Immunizations in Long-Term Care – 2024-2025

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CVS Health Policy Statement

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Vaccination Coverage for Older Adults

Estimates are based upon the National Health Interview Surveys

- Use for all vaccines for adults remains below target
- Health care provider recommendations for a vaccination are associated with increased utilization

Potential Reasons for Underutilization

- Transfers/Frequent Admissions and Discharges
- Misinformation or Lack of Information About Vaccines
- Lack of Organized Infection Control Programs

VACCINE USE	AGE GROUP ASSESSED	% RECEIVING VACCINATION
Influenza	≥ 65 years	69.3%
Pneumococcal*	≥ 65 years	65.8%
RSV	≥ 60 years	17%
COVID-19	≥ 65 years	37.4%
Herpes Zoster	≥ 60 years	41.1%

RSV: respiratory syncytial virus

* Respondents were asked if they had “ever had a pneumonia shot ?”– not specific to any type or newer formulations

Black CL et al. Influenza, updated COVID-19, and respiratory syncytial virus vaccination coverage among adults – United States, Fall 2023. MMWR Morb Mortal Wkly Rep 2023;72:1377–1382.

Hung MC et al. Vaccination coverage among adults in the United States, national health interview survey, 2021. https://www.cdc.gov/vaccines/imz-managers/coverage/adultvaxview/pubs-resources/vaccination-coverage-adults-2021.html

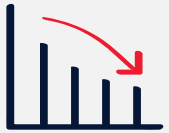
Vaccination Helps Prevent Disease

Influenza and pneumonia are a **leading cause of death** in the U.S.

Influenza vaccination in older adults is responsible for **80% of influenza-related deaths avoided**

Pneumococcal vaccines are **60 to 75% effective** against vaccine-type invasive disease in immunocompetent older adults

Updated COVID-19 vaccines reduced COVID-19 infections **by up to 54%**



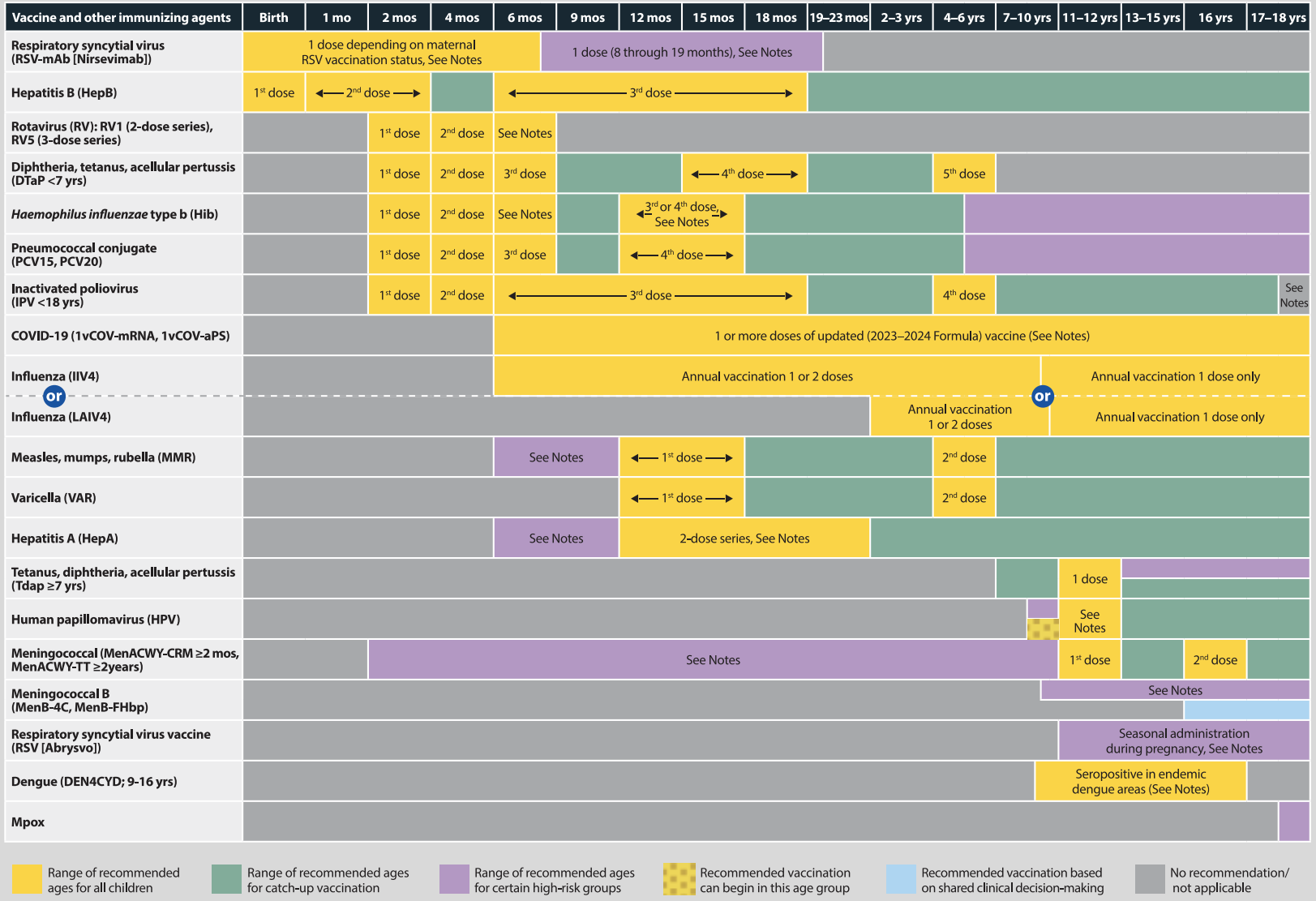
RSV vaccines reduced symptomatic lower respiratory tract infections by **80-90% in older adults**

Two doses of recombinant zoster vaccine are **more than 90%** effective in preventing herpes zoster

Hepatitis B vaccination effectiveness approaches **90 to 100%**

https://www.cdc.gov/pinkbook/hcp/table-of-contents/
http://www.cdc.gov/vaccines/
https://www.cdc.gov/nchs/fastats/leading-causes-of-death.htm
https://covid.cdc.gov/covid-data-tracker/#vaccine-effectiveness

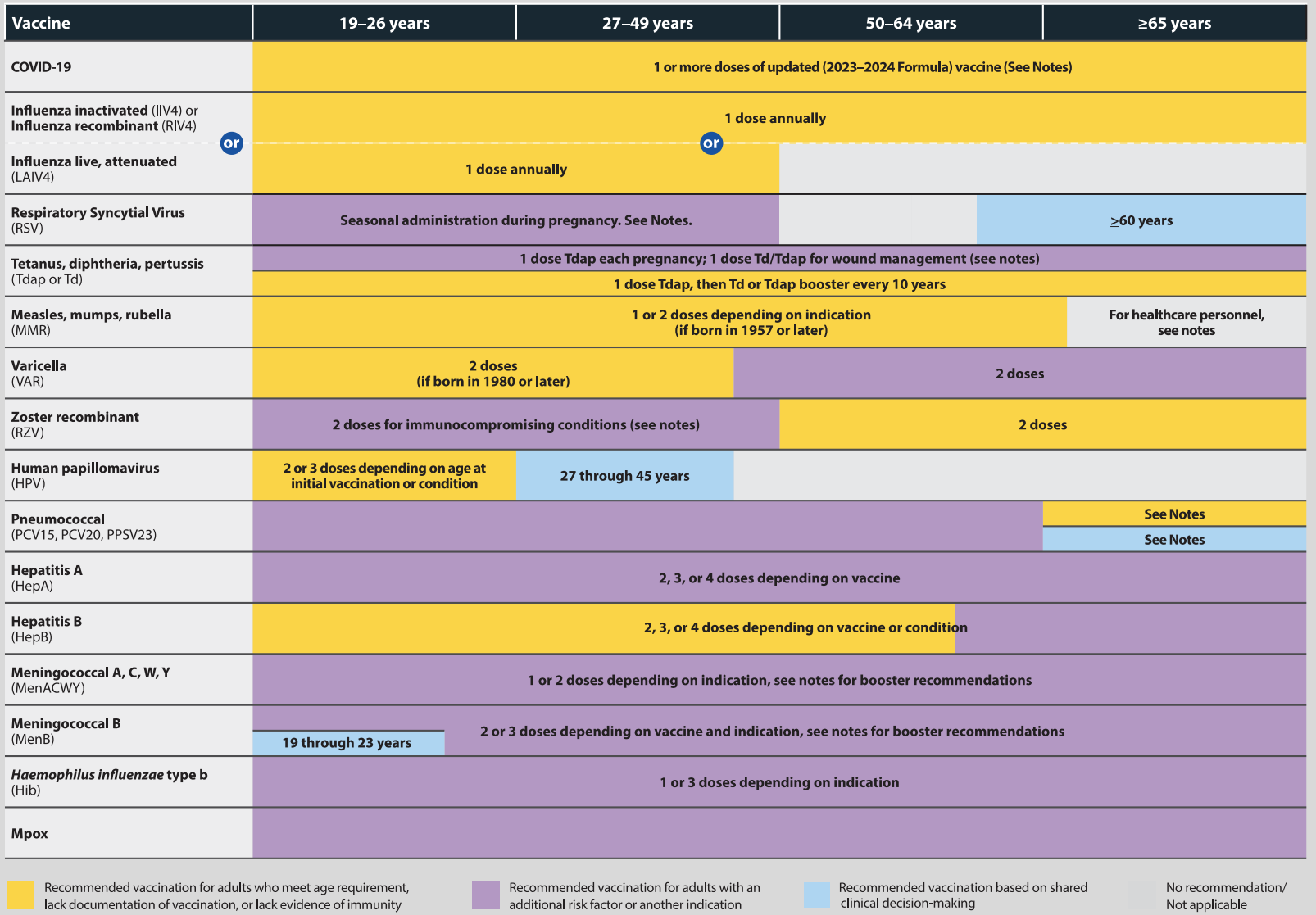
CDC Recommended Immunization Schedule for Children 0-18 Years (2024)



CDC: Centers for Disease Control and Prevention
Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2024.
https://www.cdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html

CDC Recommended Adult Immunization Schedule (2024)

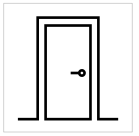
CDC: Centers for Disease Control and Prevention
Centers for Disease Control and Prevention. Recommended Adult Immunization Schedule for ages 19 years or older, United States, 2024. https://www.cdc.gov/vaccines/schedules/hcp/imz/adult.html



Immunizations We Can Talk About

Describe the proper use of specific vaccines common in long-term care including, but not limited to:

- Influenza
- Pneumococcal
- COVID-19
- Respiratory Syncytial Virus (RSV)
- Herpes Zoster (Shingles)
- Tetanus
- Hepatitis B
- Mumps, Measles, Rubella (MMR)
- Varicella

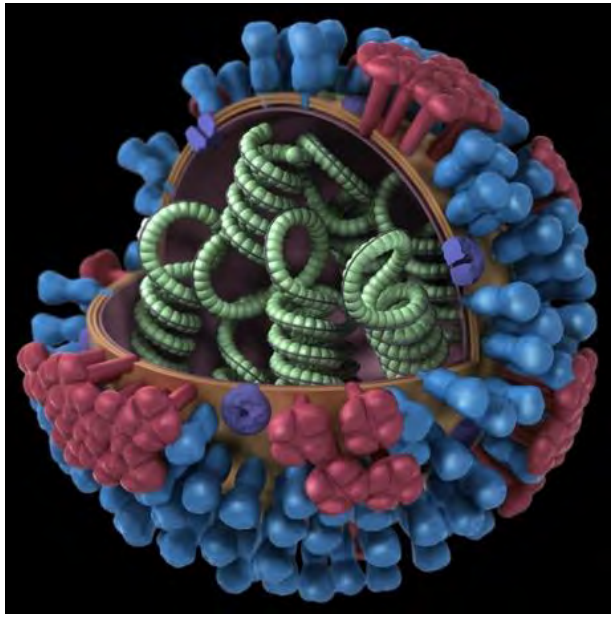


Exit

Influenza

Influenza

INFLUENZA TYPE	AFFECTED GROUPS	DISEASE SEVERITY	COMMENTS
A	All age groups, animals (e.g., birds) and humans	Moderate to severe disease	More severe illness, hospitalizations, and death are expected when Type A H3N2 viruses are most common (e.g., 2014-2015)
B	Generally, humans only; more commonly children	Mild disease	May be connected to Reye syndrome
C	Only affects humans but is rare	Mild symptoms if humans are affected	Not associated with epidemics



3D View of the influenza virus
Single-stranded, helically-shaped, RNA virus

https://www.cdc.gov/vaccines/pubs/pinkbook/flu.html
https://www.cdc.gov/flu/about/viruses/index.htm
https://www.cdc.gov/flu/resource-center/freeresources/graphics/images.htm

Influenza Disease

Peak Season

- Seasonal influenza can occur as early as October and can continue to occur as late as May
- Most commonly peaks in January or later

Transmitted Through

- Respiratory droplets when someone coughs or sneezes
  - Virus shed in respiratory secretions for 5 to 10 days

Incubation

Typically 2 days

Classic Symptoms

- Abrupt fever, muscle pain, sore throat, runny nose, headache, non-productive cough
  - Symptoms, other than weakness, rarely last more than 3 to 7 days

https://www.cdc.gov/pinkbook/hcp/table-of-contents/

Influenza Disease – Complications

Pneumonia
(viral or bacterial)

