickenpox
- Do NOT give to immunocompromised adults or pregnant women!
- No evidence of immunity to varicella: 2 doses
- Evidence of immunity:
  - Born in the U.S. before 1980\*
  - Documented receipt of 2 doses
  - Documentation of history of disease
  - Laboratory evidence of immunity or disease.



\*For excluded groups, please see 2023 adult immunization schedule for details.

# Vaccines recommended for SOME



19-26 years



27-49 years

MMR

Varicella

Zoster

HPV

Pneumococcal

Hepatitis A

Hepatitis B

Meningococcal

Hib

- Only give to immunocompromised adults aged 19 years or older
- Reminder: EVERYONE aged 50 years or older gets Zoster vaccine



# Vaccines recommended for SOME



27-49 years

MMR

Varicella

Zoster

HPV

Pneumococcal

Hepatitis A

Hepatitis B

Meningococcal

Hib

- Only SOME adults aged 27 through 45 years may need HPV vaccines.
- Talk to your health care provider to figure out if you need an HPV vaccine
- Reminder: EVERYONE up through 26 years of age needs HPV vaccine!

# Vaccines recommended for SOME



19-26 years



27-49 years



50-64 years

MMR

Varicella

Zoster

HPV

Pneumococcal

Hepatitis A

Hepatitis B

Meningococcal

Hib

Only SOME adults less than 65 years need pneumococcal vaccines:

- Alcoholism
- Chronic heart disease
- Chronic liver disease
- Chronic lung disease
- Cigarette smoking
- Diabetes mellitus
- Cochlear implant
- Cerebrospinal fluid leak
- Not having a spleen
- Sickle cell disease
- Chronic renal failure
- Congenital or acquired immunodeficiencies
- Cancer
- HIV infection
- Hodgkin disease
- Immunosuppression caused by treatment
- Leukemia
- Lymphoma
- Multiple myeloma
- Nephrotic syndrome
- Solid organ transplant

Reminder: ALL adults 65 years and older need pneumococcal vaccines!

# Vaccines recommended for SOME



19-26 years



27-49 years



50-64 years



65+ years

MMR

Varicella

Zoster

HPV

Pneumococcal

Hepatitis A

Hepatitis B

Meningococcal

Hib

Only SOME adults at risk for Hepatitis A infection should get vaccinated:

- Chronic liver disease
- HIV infection
- IV drug use
- Homelessness
- Lab work with hepatitis A virus
- Travel to countries with endemic hepatitis A
- Close, personal contact with international adoptee
- Pregnancy (if at risk for infection or severe outcome from infection)
- Other settings for exposure, including healthcare settings, group homes, day care facilities for developmentally disabled persons

Anyone who is NOT at risk but still wants protection from Hepatitis A can still be vaccinated.

# Vaccines recommended for SOME



- MMR
- Varicella
- Zoster
- HPV
- Pneumococcal
- Hepatitis A
- Hepatitis B**
- Meningococcal
- Hib

Risk-based recommendations for adults 60 years of age and older:

- Chronic liver disease
- HIV infection
- Sexual exposure risk
- Current or recent injection drug use
- Exposure to blood or body fluids
- Incarcerated persons
- Travel to countries with endemic hepatitis B

Anyone 60 years of age or older without known risk factors may still complete a HepB vaccine series.

# Vaccines recommended for SOME



19-26 years



27-49 years



50-64 years



65+ years

MMR

Varicella

Zoster

HPV

Pneumococcal

Hepatitis A

Hepatitis B

Meningococcal

Hib

Only SOME adults at risk for meningococcal infection should get vaccinated:

- Not having a spleen
- HIV infection
- Certain immunodeficiencies
- Travel to countries with endemic or epidemic meningococcal disease
- First-year college students living in residential housing
- Military recruits
- Lab work with *Neisseria meningitidis*

Meningococcal disease can often cause severe (and sometimes deadly) infections of the lining of the brain and spinal cord (meningitis) and bloodstream.

Shared by respiratory and throat secretions (saliva or spit)

# Vaccines recommended for SOME



19-26 years



27-49 years



50-64 years



65+ years

MMR

Varicella

Zoster

HPV

Pneumococcal

Hepatitis A

Hepatitis B

Meningococcal

Hib

Only SOME adults at risk for meningococcal infection should get vaccinated:

- Not having a spleen
- Having a hematopoietic stem cell transplant

Caused by a bacteria (*Haemophilus influenzae* type b) that can lead to pneumonia, bloodstream infections, and meningitis

Spread by respiratory droplets

## Immunization Schedules

Schedules Home

🏠 Schedules Home

For Health Care Providers +

For Parents & Adults +

### Related Links

[Vaccines & Immunizations](#)

[ACIP Vaccination  
Recommendations](#)

[ACIP: Acronyms for Vaccines](#)

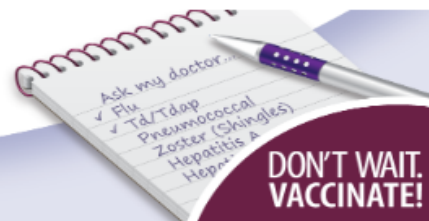
[Vaccine Guidelines and  
Recommendations for  
Emergency Situations](#)

[Delays in Vaccine Supply](#)

## The Adult Vaccine Assessment Tool

[Español \(Spanish\)](#) | [Print](#)

What **Vaccines**  
do **You** need?