Bronchitis

Reye syndrome

Ear infections

Dehydration

Inflammation of the heart or brain

Muscle pain and/or damage

Multi-organ failure
(e.g., kidney, respiratory)

Sepsis

Worsening of other chronic conditions (e.g., heart failure, asthma, diabetes)

https://www.cdc.gov/flu/professionals/acip/clinical.htm
https://www.cdc.gov/pinkbook/hcp/table-of-contents/

Egg-Based Influenza Vaccines for 2024-2025

TRADE NAME	MANUFACTURER	CONTAINS MERCURY?	APPROVED AGE GROUP
Trivalent, Standard Dose, Inactivated Influenza Vaccine (SD-IIV3)			
Afluria	Seqirus	In MDV Only	≥ 6 months*
Fluarix	GlaxoSmithKline	No	≥ 6 months
FluLaval	GlaxoSmithKline	No	≥ 6 months
Fluzone	Sanofi Pasteur	In MDV Only	≥ 6 months
Trivalent, High Dose, Inactivated Influenza Vaccine (HD-IIV3)			
Fluzone High-Dose	Sanofi Pasteur	No	≥ 65 years†
Trivalent, Inactivated Influenza Vaccine with Adjuvant (aIIV3)			
Fluad	Seqirus	No	≥ 65 years†
Intranasal, Trivalent, Live Attenuated Influenza Vaccine (LAIV3)			
FluMist	AstraZeneca	No	2 through 49 years

COMPOSITION OF THE 2024–2025 EGG-BASED VACCINES (A + A + B):
A/Victoria/4897/2022 (H1N1)pdm09-like virus +
A/Thailand/8/2022 (H3N2)-like virus +
B/Austria/1359417/2021 (Victoria lineage)-like virus

MDV: Multiple-dose vials
* Afluria may also be given using a jet injector for those 18 to 64 years of age..
† While not FDA-approved, HD-IIV3 and aIIV3 are now also recommended as acceptable options for adult recipients of solid organ transplants
https://www.cdc.gov/flu/season/faq-flu-season-2024-2025.htm
https://www.cdc.gov/vaccines/schedules/hcp/imz/adult-schedule-addendum.html

Non-Egg Based Influenza Vaccines for 2024-2025

TRADE NAME	MANUFACTURER	CONTAINS MERCURY?	APPROVED AGE GROUP	COMPOSITION OF THE 2024–2025 CELL- OR RECOMBINANT-BASED VACCINES (A + A + B):
Trivalent, Cell Culture-based Inactivated Influenza Vaccine (ccIIV3)				
Flucelvax	Seqirus	In MDV Only	≥ 6 months	A/Wisconsin/67/2022 (H1N1)pdm09-like virus + A/Massachusetts/18/2022 (H3N2)-like virus + B/Austria/1359417/2021 (Victoria lineage)-like virus
Trivalent, Recombinant Influenza Vaccine (RIV3)				
Flublok	Sanofi Pasteur	No	≥ 18 years	

MDV: Multiple-dose vials
https://www.cdc.gov/flu/season/faq-flu-season-2024-2025.htm

Less Common Administration Options for Influenza Vaccines

Live Attenuated Influenza Virus (LAIV) [FluMist]

- One dose is 0.2 mL divided equally between nostrils
  - Grown in egg protein
- Approved for use in healthy, non-pregnant persons aged 2 to 49 years old
  - Do not use if receiving aspirin- or salicylate containing products
  - Avoid or use with caution in those with asthma
  - Should not be used by close contacts or caregivers of severely immunocompromised persons who require a protected environment

PharmaJet Stratis Needle-Free Injector

- A reusable, spring-powered device that uses a single-use, sterile, needle-free syringe (what comes into contact with the skin)
  - Uses a high-pressure, narrow stream of fluid to penetrate the skin instead of a hypodermic needle
- Currently only approved for use with Afluria in adults 18 to 64 years of age
- Associated with a higher rate of tenderness, swelling, pain, and redness at the injection site

Grohskopf LA et al. Prevention and control of seasonal influenza with vaccines: Recommendations of the Advisory Committee on Immunization Practices – United States, 2024-25 influenza season. MMWR Recomm Rep 2024; 73(5):1-25.
Please refer to individual prescribing information at https://dailymed.nlm.nih.gov/dailymed/

Injectable Influenza Vaccine – Dosage and Administration

Dosage

- Infants and children 6 to 35 months: one or two doses of 0.25 mL or 0.5 mL depending upon which vaccine is used
- Children 3 to 8 years: one or two 0.5 mL doses
- Children 9 years and older or adults: one 0.5 mL dose for any age-appropriate vaccine

Administration

- Intramuscular administration only
  - Unless using Afluria via jet injector
- Infants and children 6-35 months: administer into the anterolateral aspect of the thigh
- Anyone over 3 years of age: administer into the deltoid muscle

Grohskopf LA et al. Prevention and control of seasonal influenza with vaccines: Recommendations of the Advisory Committee on Immunization Practices – United States, 2024-25 influenza season. MMWR Recomm Rep 2024; 73(5):1-25.

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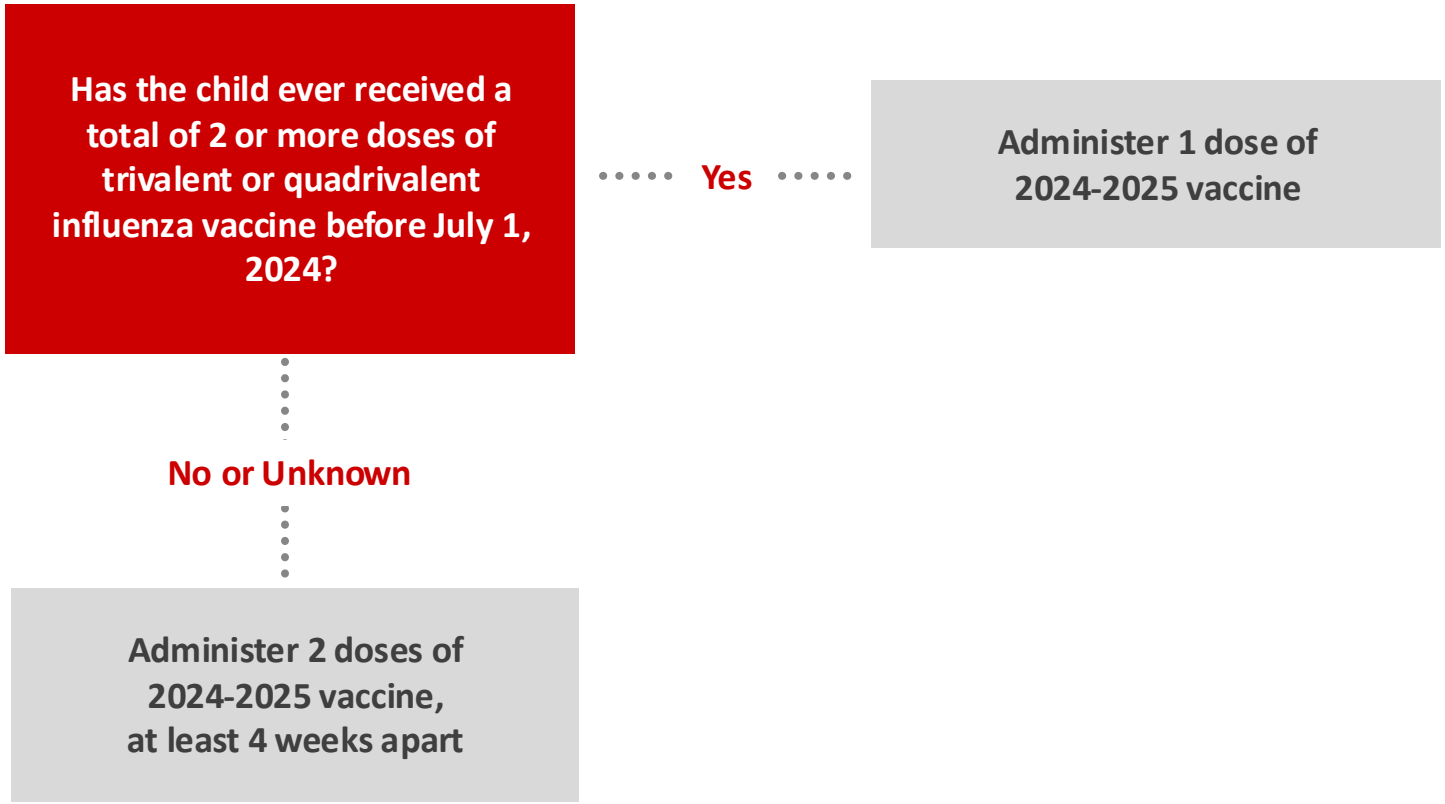
How Many Doses of Influenza Vaccine Does a Child (6 months through 8 years) Need?



Grohskopf LA et al. Prevention and control of seasonal influenza with vaccines: Recommendations of the Advisory Committee on Immunization Practices – United States, 2024-25 influenza season. MMWR Recomm Rep 2024; 73(5):1-25.

Influenza Vaccine – Storage Recommendations

- Should be stored in the refrigerator at 36ºF to 46ºF (2ºC to 8ºC)
  - Check and record temperature at least twice daily for refrigerators that store vaccines
  - Do not use if ever frozen - freezing destroys potency
  - Always store vaccines in the body of the refrigerator
    - Not in the vegetable bins, on the floor, next to the walls, in the door, or under cooling vents

- Multi-dose Afluria should be dated upon opening and discarded after 28 days

- Multi-dose vials of Fluzone or Flucelvax may be used until the expiration date printed on the package if stored properly and not visibly contaminated

- Always inspect vials for particulate matter prior to each use

CDC. Vaccine storage & handling toolkit. Mar 2024.
Please refer to individual prescribing information at https://dailymed.nlm.nih.gov/dailymed/
This slide contains references to brand-name prescription drugs that are trademarks or registered trademarks of pharmaceutical manufacturers not affiliated with CVS Health

Influenza Vaccine Adverse Effects

Local Reactions (common)

Soreness, redness, swelling at injection site

- Generally last only 1 to 2 days after injection
- More frequent with:
  - high-dose vaccine (i.e., Fluzone High-Dose)
  - adjuvanted vaccine (e.g., Fluad)
  - the jet-injector spray (i.e., Afluria)

Non-specific Systemic Symptoms

Fever, chills, malaise, and muscle pain

- Generally occur within 12 hours after vaccination and last only 1 to 2 days

Severe Reactions (rare)

Immediate hypersensitivity (e.g., anaphylaxis, angioedema), Guillain-Barré Syndrome

- Allergic reaction may be due to other ingredients (e.g., gelatin, latex)
- Based on specific product that caused a reaction, vaccination may still be possible with an alternative product and special precautions

https://www.cdc.gov/pinkbook/hcp/table-of-contents/
https://www.cdc.gov/flu/

Overview of Influenza Vaccine Recommendations

Who?

All persons aged greater than or equal to 6 months, unless otherwise contraindicated

When?

- Vaccinate all residents in your facility
  - "by the end of October" if possible, but even in December or later can be beneficial during most seasons
  - Avoid early vaccination (i.e., July or August) unless vaccination later may not be possible
- Unvaccinated admissions (through March 31) should be vaccinated promptly

How?

- Most are given IM
- Can co-administer with a COVID-19, RSV, or a pneumococcal vaccine
  - Use different site of administration

Who Else?

Vaccinating health care personnel, caregivers, and other staff will also protect patients from outbreaks

Grohskopf LA et al. Prevention and control of seasonal influenza with vaccines: Recommendations of the Advisory Committee on Immunization Practices – United States, 2024-25 influenza season. MMWR Recomm Rep 2024; 73(5):1-25.
Centers for Medicare and Medicaid Services. State operations manual. Appendix PP: Guidance to surveyors for long term care facilities, F883/483.80 Influenza and pneumococcal immunizations. 2023.

Influenza Vaccine Effectiveness

Older adults often have lower antibody response to vaccines

- May remain susceptible to upper respiratory infections
- Data support protection for at least 4 months but conflicting data exist as to how quickly vaccine effectiveness declines

The 2022-2023 influenza vaccine is estimated to have prevented:

64,000
influenza-related hospitalizations

~3,600
Influenza-related deaths

https://www.cdc.gov/flu/vaccines-work/past-burden-prevented-est.html

Grohskopf LA et al. Prevention and control of seasonal influenza with vaccines: Recommendations of the Advisory Committee on Immunization Practices – United States, 2024-25 influenza season. MMWR Recomm Rep 2024; 73(5):1-25.

Strategies That Are NOT Recommended

Delaying vaccination

May result in greater immunity later in the season, but deferral may result in missed opportunities to vaccinate

Giving a “booster” dose by revaccinating later in the season

Revaccination is not proven to be any more effective than a single vaccine regardless of when the current season vaccine was received

Which Vaccine Should You Choose for Older Adults?

Since 2022 ACIP has recommended that older adults "preferentially receive" either:

- a higher dose influenza vaccine or
- an adjuvanted influenza vaccine

HIGHER DOSE	ADJUVANTED
Fluzone High-Dose	Fluad
Flublok	

ACIP states:

- Vaccination should not be delayed if a specific product is not available.
- If none of these 3 vaccines is available at an opportunity for vaccination, then any other age-appropriate influenza vaccine should be administered

Grohskopf LA et al. Prevention and control of seasonal influenza with vaccines: Recommendations of the Advisory Committee on Immunization Practices – United States, 2024-25 influenza season. MMWR Recomm Rep 2024; 73(5):1-25.

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Preferred Vaccines for Older Adults

Fluzone High-Dose (HD-IIV3)

- Each 0.5 mL dose contains 4x the amount of each antigen (60 mcg)
- Most extensively studied of these options

Flublok (RIV3)

- Contains 3x the amount of each antigen (45 mcg)

Fluad (aIIV3)

- Contains an adjuvant (MF59) that helps stimulate or enhance the body's response to the vaccine

There is limited data comparing these 3 vaccines:

- **Data do NOT support one being superior over another**
- **Data show few differences in safety**

aIIV3: trivalent inactivated influenza vaccine with adjuvant; FDA: U.S. Food and Drug Administration; HD-IIV3: trivalent, high-dose, inactivated influenza vaccine; ILI: influenza-like illness; RIV3: trivalent recombinant influenza vaccine; SD-IIV3 : trivalent, standard dose, inactivated influenza vaccine

Grohskopf LA et al. Prevention and control of seasonal influenza with vaccines: Recommendations of the Advisory Committee on Immunization Practices – United States, 2024-25 influenza season. MMWR Recomm Rep 2024; 73(5):1-25.
https://www.cdc.gov/flu/prevent/different-flu-vaccines.htm

What about Patients with Allergies?

Ingredients of various influenza vaccines may differ (e.g., aminoglycosides, egg protein)

Refer to specific product labeling if potential allergies are noted as other formulations may be more appropriate

Severe allergic reactions to egg-based influenza vaccines is now considered "rare"

"Egg allergy alone necessitates **no additional safety measures** for influenza vaccination beyond those recommended for any recipient of any vaccine, regardless of severity or previous reaction egg"

"Any influenza vaccine (egg based or nonegg based) that is otherwise appropriate for the recipient's age and health status can be used"

All individuals (regardless of allergy history) should be monitored for at least 15 minutes after vaccination

Grohskopf LA et al. Prevention and control of seasonal influenza with vaccines: Recommendations of the Advisory Committee on Immunization Practices – United States, 2024-25 influenza season. MMWR Recomm Rep 2024; 73(5):1-25.

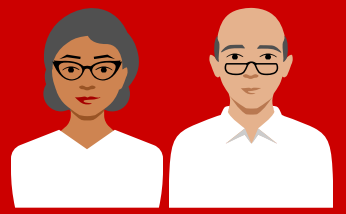
Influenza Disease – Treatment

Antiviral Drugs (i.e., Tamiflu, Relenza, Rapivab, and Xofluza)

Treatment should be initiated within 48 hours of the onset of symptoms

Relenza (zanamivir)	inhaled powder; not recommended for individuals with underlying respiratory conditions (e.g., asthma, COPD)
Tamiflu (oseltamivir)	must adjust dose based upon kidney function
Xofluza (baloxavir)	one-time oral dose based upon weight
Rapivab (peramivir)	single dose given intravenously; must adjust dose based upon kidney function

Note: amantadine and rimantadine are NOT recommended due to resistance



All long-term care facility residents who have confirmed or suspected influenza should receive antiviral treatment immediately

https://www.cdc.gov/pinkbook/hcp/table-of-contents/
https://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm
Please refer to individual prescribing information at https://dailymed.nlm.nih.gov/dailymed/
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Influenza Disease – Prophylaxis Beyond Annual Vaccination

Implement standard (e.g., gloves, gowns) and droplet precautions (e.g., face masks, private rooms) for anyone with suspected or confirmed influenza

- For 7 days after illness onset or 24 hours after the resolution of fever and respiratory symptoms (whichever is longer)

Initiate outbreak control measures and antiviral prophylaxis for ALL non-ill residents on the same unit when at least 2 residents on the same unit are ill within 72 hours, and at least one has laboratory-confirmed influenza

In the long-term care setting, duration of post-exposure prophylaxis is at least 2 weeks, and continuing for at least 7 days after the last known case of influenza was identified

Conduct daily active surveillance throughout the facility until at least 1 week after the last confirmed case was identified

https://www.cdc.gov/flu/professionals/infectioncontrol/ltc-facility-guidance.htm

Influenza Vaccination Rates Among Long-Term Care vs. Other Health Care Personnel

Consider vaccination rates as one measure of a patient safety quality program

Encourage strong vaccination policies:

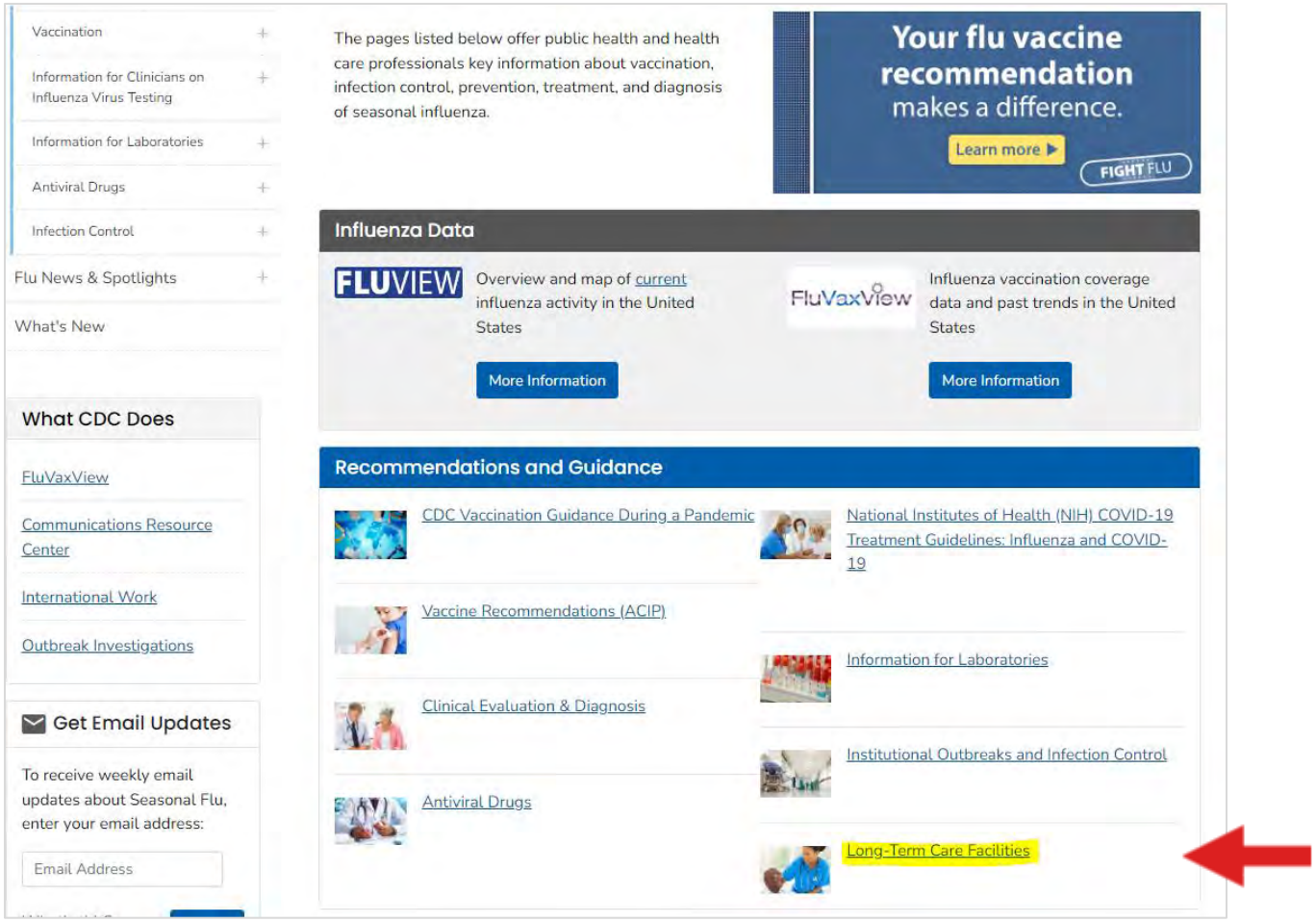
- signed statements by those who refuse vaccination
- on-site, no cost vaccination
- offer vaccination throughout the season

In the 2022-2023 season, only 75.9% of health care professionals were vaccinated for influenza.

The lowest coverage rate occurred in long-term care and home-health care (68.3%).

https://www.cdc.gov/flu/fluvaxview/hcp-coverage_22-23-estimates.htm

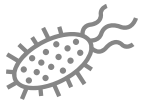
CDC Influenza Resources Specific for Long-Term Care



CDC: Centers for Disease Control and Prevention
https://www.cdc.gov/flu/professionals/

Pneumococcal

Pneumococcal Disease



Streptococcus pneumoniae – Gram-positive anaerobe

Spread by person-to-person contact via respiratory droplets

Clinical spectrum of infections ranges from:

- invasive disease (e.g., osteomyelitis, bacteremia, pneumonia with bacteremia) to
- non-invasive infections (e.g., pneumonia, ear infection, sinusitis)

100

Different serotypes have been discovered

15

serotypes in PCV15

20

serotypes in PCV20

21

serotypes in PCV21

23

serotypes in PPSV23

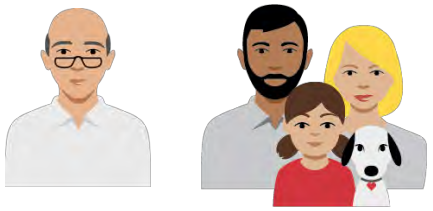
https://www.cdc.gov/pneumococcal/hcp/clinical-overview/index.html
https://www.cdc.gov/pinkbook/hcp/table-of-contents/
https://www.fda.gov/vaccines-blood-biologics/capvaxive

Pneumococcal Disease – Complications

In addition to ear and sinus infections, pneumococcal disease can cause:

Meningitis	Bacteremia	Pneumonia
2,000 cases annually	**4,000** cases annually	**150K** hospitalizations annually
8% children mortality rate	**20%** mortality rate (up to 60% in older adults)	**5-7%** mortality rate (rate may be higher in older adults)
22% adult mortality rate		Cause of up to **30%** of adult community-acquired pneumonia (CAP) cases

Mortality is highest among older adults and those with underlying high-risk medical conditions



https://www.cdc.gov/pneumococcal/hcp/clinical-signs/
https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-17-pneumococcal-disease.html

Pneumococcal Vaccines for use in Pediatrics

	PNEUMOCOCCAL 15-CONJUGATE (PCV15) – VAXNEUVANCE	PNEUMOCOCCAL 20-CONJUGATE (PCV20) – PREVNAR 20	PNEUMOCOCCAL POLYSACCHARIDE (PPSV23) – PNEUMOVAX 23
About the Preparation	• Shake vigorously prior to use • Contains aluminum as adjuvant	• Shake vigorously prior to use • Contains aluminum as adjuvant	• Do not need to shake • Contains phenol as a preservative
Storage	• Store in refrigerator (do not freeze)	• Store syringes horizontally in refrigerator (do not freeze)	• Store in refrigerator (do not freeze)
Dosage	• 0.5 mL intramuscularly • 4 injections at 2, 4, 6, and 12 to 15 months of age	• 0.5 mL intramuscularly • 4 injections at 2, 4, 6, and 12 to 15 months of age	• 0.5 mL subcutaneous or intramuscularly (deltoid muscle or lateral mid-thigh) • Only used in special situations - refer to prescriber for specific guidance

https://www.cdc.gov/vaccines/vpd/pneumo/public/
Please refer to individual prescribing information at https://dailymed.nlm.nih.gov/dailymed/
This slide contains references to brand-name prescription drugs that are trademarks or registered trademarks of pharmaceutical manufacturers not affiliated with CVS Health.