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

Vaccines are recommended for adults based on age, health conditions, job, and other factors. No personal information will be retained by CDC.

\* *This vaccine assessment tool applies to adults 19 years or older.*

### COVID-19 Vaccination

- Everyone 6 months and older is now eligible to [get a free COVID-19 vaccination](#).
- COVID-19 vaccines are [safe and effective](#).
- To find COVID-19 vaccine locations near you, search [vaccines.gov](#), text your zip code to 438829, or call 1-800-232-0233.
- Healthcare providers can find ACIP recommendations for the use of COVID-19 vaccines on the [ACIP Vaccine Recommendations and Guidelines](#) page.

## Instructions:

1. Answer the questions below.
2. Get a list of vaccines you may need based on your answers.  
(This list may include vaccines you've already had).
3. Discuss the list with your doctor or health care professional.

## Questions:

1. Are you

Male

Female

2. What year were you born? (some vaccines are age-related)

2004 ▾

3. Have you ever had the chickenpox vaccine?

OR

Has a healthcare provider diagnosed you with chickenpox ever in your life, or do you have laboratory results showing that you had chickenpox sometime in your life?

Yes

No

Not Sure

4. Will you be traveling outside the U.S. in the near future?

Yes

No

5. Are you a first-year college student who lives in a college dormitory or a new military recruit?

Yes


No



# Immunization Schedules

Schedules Home



 Schedules Home

For Health Care Providers +

For Parents & Adults +

## Related Links

[Vaccines & Immunizations](#)

[Vaccines You Need as an Adult](#)

[Vaccine Information Statements](#)

[ACIP Vaccination Recommendations](#)

[Why Immunize?](#)

[Vaccines: The Basics](#)

## Your Vaccine Assessment Results

Your answers to the Adult Vaccine Assessment suggest that you may need the following vaccines if you have not had them before or are not already immune.

### Suggested Vaccines

- [MMR](#)
- [Hepatitis B](#)
- [Influenza](#)
- [Meningococcal](#)
- [Tdap, Td](#)
- [HPV](#)

The table below provides more information on each of the vaccines you may need. Click on the vaccine name for more details. The links at the bottom of the page will allow you to print these results and take them to your next medical appointments.

Vaccine	Suggested because...
<a href="#">MMR</a> - Measles-mumps-rubella	Your age indicates that you might need the MMR vaccine.
<a href="#">Hepatitis B</a>	Your age indicates that you might need hepatitis B vaccine.
<a href="#">Seasonal Flu (Influenza)</a>	People 6 months of age or older should get the flu vaccine.
<a href="#">Meningococcal</a>	Your age indicates that you might need meningococcal vaccine.
<a href="#">Tdap, Td</a> - Tetanus, Diphtheria, and Pertussis	You might need 1 dose of tetanus, diphtheria, and pertussis vaccine (Tdap). Tdap may be given regardless of when you last received a tetanus and diphtheria vaccine (Td). After you receive your Tdap, you will need a Td booster every 10 years.

[HPV](#) - Human Papillomavirus

Your age indicates that you might need HPV vaccine.

**Next Steps...**

Share this information with your doctor or other health care professional, along with your vaccination record. If you do not have a [vaccination record](#), now is a good time to start one.

Tell your doctor if you have already had any of these vaccines or diseases. To make sure you get the vaccines you need, your doctor will also need to know your allergies and history of disease.

[Print healthcare provider form](#)



[Print all vaccines information](#)



[Take Adult Vaccines Again](#) | [More vaccination information](#)

**More Information**

Call CDC-INFO, in English or Spanish: 1-800-CDC-INFO or 1-800-232-4636

**Related Pages**

[Adults Need Vaccines Too](#)

[Adult Immunization Schedule](#)

[Adolescent and Adult Vaccine Quiz web buttons](#)

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# Vaccine Administration

## General Rule of Thumb



- Don't miss an opportunity to vaccinate!
- Most non-live vaccines can be administered at any time before or after a different non-live vaccine or live vaccine.
- Live vaccines must be administered at the same visit or be separated by 28 days.
- Talk to a healthcare provider

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## Questions?

For more information, contact CDC  
1-800-CDC-INFO (232-4636)  
TTY: 1-888-232-6348 [www.cdc.gov](http://www.cdc.gov)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