Pneumococcal Vaccines for use in Adults

	PNEUMOCOCCAL 15-CONJUGATE (PCV15) - VAXNEUVANCE	PNEUMOCOCCAL 20-CONJUGATE (PCV20) – PREVNAR 20	PNEUMOCOCCAL 21-CONJUGATE (PCV21) – CAPVAXIVE	PNEUMOCOCCAL POLYSACCHARIDE (PPSV23) – PNEUMOVAX 23
About the Preparation	• Contains aluminum as adjuvant; shake vigorously prior to use	• Contains aluminum as adjuvant; shake vigorously prior to use	• Does not contain any preservatives	• Contains phenol as a preservative
Storage	• Store in refrigerator (do not freeze)	• Store syringes horizontally in refrigerator (do not freeze)	• Store in refrigerator (do not freeze)	• Store in refrigerator (do not freeze)
Dosage	• 0.5 mL intramuscularly	• 0.5 mL intramuscularly	• 0.5 mL intramuscularly	• 0.5 mL subcutaneous or intramuscularly (deltoid muscle or lateral mid-thigh)

Please refer to individual prescribing information at https://dailymed.nlm.nih.gov/dailymed/
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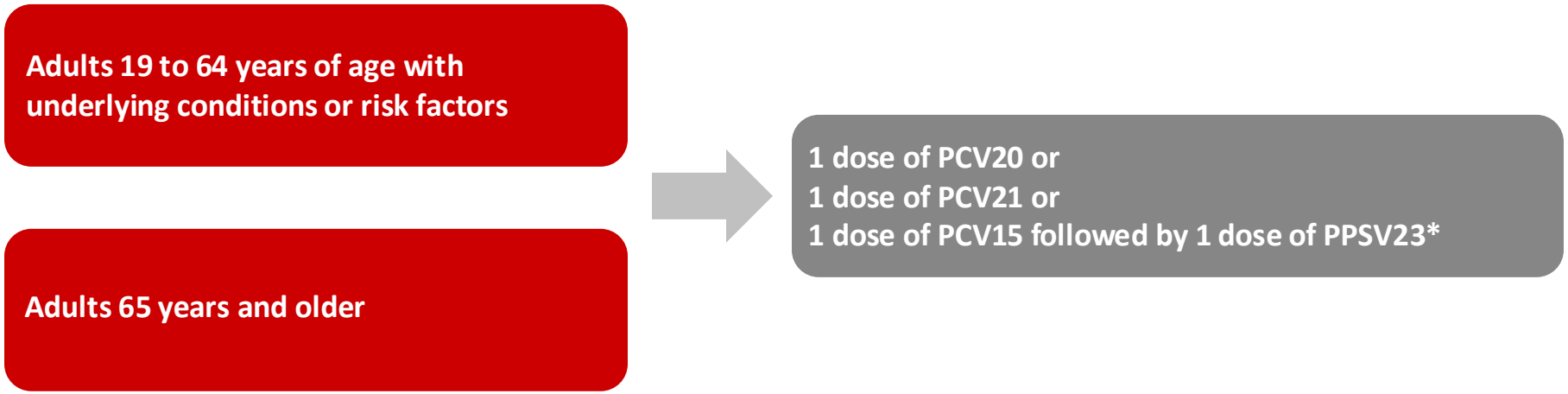
General Pneumococcal Vaccine Recommendations for Unvaccinated Adults



*Timing of the PPSV23 dose is most often after 1 year or later, but for individuals with immunocompromising conditions, cochlear implants or cerebrospinal fluid leak, a shorter interval may be advisable (but at least 8 or more weeks)

Centers for Disease Control and Prevention. Recommended Adult Immunization Schedule for ages 19 years or older, United States, 2024. https://www.cdc.gov/vaccines/schedules/hcp/imz/adult.html

Pneumococcal Vaccine Recommendations for Adults

The CDC definition of "underlying medical conditions or other risk factors" for which PCV are recommended includes:

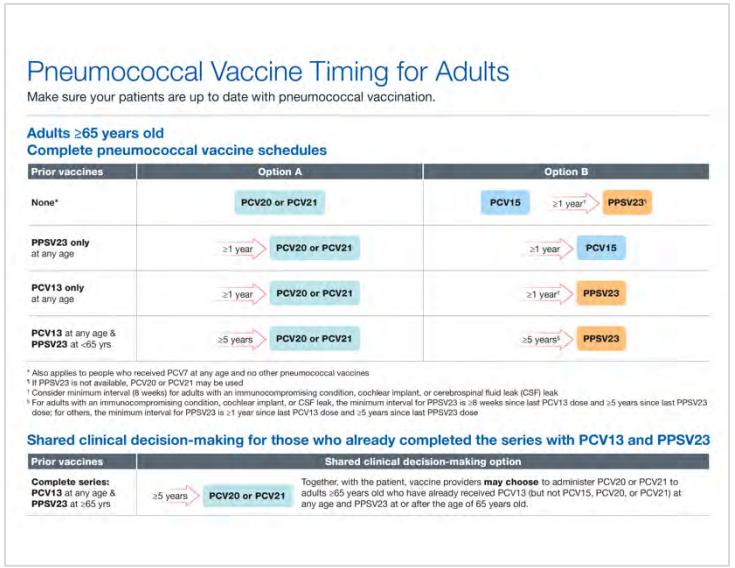
Alcoholism	Congenital or acquired asplenia	Kidney Failure
Chronic heart, liver or lung disease	Diabetes	Malignancies including Hodgkin's disease, leukemia, lymphoma, and multiple myeloma
Cerebrospinal fluid (CSF) leaks	Human immunodeficiency virus (HIV)	Nephrotic syndrome
Cigarette smoking	Immunodeficiency	Sickle cell or other hemoglobin-related disorders
Cochlear Implant	Iatrogenic immunosuppression (defined as receiving the equivalent of 20 mg or more of prednisone for at least 2 weeks)	Solid organ transplants

Centers for Disease Control and Prevention. Recommended Adult Immunization Schedule for ages 19 years or older, United States, 2024. https://www.cdc.gov/vaccines/schedules/hcp/imz/adult.html

Which Pneumococcal Vaccine(s) Should an Individual Get?

Determination may include consideration of:

- Age
- Past pneumococcal vaccination history
- Chronic health conditions (e.g., cigarette smoking, diabetes)
- High risk conditions (i.e., CSF leak, cochlear implant)
- Immunocompromising conditions (e.g., kidney failure, cancer)
- Shared decision making



Pneumococcal Vaccine Timing for Adults

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

Adults ≥65 years old
Complete pneumococcal vaccine schedules

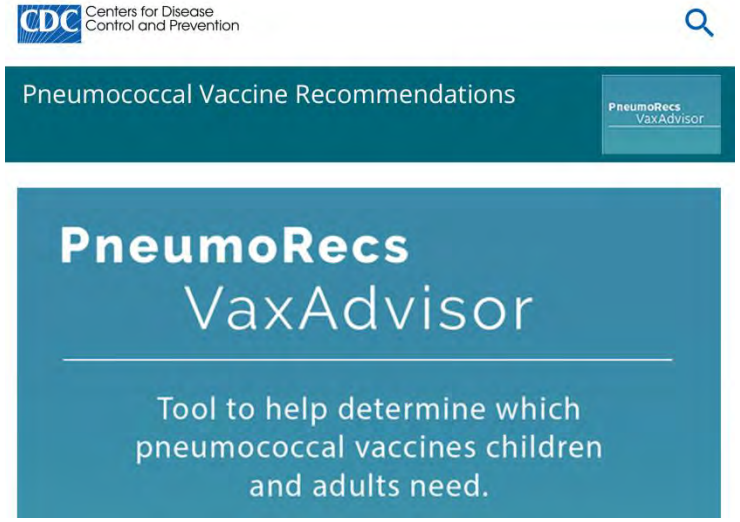
Prior vaccines	Option A	Option B
None*	PCV20 or PCV21	PCV15 → ≥1 year† → PPSV23§
PPSV23 only at any age	≥1 year → PCV20 or PCV21	≥1 year → PCV15
PCV13 only at any age	≥1 year → PCV20 or PCV21	≥1 year† → PPSV23
PCV13 at any age & PPSV23 at <65 yrs	≥5 years → PCV20 or PCV21	≥5 years‡ → PPSV23

* 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
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.

Available at:
https://www.cdc.gov/pneumococcal/downloads/Vaccine-Timing-Adults-JobAid.pdf



Available as a free App or online at:
https://www.cdc.gov/pneumococcal/hcp/vaccine-recommendations/app.html?CDC_AAref_Val=https://www.cdc.gov/vaccines/vpd/pneumo/hcp/pneumoapp.html

CSF: cerebrospinal fluid

Centers for Disease Control and Prevention. Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2024. https://www.cdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html
Centers for Disease Control and Prevention. PneumoRecs VaxAdvisor. https://www.cdc.gov/vaccines/vpd/pneumo/hcp/pneumoapp.html
Centers for Disease Control and Prevention. Pneumococcal vaccine timing for adults. 2023. https://www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf

Pneumococcal Vaccine Adverse Effects and Precautions

Adverse Effects

- Local reactions
  - Pain, swelling, redness, or tenderness at injection site for less than 48 hours
  - More common with revaccinations
- Fever or muscle aches
- Headache or fatigue
- Serious allergic reaction or injury is rare

Precautions

- Delay administration for those with moderate to severe illnesses until recovered
- Avoid use of pneumococcal conjugate vaccines in individuals with allergies to any *diphtheria* toxoid-containing vaccine
  - Risk is due to a non-toxic *diphtheria* protein used in the manufacturing process

https://www.cdc.gov/vaccines/hcp/vis/current-vis.html

Pneumococcal Disease Treatment

Penicillins were previously the drug of choice

Now pneumococcal bacteria are resistant to one or more antibiotics in 30% of cases

Resistance to penicillin has further increased the need to vaccinate as the primary defense

Treatment may include a 3rd-generation cephalosporin, vancomycin, or a respiratory fluoroquinolone (e.g., levofloxacin, moxifloxacin)

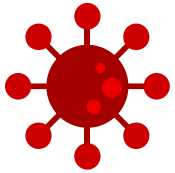
Consider severity and available culture and sensitivity data when determining agent of choice, schedule, dosage and duration of therapy

Sanford guide. Pneumonia, Streptococcus pneumoniae. 2023.
https://www.cdc.gov/antimicrobial-resistance/media/pdfs/strep-pneumoniae-508.pdf
https://www.cdc.gov/pneumococcal/

COVID-19

COVID-19

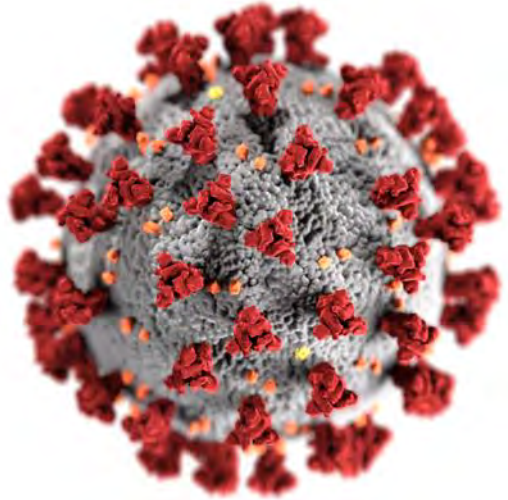
Always check for the latest information on COVID-19 vaccines at
https://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/covid-19-vaccines



Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the virus that causes coronavirus disease (COVID-19)

Vaccines target the spike (S) protein preventing virus from multiplying

Spreads via airborne transmission and by respiratory droplets, putting physical distance between yourself and others can help lower the risk of transmission.



https://www.cdc.gov/covid/about/
https://www.cdc.gov/respiratory-viruses/prevention/physical-distancing.html
https://phil.cdc.gov/Details.aspx?pid=23313
This slide contains references to brand-name prescription drugs that are trademarks or registered trademarks of pharmaceutical manufacturers not affiliated with CVS Health.

COVID-19 and Influenza Symptoms

Symptoms Common to Both

- Fever or feeling feverish/chills
- Cough
- Shortness of breath or difficulty breathing
- Tiredness
- Sore throat
- Runny or stuffy nose
- Muscle pain or body aches
- Headache
- Vomiting and diarrhea
- Change in/loss of taste or smell (more common with COVID-19)

Both COVID-19 and Influenza can have varying degrees of signs and symptoms, ranging from no symptoms (asymptomatic) to severe symptoms

Recovery from influenza usually is a few days to less than two weeks while recovery from COVID-19 may take weeks to months

https://www.cdc.gov/flu/symptoms/flu-vs-covid19.htm

Complications of Influenza and COVID-19

Specific to COVID-19

Complication risks include:

- Blood clots
- Multisystem inflammatory syndrome
- Long/Post-COVID conditions*
  - difficulty thinking
  - neurological symptoms (e.g., taste disturbance)

Common to Influenza and COVID-19

- Pneumonia
- Respiratory failure
- Acute respiratory distress syndrome
- Sepsis
- Heart attacks and stroke
- Worsening of chronic medical conditions
- Organ failure
- Secondary bacterial infections

* Not all-inclusive; for more information, please refer to https://www.cdc.gov/covid/long-term-effects/
https://www.cdc.gov/flu/symptoms/flu-vs-covid19.htm

Protecting Yourself and Others from COVID-19

Staying up to date with COVID-19 vaccines	Proper use of masks	Increasing space and distance
Avoiding crowds and poorly ventilated spaces	Good hand hygiene	Cleaning and disinfecting

https://www.cdc.gov/covid/prevention/index.html

COVID-19 Vaccines: Storage and Administration

Info is based on CDC Interim Clinical Considerations for Use of COVID-19 Vaccines in the U.S as of Aug 30, 2024

	Comirnaty Pfizer-BioNTech	Spikevax Moderna	Novavax Adjuvanted
About the Preparation	• Contains polyethylene glycol • Once thawed, refrigerate vial or prefilled syringe and use within 10 weeks • Once at room temperature, discard after 12 hours	• Contains polyethylene glycol • May store in refrigerator between 36°F and 46°F (2°C and 8°C) for up to 30 days or at room temperature up to 77° F (25° C) for a total of 24 hours • Following withdrawal of the first dose from multidose vial, discard any unused vaccine after 12 hours (room or refrigerator)	• Contains polysorbate • Store in refrigerator between 36°F and 46°F (2°C and 8°C) until expiration date • Following withdrawal of the first dose, vial must remain between 36°F and 77°F (2°C and 25°C), discard any unused vaccine after 12 hours
Dosage for those who have received a dose of any previous vaccine*	• ≥ 12 years: 0.3 mL IM (deltoid) at least 8 weeks after last previous dose of vaccine	• ≥ 12 years: 0.5 mL IM (deltoid) at least 8 weeks after last previous dose of vaccine	• ≥ 12 years: 0.5 mL IM (deltoid) at least 8 weeks after last previous dose of vaccine

COVID-19 vaccines:

1. do not contain preservatives, thimerosal, or antibiotics
2. should not be shaken, refrozen, or exposed to direct sunlight or ultraviolet light
3. Refer to cdc.gov/coronavirus/2019-nCoV/ for current guidance

* Additional guidance may be available from the CDC for individuals that have no previous vaccination, those who are moderately or severely immunocompromised, or younger than listed ages
IM = intramuscularly
https://www.cdc.gov/vaccines/covid-19/clinical-considerations/covid-19-vaccines-us.html
https://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/covid-19-vaccines
Please refer to individual prescribing information at https://dailymed.nlm.nih.gov/dailymed/
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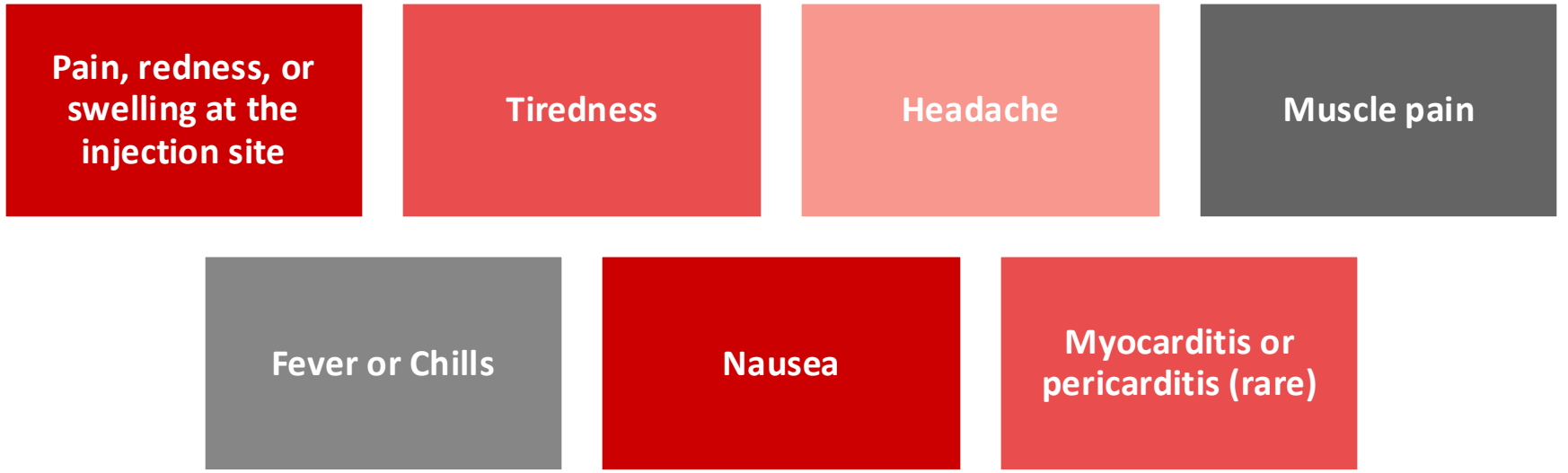
COVID-19 Vaccines: Adverse Effects



https://www.cdc.gov/vaccines/covid-19/clinical-considerations/covid-19-vaccines-us.html
Please refer to individual prescribing information at https://dailymed.nlm.nih.gov/dailymed/

Determining Who Should Receive COVID-19 Vaccination

Contraindication	Precaution	Vaccinate
• History of a severe allergic reaction after previous dose or known allergy to a component of the vaccine	• History of non-severe allergy to component of COVID-19 vaccine OR non-severe immediate allergic reaction after previous dose of one COVID-19 vaccine type • History of MIS-C or MIS-A • Defer vaccination for the following scenarios: - Known current COVID-19 infection or acute moderate-to-severe illness – until recovered - Myocarditis or pericarditis after any COVID-19 vaccine – consider only if benefits outweigh risks and defer second dose until episode has resolved	• Everyone ages 6 months and older unless they have a contraindication or precaution
Actions		
• Do not vaccinate with same type of vaccine • Consider referral to allergist-immunologist • Consider other vaccine alternative if age appropriate	• Risk assessment; Consider referral to allergist-immunologist • 30-minute observation period if vaccinated	• 30-minute observation period for those with history of anaphylaxis (due to any cause) • 15-minute observation period for all other people
Antibody testing is not recommended for purposes of vaccine decision-making		

MIS-A = multisystem inflammatory syndrome in adults; MIS-C = multisystem inflammatory syndrome in children
https://www.cdc.gov/vaccines/covid-19/clinical-considerations/covid-19-vaccines-us.html

Treatments for COVID-19

SARS-CoV-2 Antiviral

Ritonavir-boosted nirmatrelvir (Paxlovid)

- Approved for mild-to-moderate COVID-19
- Boxed Warning: Screening for drug interactions is important
- Dosage based on kidney function
- Duration of treatment: 5 days

Remdesivir (Veklury)

- Treatment should be initiated as soon as possible after diagnosis
- Monitor liver function tests before starting and as clinically appropriate
- 3-day weight-based IV treatment

Molnupiravir (Lagevrio)

- Not authorized for use under 18 years of age
- Use with caution in pregnant women or females of child-bearing age
- For use only when Paxlovid and Remdesivir are not available

Always refer to the latest information as restrictions and treatment guidance may change rapidly

EUA: emergency use authorization
https://www.fda.gov/emergency-preparedness-and-response/mcm-legal-regulatory-and-policy-framework/emergency-use-authorization#coviddrugs
Please refer to individual prescribing information at https://dailymed.nlm.nih.gov/dailymed/
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Respiratory Syncytial Virus (RSV)

Respiratory Syncytial Virus (RSV)

A single strand RNA, envelope virus

- Transmitted through breathing in or touching virus particles
  - Virus can survive on hard surfaces for many hours
- Someone infected with RSV can become contagious 1 to 2 days before showing symptoms and usually lasts for 3 to 8 days
  - Infants and people with weakened immune systems can spread the virus even after they stop showing symptoms for up to 4 weeks

CDC recommends adults 75 years of age and older receive a single dose of RSV vaccine

CDC recommends adults 60 to 74 years of age who are at increased risk of severe RSV disease receive a single dose of RSV vaccine

Adults 60 to 74 years old who may be at increased risk:

- Chronic lung diseases (e.g., COPD, asthma)
- Chronic cardiovascular diseases (e.g., congestive heart failure and coronary artery disease)
- Immunocompromising conditions
- Blood disorders
- Residents of nursing homes and other long-term care facilities
- Endocrine disorders (e.g., diabetes)
- Kidney disorders
- Liver disorders
- Severe obesity (BMI ≥ 40)
- Other underlying conditions that the provider determines might increase risk of severe respiratory illness
- Neurologic disorders

BMI = body mass index

https://www.cdc.gov/rsv/
Britton A et al. Use of respiratory syncytial virus vaccines in adults aged ≥60 years: Updated recommendation of the Advisory Committee on Immunization Practices – United States, 2024. MMWR. 2024. 73.

Respiratory Syncytial Virus (RSV)

Complications

- Causes more severe infections
  - Bronchiolitis
  - Pneumonia
- Worsen current conditions
  - Asthma
  - Chronic obstructive pulmonary disease (COPD)
  - Congestive heart failure

Presentation

- Usually show symptoms within 4 to 6 days after getting infected
  - Runny nose
  - Decrease in appetite
  - Coughing
  - Sneezing
  - Fever
  - Wheezing

Treatment

- No specific treatment for the virus
- Relieve symptoms
  - Manage fever and pain
  - Drink fluids

https://www.cdc.gov/rsv/

Respiratory Syncytial Virus Vaccines

Arexvy

Adjuvanted, recombinant vaccine
Indicated only in adults 60 years and older

For adults, administer 0.5 mL intramuscularly
Requires reconstitution prior to injection

Storage: Refrigerate prior to reconstitution
Can be kept for up to 4 hours after mixing at room temperature or refrigeration

Abrysvo

Recombinant vaccine
Indicated only in adults 60 years and older

For adults, administer 0.5 mL intramuscularly
Requires reconstitution prior to injection

Storage: Refrigerate prior to reconstitution
Can be kept for up to 4 hours after mixing at room temperature

mResvia

Recombinant vaccine
Indicated only in adults 60 years and older

For adults, administer 0.5 mL intramuscularly

Storage: Refrigerate for up to 30 days prior to use
Can be kept for up to 24 hours at 46°F to 77°F

Please refer to the individual prescribing information at https://dailymed.nlm.nih.gov/dailymed/.
This slide contains references to brand-name prescription drugs that are trademarks or registered trademarks of pharmaceutical manufacturers not affiliated with CVS Health

Respiratory Syncytial Virus Vaccine Adverse Effects

Mild/Local

- Pain, swelling or redness at injection site
- Fatigue
- Muscle pain
- Headache

Severe/Systemic (very rare)

- On-going studies
- Guillain-Barré Syndrome has been reported

Please refer to the individual prescribing information at https://dailymed.nlm.nih.gov/dailymed/.

Herpes Zoster (Shingles)

Herpes Zoster ("Zoster" or Shingles)

Results from reactivation of varicella-zoster virus (VZV – aka "Chickenpox") decades after initial VZV infection

Frequently painful disease marked by a blistering rash

Pain can be mild to severe and may occur just prior to development of the rash, during the rash, and/or as postherpetic neuralgia (which may persist for months or years)

- It is not necessary to ask a patient about their history of varicella (chickenpox) or to conduct serologic testing for varicella immunity
- Age is the most important risk factor due to decreasing immune response
- Without vaccination 50% of persons living until age 85 years will develop zoster

https://www.cdc.gov/shingles/
https://www.cdc.gov/pinkbook/hcp/table-of-contents/

Herpes Zoster ("Zoster" or Shingles)

Without vaccination, almost 1 in 3 persons will develop herpes zoster

- Up to 1 million episodes in the U.S. annually
- Most have only 1 episode in a lifetime, but may develop it more than once
- 10 to 18% of people will develop postherpetic neuralgia

Those with suppressed immune systems are at greater risk including those:

- With cancer, especially leukemia and lymphoma
- With human immunodeficiency virus
- Taking immunosuppressive medications (e.g., corticosteroids, chemotherapy, or transplant-related immunosuppressive medications)

https://www.cdc.gov/shingles/
https://www.cdc.gov/pinkbook/hcp/table-of-contents/

Shingles Signs and Symptoms

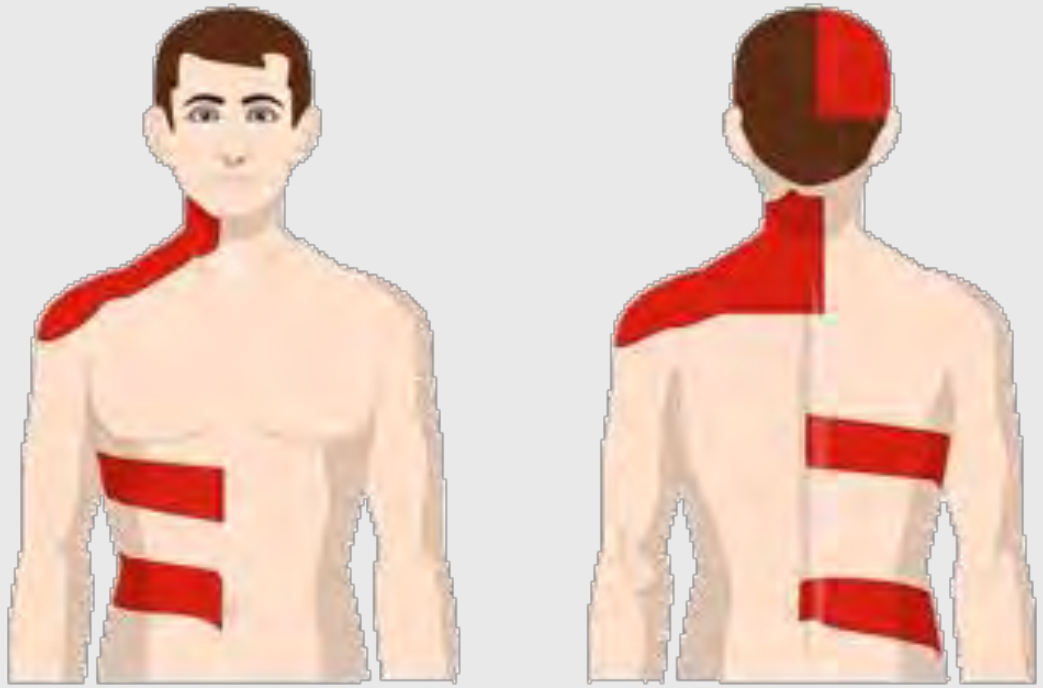
Painful rash typically on one side of the face or body

- Blisters usually scab over in 7 to 10 days and clear up in 2 to 4 weeks

Other symptoms may include:

- Fever
- Headache
- Chills
- Upset stomach

Common sites of shingles



Front Back

https://www.cdc.gov/shingles/
https://theimmunizationpartnership.files.wordpress.com/2013/04/shingles_rash_default.jpg

Serious Complications of Herpes Zoster

- Postherpetic neuralgia (10-18%)
- Skin discoloration and scarring
- Bacterial superinfection (e.g., MRSA)
- Cranial and peripheral nerve palsies
- Pneumonia
- Encephalitis
- Hepatitis
- Visual and/or hearing impairment
- Death

MRSA: methicillin-resistant Staphylococcus aureus
https://www.cdc.gov/shingles/hcp/clinical-overview/index.html
https://www.cdc.gov/shingles/about/complications.html

Is Herpes Zoster ("Zoster" or Shingles) Contagious?

No, but zoster lesions contain high concentrations of VZV that can be spread and can cause primary varicella in exposed, susceptible persons
(e.g., someone who has never had "chickenpox" or never been vaccinated for "chickenpox")

Localized zoster is only contagious after the rash erupts and only until the lesions crust

Less contagious than varicella

VZV: varicella-zoster virus
https://www.cdc.gov/shingles/
https://www.cdc.gov/pinkbook/hcp/table-of-contents/

Herpes Zoster Vaccine (Shingrix) Dosing, Storage, and Administration Recommendations

- Recombinant, adjuvanted vaccine
- Does NOT contain a preservative
- Store vaccine and adjuvant suspension vials in refrigerator between 36ºF and 46ºF (2ºC to 8ºC). Do not freeze.
  - Stable in the refrigerator for up to 6 hours after reconstitution
- Administer 0.5 mL intramuscularly in the deltoid region of the upper arm
- Adverse effects include pain, redness, or swelling at injection site, fatigue, shivering, headache, fever, nausea and muscle aches

HERPES ZOSTER VACCINE DOSING SCHEDULE

Dose	When
1st	50 years of age and older
2nd	2 to 6 months after 1st dose
• Two doses are 97% effective if 50 to 69 years old • Two doses are 91% effective if 70 years and older	

https://www.cdc.gov/vaccines/vpd/shingles/index.html
Please refer to the individual prescribing information at https://dailymed.nlm.nih.gov/dailymed/.
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Herpes Zoster Vaccine (Shingrix) In Immunocompromised Adults

Approved for the prevention of shingles in adults 19 years and older who are or who will be at increased risk of shingles due to immunodeficiency or immunosuppression (e.g., HIV, solid tumors, kidney or stem cell transplants)

Immunocompromised adults are at increased risk for herpes zoster and related complications compared to general population

- Effective preventative vaccine may decrease the need for time-sensitive antiviral medication and use of medications for pain control

HERPES ZOSTER VACCINE DOSING SCHEDULE (for immunocompromised adults)

Dose	When
1st	19 years of age and older
2nd	1 to 2 months after 1st dose
Immunocompromised adults have a shorter immunization schedule	

https://www.cdc.gov/vaccines/vpd/shingles/index.html
Please refer to the individual prescribing information at https://dailymed.nlm.nih.gov/dailymed/.
This slide contains references to brand-name prescription drugs that are trademarks or registered trademarks of pharmaceutical manufacturers not affiliated with CVS Health

Herpes Zoster Vaccine Recommendations

Not indicated for:

- Treatment of acute zoster
- Prevention of PHN in those with acute zoster
- Treatment of ongoing PHN
- Prevention of primary varicella infection (chickenpox)

Do not administer to anyone:

- With a history of severe, life-threatening allergies to any vaccine component
- Who are moderately or severely ill
- Who currently has shingles
- Who tested negative for immunity to VZV
- Who are pregnant

PHN: postherpetic neuralgia; VZV: varicella-zoster virus
https://www.cdc.gov/shingles/vaccination.html
https://www.cdc.gov/vaccines/vpd/shingles/hcp/shingrix/recommendations.html
Please refer to the individual prescribing information at https://dailymed.nlm.nih.gov/dailymed/.

Herpes Zoster ("Zoster" or Shingles) Treatment

Three antiviral drugs are approved for treatment of zoster in immunocompetent patients

Should be started as soon as possible after rash appears (best within 72 hours)

- Zovirax (acyclovir)
- Famvir (famciclovir)
- Valtrex (valacyclovir)

Adequate pain control is very important

May include acetaminophen, NSAID, tricyclic antidepressants, opioids, anticonvulsants, and/or topical anesthetics

NSAID: nonsteroidal anti-inflammatory drugs

Saguil A et al. Herpes zoster and postherpetic neuralgia: Prevention and management. Am Fam Physician. 2017; 96(10):656-663.
https://www.cdc.gov/shingles/about/

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Tetanus

Tetanus and Diphtheria

Tetanus

- *Clostridium tetani*
  - Anaerobic, Gram-positive rod
  - Survives in spore form
- Also called “lockjaw”
- Spores thrive in soil and manure
- Overall fatality rate is about 11%
  - Adults **55** years of age and older and those who are unvaccinated are most likely to have fatal cases

Diphtheria

- *Corynebacterium diphtheriae*
  - Aerobic, Gram-positive bacillus
  - Toxin producing
- Spreads by respiratory droplets
- Most common in winter and spring
- Overall fatality rate is 5 to 10%

https://www.cdc.gov/pinkbook/hcp/table-of-contents/
https://www.cdc.gov/vaccines/pubs/surv-manual/chpt01-dip.html
https://www.cdc.gov/vaccines/pubs/surv-manual/chpt16-tetanus.html

Tetanus and Diphtheria

Tetanus Toxin

- Enter through wounds or breaks in the skin. Spores then germinate in anaerobic wounds and travel through the blood and lymphatic system to the central nervous system
  - Interfere with release of neurotransmitters
- Incubation time ranges from 1 to 21 days (average 8 days)
- Common presentation: lockjaw, stiff neck, difficulty swallowing, rigidity of abdominal muscles, fever, sweating, increased blood pressure, increased pulse, and spasms

Diphtheria Toxin

- Absorbed through mucous membranes into bloodstream and spreads to tissues and organs
  - May cause breathing problems, paralysis, heart failure, and even death
- Incubation time ranges from 1 to 10 days (usually 2 to 5 days)
- Symptoms may include fever, sore throat, nasal discharge, membranes in the mouth or throat, or scaly rash
  - Complications may include heart muscle damage, nerve damage, or paralysis
- Treatment includes diphtheria antitoxin and erythromycin or benzathine penicillin G

https://www.cdc.gov/pinkbook/hcp/table-of-contents/

Tetanus Complications and Treatment

Complications

- Spasms of the vocal cords
- Fractures of spine/long bones
- High blood pressure and heart arrhythmias
- Pulmonary embolism
- Aspiration pneumonia
- Respiratory failure
- Death

Treatment

- Clean wounds
- Provide supportive therapy/stabilize complications
  - Sedation and muscle relaxants if necessary
- Active immunization
- Tetanus immune globulin (TIG) (HyperTET)

Actively vaccinate individuals who

- Sustain wounds which are minor and uncontaminated if they have not received tetanus toxoid in the preceding 10 years
- Have tetanus prone wounds (e.g., puncture wounds, crush wounds, wounds contaminated with dirt, feces, soil, or saliva) who have not received tetanus toxoid in the preceding 5 years

https://www.cdc.gov/pinkbook/hcp/table-of-contents/

Tetanus and Diphtheria Vaccines

DTaP

- Contains diphtheria, tetanus, and pertussis
  - Contains equal amounts of tetanus toxins but 3 to 4 times more diphtheria toxins than in adult formulations
- 4 or 5 dose series for children depending on when dose 4 was administered
- DT (diphtheria/tetanus) is available for children who cannot tolerate pertussis vaccine

Td

- Contains diphtheria and tetanus
- For adolescents and adults as a booster shot every 10 years
  - May use Tdap instead

Tdap

- Contains tetanus, diphtheria, and pertussis
- For adolescents and adults as a booster shot every 10 years
  - May use Td if one dose of Tdap has been received
- Women should receive 1 dose during every pregnancy (preferably in the 3rd trimester)

Uppercase letters denote full-strength doses (e.g., D,T and P in DTaP); Lowercase letters denote reduced doses (e.g., d and p in Tdap); a refers to acellular
https://www.cdc.gov/pinkbook/hcp/table-of-contents/
https://www.immunize.org/askexperts/experts_per.asp

DTaP and Td Dosing Recommendations

DTaP DOSING RECOMMENDATIONS FOR CHILDREN

Dose	When
1st	2 months old
2nd	4 months old
3rd	6 months old
4th	15 to 18 months old
5th	4 to 6 years old

Td or Tdap DOSING RECOMMENDATIONS FOR ADULTS WHO LACK CHILDHOOD IMMUNIZATIONS*

Dose	When
1st	—
2nd	4 weeks after the 1st dose
3rd	6 to 12 months after the 2nd dose
EVERYONE should receive a booster shot every 10 years after the age of 12 years	

*As part of the catch-up series, at least 1 dose of Tdap should be administered (preferred as first dose); if additional doses are needed, may use Td or Tdap

- Shake well before administering
- Administer IM only
- Store in refrigerator until ready to administer

Centers for Disease Control and Prevention. Recommended Adult Immunization Schedule for ages 19 years or older, United States, 2024. https://www.cdc.gov/vaccines/schedules/hcp/imz/adult.html.
Centers for Disease Control and Prevention. Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2024. https://www.cdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html.
Please refer to the individual prescribing information at https://dailymed.nlm.nih.gov/dailymed/.

Td Adverse Effects

Local

- Redness, swelling, and/or pain at injection site (no treatment required)
- Exaggerated local (“Arthus-like”) reactions
  - Extensive painful swelling (from shoulder to elbow)
  - Generally begins 2 to 8 hours after injection

Severe/Systemic (very rare)

- Generalized hives, anaphylaxis, or neurological complications
- Guillain-Barré Syndrome and peripheral neuropathy have been documented

https://www.cdc.gov/pinkbook/hcp/table-of-contents/

Hepatitis B

Hepatitis B Virus (HBV)

A Small, Double-shelled Virus

- Transmitted through blood and body fluids from infected person to non-immune person
- Has been shown to remain infectious outside the body for at least 7 days at room temperature, even in the absence of visible blood

CDC recommends hepatitis B vaccination in all adults aged 19 to 59 years old and for those above the age of 60 with additional risk factors

Risk Groups who should be Vaccinated

- Persons with multiple sex partners or sex with an infected person or men with men
- IV drug users (share needles)
- Diabetics under 60 years of age*
- Persons with HIV
- Persons with end-stage kidney disease
- Persons with hepatitis C or chronic liver disease
- International travelers to regions with high prevalence of HBV infection
- Incarcerated persons
- Infants born to infected mothers
- Household contacts of infected persons
- Residents and staff of facilities for developmentally disabled persons
- Health care/public safety workers who are potentially exposed to blood or other infectious body fluids

HCV: hepatitis C virus; HIV: human immunodeficiency virus
*People with diabetes 60 years or older may be vaccinated at the discretion of their prescriber
https://www.cdc.gov/pinkbook/hcp/table-of-contents/
Weng MK et al. Universal Hepatitis B Vaccination in Adults Aged 19–59 Years: Updated Recommendations of the Advisory Committee on Immunization Practices. MMWR. 2022;71:477–483.

Hepatitis B Virus (HBV)

Complications

- Causes acute and chronic diseases
  - Chronic hepatitis
  - Cirrhosis
  - Liver cancer

Presentation

- Incubation period
  - 60 to 90 days
  - Up to 50% of patients show no signs or symptoms
  - Others have: jaundice, fever, abdominal pain, nausea, loss of appetite, light or gray stools, dark urine, and hepatomegaly

Treatment

- interferon alfa-2b
- pegylated interferon alfa-2a
- entecavir
- tenofovir

Terrault NA et al. Update on prevention, diagnosis, and treatment of chronic hepatitis B: AASLD 2018 hepatitis B guidance. Hepatology. 2018; 67(4):1560-1599.
https://www.cdc.gov/pinkbook/hcp/table-of-contents/

Hepatitis B Vaccines*

Engerix-B or Recombivax HB

- Recombinant vaccines with aluminum adjuvant
  - Pediatric and adult formulations
  - Those on dialysis require a higher 40 mcg dose (and an extra dose if using Engerix-B)
- For adults, administer 1 mL intramuscularly in the deltoid
  - May give subcutaneously if at risk of hemorrhage (e.g., hemophilia)

Heplisav-B

- Recombinant vaccine with novel adjuvant†
  - Only approved for adults 18 years and older
  - Safety and effectiveness have not been established in adults on hemodialysis
  - No clinical studies have been performed in pregnant women
- Administer 0.5 mL intramuscularly in the deltoid

PreHevbrio

- Recombinant vaccine with aluminum adjuvant
  - Only approved for adults 18 years and older
  - Safety and effectiveness have not been established in adults on hemodialysis
  - No clinical studies have been performed in pregnant women
- Administer 1 mL intramuscularly in the deltoid

*Twinrix, a combination of hepatitis A and B vaccines, is available (for adults 18 years of age and older)
† cytosine phosphoguanine (CpG) 1018 adjuvant
Please refer to the individual prescribing information at https://dailymed.nlm.nih.gov/dailymed/.
This slide contains references to brand-name prescription drugs that are trademarks or registered trademarks of pharmaceutical manufacturers not affiliated with CVS Health

Hepatitis B Vaccine Dosing Schedules for Adults*

Engerix-B, 20 mcg (1 mL) / dose

Dose	When
1st	—
2nd	At least 28 days following 1st dose
3rd	6 months after the 1st dose

Recombivax HB, 10 mcg (1 mL) / dose

Dose	When
1st	—
2nd	At least 28 days following 1st dose
3rd	6 months after the 1st dose

PreHevbrio, 10 mcg (1 mL) / dose

Dose	When
1st	—
2nd	At least 28 days following 1st dose
3rd	6 months after the 1st dose

Heplisav-B, 20 mcg (0.5 mL) / dose

Dose	When
1st	—
2nd	At least 28 days following 1st dose

Heplisav-B achieved adequate antibody protection in 90 to 100% of subjects compared to 70.5 to 90.2% with Engerix-B

*Dialysis patients may require a higher dose and an extra dose based upon prescriber's guidance
Please refer to the individual prescribing information at https://dailymed.nlm.nih.gov/dailymed/.
Schillie S et al. Recommendations of the Advisory Committee on Immunization Practices for use of a hepatitis B vaccine with a novel adjuvant. MMWR. 2018; 67(15):455-458.
This slide contains references to brand-name prescription drugs that are trademarks or registered trademarks of pharmaceutical manufacturers not affiliated with CVS Health

Hepatitis B Vaccine Adverse Effects

Mild/Local

- Pain, swelling or redness at injection site
- Fever
- Headache

Severe/Systemic (very rare)

- Hives, swelling of the face and throat, difficulty breathing, tachycardia, dizziness, weakness
- Guillain-Barré Syndrome, chronic fatigue syndrome, neurologic disorders, rheumatoid arthritis, Type 1 diabetes, autoimmune disease

CDC: Centers for Disease Control and Prevention
https://www.cdc.gov/pinkbook/hcp/table-of-contents/
Schillie S et al. Recommendations of the Advisory Committee on Immunization Practices for use of a hepatitis B vaccine with a novel adjuvant. MMWR. 2018; 67(15):455-458.

Mumps, Measles, Rubella (MMR)

Measles, Mumps and Rubella (MMR) – Complications

Measles (Rubeola)

- Ear infections
- Diarrhea
- Pneumonia
- Encephalitis
- Neurological damage
- Seizures

Mumps

- Pain and swelling of the testes, ovaries, or breast tissue
- Deafness
- Pancreatitis
- Meningitis
- Encephalitis

Rubella (German Measles)

- Joint pain (mostly in women)
- Encephalitis
- Increased risk of bleeding or bruising
- Miscarriage or birth defects
- Pain and swelling of the testes **(rare)**
- Nerve inflammation **(rare)**

https://www.cdc.gov/measles/
https://www.cdc.gov/mumps/
https://www.cdc.gov/rubella/
https://www.cdc.gov/pinkbook/hcp/table-of-contents/

Ensuring Evidence of Immunity to Measles for Health Care Personnel

Documentation of vaccination with 2 doses of measles virus-containing vaccine	**Laboratory evidence of immunity** (e.g., measles immunoglobulin G)	**History of laboratory-confirmed measles**	**Born before 1957**

During an outbreak, all health care personnel should receive 2 doses of measles virus-containing vaccine regardless of year of birth

https://www.cdc.gov/infection-control/hcp/measles/

MMR Vaccine Live* (M-M-R II) Dosing, Storage and Administration Recommendations

- Does NOT contain a preservative
- A live virus vaccine that must be protected from light and stored between -58°F and +46°F (-50°C to +8°C) until ready to reconstitute
  - Do NOT freeze the diluent
- After reconstituting, gently agitate to mix thoroughly
  - Discard reconstituted vaccine if not protected from light, not refrigerated, not fully dissolved, or not used within 8 hours after reconstitution
- Administer 0.5 mL subcutaneously in the outer aspect of the upper arm or the anterolateral thigh
  - Should be given 1 month before or after administration of any other live virus vaccines

MMR VACCINE DOSING SCHEDULE

Dose	When
1st	12 to 15 months of age
2nd	4 to 6 years of age (or at least 28 days following 1st dose)

Two doses are 97% and 88% effective at preventing measles and mumps respectively

*Proquad, a combination measles, mumps, rubella, and varicella (MMRV) vaccine is also available (for children 12 months to 12 years of age)
https://www.cdc.gov/vaccines/vpd/mmr/public/index.html
Please refer to the individual prescribing information at https://dailymed.nlm.nih.gov/dailymed/.
This slide contains references to brand-name prescription drugs that are trademarks or registered trademarks of pharmaceutical manufacturers not affiliated with CVS Health

MMR Vaccine Live* Adverse Effects

Mild

- Fever
- Injection site pain
- Mild rash
- Swelling of glands in the cheek or neck

Moderate

- Seizures
- Temporary joint pain/ stiffness
- Pneumonia
- Increased risk of bleeding or bruising
- Full body rash

Severe (very rare)

- Anaphylaxis
- Deafness
- Coma
- Permanent brain damage

*Proquad, a combination measles, mumps, rubella, and varicella (MMRV) vaccine is associated with a greater risk of fever, rash, and seizure

CDC. MMR vaccine – What you need to know. Vaccine Information Sheet. 2021 Aug.
https://www.cdc.gov/pinkbook/hcp/table-of-contents/

Varicella

Varicella (Chickenpox)

Caused by the varicella zoster virus, which causes fever and an itchy rash

Highly contagious and spread by touching or breathing in the virus particles from the chickenpox blisters

Symptoms typically involve blister-like lesions, covering the body, but usually more concentrated on the face and trunk

Fever and malaise often appear just before or when the rash appears in adults

A person with chickenpox is contagious 1 to 2 days before the rash appears and until no new lesions have appeared in the past 24 hours and all blisters have formed scabs

It takes 10 to 21 days after exposure for someone to develop chickenpox

https://www.cdc.gov/chickenpox/
https://www.cdc.gov/pinkbook/hcp/table-of-contents/

Varicella (Chickenpox)

Before the Vaccine

- About 4 million cases annually
  - Mostly children
- More than 10,000 hospitalizations each year
- Up to 150 deaths each year

After the Vaccine

- Less than 150,000 cases annually
- About 1,400 hospitalizations each year
- Fewer than 30 deaths per year

Two doses of vaccine are 92% effective at preventing any form of varicella

https://www.cdc.gov/chickenpox/images/vaccine-infographic-lg.jpg
https://www.cdc.gov/vaccines/vpd/varicella/hcp/about-vaccine.html

Serious Complications of Varicella

Scarring and skin and soft tissue infections

Pneumonia (usually viral)

Bleeding problems and bloodstream infections

Inflammation of the brain (e.g., loss of coordination)

Dehydration

https://www.cdc.gov/chickenpox/
https://www.cdc.gov/pinkbook/hcp/table-of-contents/

Varicella Virus Vaccine Live* (Varivax) Dosing, Storage, and Administration Recommendations

- Does NOT contain a preservative
- A live virus vaccine that must be protected from light and stored between -58ºF and +5ºF (-50ºC to -15ºC) until ready to reconstitute
  - May store vaccine between 36ºF and 46ºF (2ºC to 8ºC) for up to 72 hours prior to reconstitution. Administer within 30 minutes of reconstitution.
  - Store diluent at room temperature or refrigerate prior to mixing
- Administer 0.5 mL subcutaneously in the outer aspect of the upper arm or the anterolateral thigh
- Should be given 1 month before or after administration of any other live virus vaccines

VARICELLA VACCINE DOSING SCHEDULE

Dose	When
1st	12 to 15 months of age
2nd	4 to 6 years of age May give earlier but at least 3 months after the 1st dose

*Proquad, a combination measles, mumps, rubella, and varicella (MMRV) vaccine is also available (for children 12 months to 12 years of age)
https://www.cdc.gov/vaccines/vpd/varicella/public/index.html
Please refer to the individual prescribing information at https://dailymed.nlm.nih.gov/dailymed/.
This slide contains references to brand-name prescription drugs that are trademarks or registered trademarks of pharmaceutical manufacturers not affiliated with CVS Health.

Who Should Not Receive Varicella Vaccine?

- Have a history of anaphylactic or severe allergic reaction to gelatin, neomycin, or any other vaccine component
- Immunodeficient including history or primary or acquired immunodeficiency (e.g., HIV, leukemia, lymphomas, blood dyscrasia)
- Immunosuppressed/ receiving high-dose corticosteroid (e.g., prednisone 20 mg or more)
- Have active, untreated tuberculosis
- Have any febrile illness
- Had a blood transfusion or immune globulin therapy in the past 11 months
- Is or may be pregnant

https://www.cdc.gov/vaccines/vpd/varicella/hcp/recommendations.html
Please refer to the individual prescribing information at https://dailymed.nlm.nih.gov/dailymed/.

Varicella Virus Vaccine Live* Adverse Effects

Mild

- Soreness or swelling at injection site (up to 1 in 4 persons)
- Fever (10-15%)
- Mild rash, up to a month after vaccination (up to 6%)

Moderate

Seizures caused by fever

Severe (rare)

- Pneumonia
- Infection of the brain/spinal cord

*Proquad, a combination measles, mumps, rubella, and varicella (MMRV) vaccine is associated with a greater risk of fever, rash, and seizure

CDC. Varicella (Chickenpox) vaccine: What you need to know. Vaccine Information Sheet. 2021 Aug.
https://www.cdc.gov/pinkbook/hcp/table-of-contents/

This slide contains references to brand-name prescription drugs that are trademarks or registered trademarks of pharmaceutical manufacturers not affiliated with CVS Health.

Rules and Regulations

F883 – Influenza and Pneumococcal Immunizations

Each facility must develop policies and procedures to ensure:

Education is given to residents or their legal representative about benefits and potential side effects of the immunization(s)

Influenza immunization is offered October 1 through March 31 annually, AND pneumococcal immunization is offered, unless the immunization is medically contraindicated, or the resident has already been immunized

Residents or their legal representative have the opportunity to refuse immunization

- May use standing orders for vaccination (if allowed by state and local law)
- Must document that education was provided and whether immunizations were received or refused or medically contraindicated
- Self-reporting of immunization is ONLY permitted for influenza vaccine and PPSV23

PPSV23: 23-valent pneumococcal polysaccharide vaccine

Centers for Medicare and Medicaid Services. State operations manual. Appendix PP: Guidance to surveyors for long term care facilities, F883/483.80 Influenza and pneumococcal immunizations. 2024.

F883 – Influenza and Pneumococcal Immunizations: General Guidance

Vaccinations and facility policies should be in accordance with national (e.g., ACIP) recommendations

When a “precaution” exists that might delay vaccination, the benefits and risks of vaccination should be discussed with the resident (or resident representative) and the vaccine may still be administered if the benefit outweighs the risk, consent is obtained, and the physician approves

Per CDC guidance, influenza vaccine should be administered annually when it becomes available to the facility

Residents should receive pneumococcal vaccinations based upon CDC recommendations

ACIP: Advisory Committee on Immunization Practices; CDC: Centers for Disease Control and Prevention

Centers for Medicare and Medicaid Services. State operations manual. Appendix PP: Guidance to surveyors for long term care facilities, F883/483.80 Influenza and pneumococcal immunizations. 2024.

F883 – Influenza and Pneumococcal Immunizations: Addressing the Possibility of a National Shortage

Demonstrate vaccine was ordered and confirmation was received indicating it has shipped or will be shipped when supply is available

Plans are developed on how and when the vaccines are to be administered when available

Residents were screened to determine how many and who are eligible and wish to receive the vaccine

Education regarding immunizations has been implemented

Centers for Medicare and Medicaid Services. State operations manual. Appendix PP: Guidance to surveyors for long term care facilities, F883/483.80 Influenza and pneumococcal immunizations. 2024.

Federal Law: Vaccine Information Statements (VIS)

VIS provide information to properly inform the adult vaccine recipient or the minor child's parent or legal representative about the benefits and risks of each vaccine

Federal law requires that health care personnel provide VIS prior to administration of all the vaccines in the table to the right

Available for free at:
https://www.cdc.gov/vaccines/hcp/vis/current-vis.html

May provide a paper copy, a permanent laminated copy, or on a computer monitor, video display, or other digital device

REQUIRE VIS DISTRIBUTION

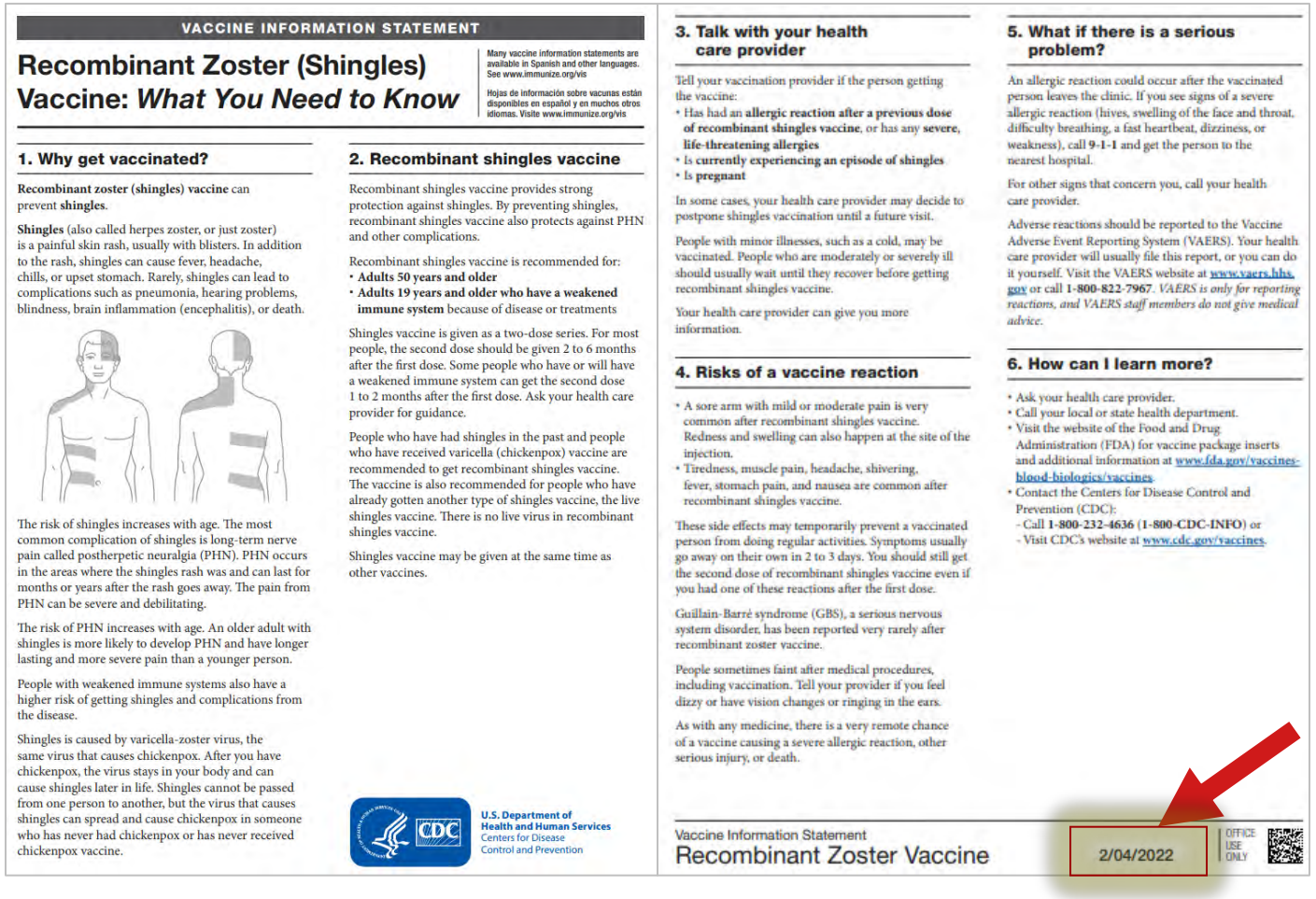
- Diphtheria
- Tetanus
- Pertussis
- Measles
- Mumps
- Rubella
- Polio
- Rotavirus
- Hepatitis A
- Hepatitis B
- *Haemophilus influenzae* type b
- Influenza (inactivated or live)
- Pneumococcal conjugate
- Meningococcal
- Human Papillomavirus
- Varicella

Although not required by law, VIS are available and recommended for COVID-19 vaccines, pneumococcal polysaccharide vaccine, respiratory syncytial virus vaccines, zoster (shingles) vaccines, etc.

VIS: vaccine information statements
https://www.cdc.gov/vaccines/hcp/vis/about/facts-vis.html

Vaccine Information Statements

1. Give/display a copy of most current VIS prior to any vaccination
2. Give time to read the VIS and ask any questions
3. Record in the chart the date the VIS was given
4. Record in the chart the date of the VIS given (see bottom of VIS)



VACCINE INFORMATION STATEMENT

Recombinant Zoster (Shingles) Vaccine: *What You Need to Know*

Many vaccine information statements are available in Spanish and other languages. See www.immunize.org/vis

Hojas de información sobre vacunas están disponibles en español y en muchos otros idiomas. Visite www.immunize.org/vis

1. Why get vaccinated?

Recombinant zoster (shingles) vaccine can prevent **shingles**.

Shingles (also called herpes zoster, or just zoster) is a painful skin rash, usually with blisters. In addition to the rash, shingles can cause fever, headache, chills, or upset stomach. Rarely, shingles can lead to complications such as pneumonia, hearing problems, blindness, brain inflammation (encephalitis), or death.

The risk of shingles increases with age. The most common complication of shingles is long-term nerve pain called postherpetic neuralgia (PHN). PHN occurs in the areas where the shingles rash was and can last for months or years after the rash goes away. The pain from PHN can be severe and debilitating.

The risk of PHN increases with age. An older adult with shingles is more likely to develop PHN and have longer lasting and more severe pain than a younger person.

People with weakened immune systems also have a higher risk of getting shingles and complications from the disease.

Shingles is caused by varicella-zoster virus, the same virus that causes chickenpox. After you have chickenpox, the virus stays in your body and can cause shingles later in life. Shingles cannot be passed from one person to another, but the virus that causes shingles can spread and cause chickenpox in someone who has never had chickenpox or has never received chickenpox vaccine.

2. Recombinant shingles vaccine

Recombinant shingles vaccine provides strong protection against shingles. By preventing shingles, recombinant shingles vaccine also protects against PHN and other complications.

Recombinant shingles vaccine is recommended for:
- **Adults 50 years and older**
- **Adults 19 years and older who have a weakened immune system** because of disease or treatments

Shingles vaccine is given as a two-dose series. For most people, the second dose should be given 2 to 6 months after the first dose. Some people who have or will have a weakened immune system can get the second dose 1 to 2 months after the first dose. Ask your health care provider for guidance.

People who have had shingles in the past and people who have received varicella (chickenpox) vaccine are recommended to get recombinant shingles vaccine. The vaccine is also recommended for people who have already gotten another type of shingles vaccine, the live shingles vaccine. There is no live virus in recombinant shingles vaccine.

Shingles vaccine may be given at the same time as other vaccines.

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

3. Talk with your health care provider

Tell your vaccination provider if the person getting the vaccine:
- Has had an **allergic reaction after a previous dose of recombinant shingles vaccine**, or has any **severe, life-threatening allergies**
- Is **currently experiencing an episode of shingles**
- Is **pregnant**

In some cases, your health care provider may decide to postpone shingles vaccination until a future visit.

People with minor illnesses, such as a cold, may be vaccinated. People who are moderately or severely ill should usually wait until they recover before getting recombinant shingles vaccine.

Your health care provider can give you more information.

4. Risks of a vaccine reaction

- A sore arm with mild or moderate pain is very common after recombinant shingles vaccine. Redness and swelling can also happen at the site of the injection.
- Tiredness, muscle pain, headache, shivering, fever, stomach pain, and nausea are common after recombinant shingles vaccine.

These side effects may temporarily prevent a vaccinated person from doing regular activities. Symptoms usually go away on their own in 2 to 3 days. You should still get the second dose of recombinant shingles vaccine even if you had one of these reactions after the first dose.

Guillain-Barré syndrome (GBS), a serious nervous system disorder, has been reported very rarely after recombinant zoster vaccine.

People sometimes faint after medical procedures, including vaccination. Tell your provider if you feel dizzy or have vision changes or ringing in the ears.

As with any medicine, there is a very remote chance of a vaccine causing a severe allergic reaction, other serious injury, or death.

5. What if there is a serious problem?

An allergic reaction could occur after the vaccinated person leaves the clinic. If you see signs of a severe allergic reaction (hives, swelling of the face and throat, difficulty breathing, a fast heartbeat, dizziness, or weakness), call **9-1-1** and get the person to the nearest hospital.

For other signs that concern you, call your health care provider.

Adverse reactions should be reported to the Vaccine Adverse Event Reporting System (VAERS). Your health care provider will usually file this report, or you can do it yourself. Visit the VAERS website at www.vaers.hhs.gov or call **1-800-822-7967**. *VAERS is only for reporting reactions, and VAERS staff members do not give medical advice.*

6. How can I learn more?

- Ask your health care provider.
- Call your local or state health department.
- Visit the website of the Food and Drug Administration (FDA) for vaccine package inserts and additional information at www.fda.gov/vaccines-blood-biologics/vaccines.
- Contact the Centers for Disease Control and Prevention (CDC):
  - Call **1-800-232-4636** (**1-800-CDC-INFO**) or
  - Visit CDC's website at www.cdc.gov/vaccines.

Vaccine Information Statement
Recombinant Zoster Vaccine

2/04/2022

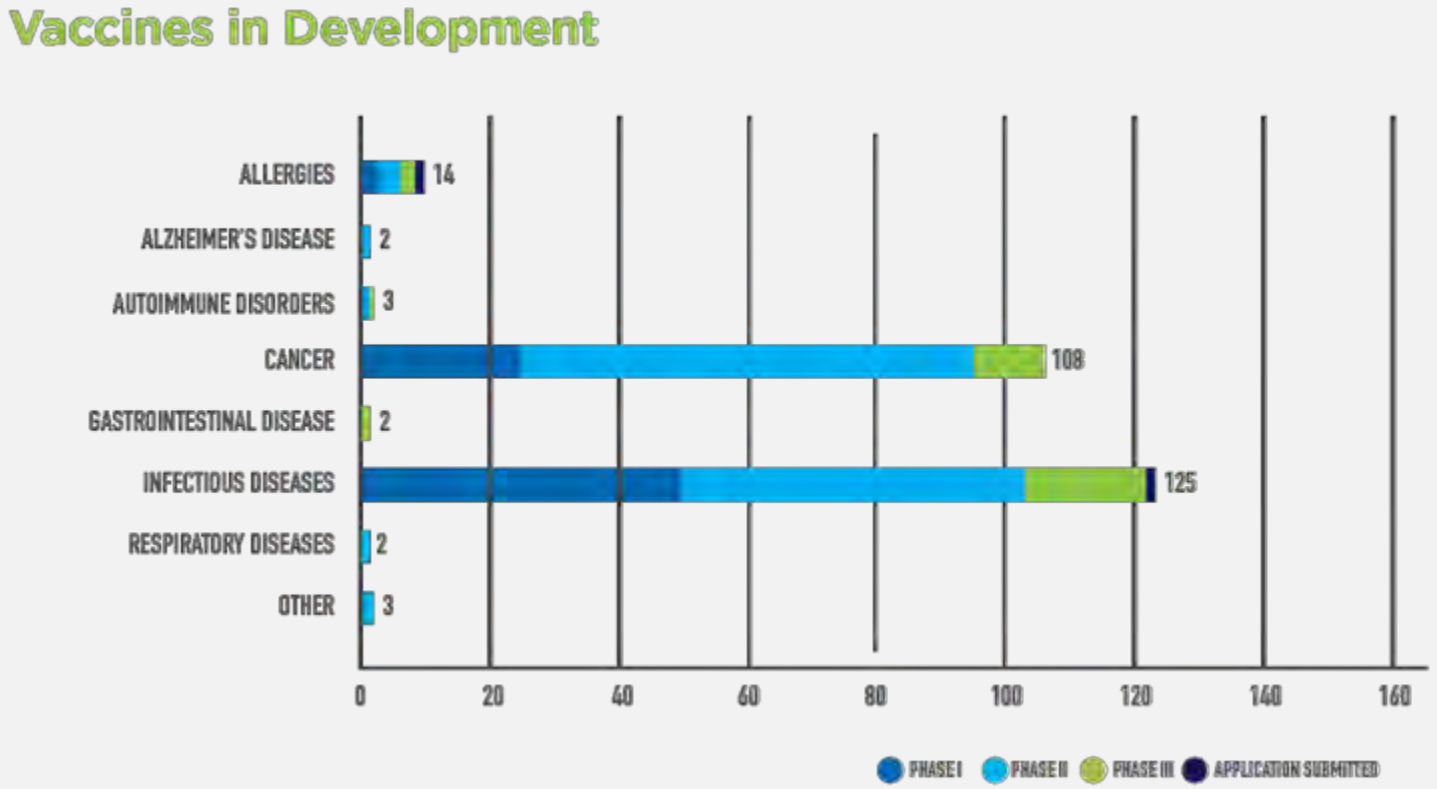
OFFICE USE ONLY

VIS: vaccine information statements
https://www.cdc.gov/vaccines/hcp/vis/about/facts-vis.html
https://www.cdc.gov/vaccines/hcp/vis/current-vis.html

New Vaccine Development and Research

Specific examples

- HIV infection
- Non-small cell lung cancer
- Alzheimer’s disease
- Group B Streptococcus
- Malaria
- Norovirus
- Tuberculosis
- Universal influenza vaccine



https://phrma.org/report/medicines-in-development-for-vaccines-2020-report
https://www.who.int/teams/immunization-vaccines-and-biologicals/diseases

Understanding Other Vaccine Ingredients

TYPE OF INGREDIENT	EXAMPLES OF INGREDIENTS	PURPOSE	EXAMPLES OF VACCINES
Preservatives	Thimerosal (only in MDV)	Prevent contamination	Influenza MDV
Adjuvants	Aluminum salts, MF-59	Help boost the body's response to vaccines	Fluad, PCV15, PCV20, Shingrix, Tdap
Stabilizers	Sugars, gelatin, MSG	Protect vaccine potency during transportation and storage	FluMist, M-M-R II, Varivax
Residual Cell Culture Materials	Egg protein	Grow enough of the virus or bacteria to make a vaccine	All Influenza vaccines except Flublok and Flucelvax, Recombivax HB
Residual Inactivating Ingredients	Formaldehyde	Kill viruses or inactivate toxins during the manufacturing process	Td, Tdap
Residual Antibiotics	Neomycin, Polymyxin B, Gentamicin	Prevent bacterial contamination during the manufacturing process	Afluria, Fluad, Fluarix, FluMist, M-M-R II

MDV: multiple-dose vials; MSG: monosodium glutamate
http://www.cdc.gov/vaccines/vac-gen/additives.htm
http://www.fda.gov/BiologicsBloodVaccines/SafetyAvailability/VaccineSafety/ucm187810.htm
https://www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/b/excipient-table-2.pdf
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