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Contact Hours: **1**

Respiratory Viruses: 2023–2024 Vaccine Update

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LEARNING OUTCOME AND OBJECTIVES: Upon completion of this continuing education course, you will be able to discuss vaccine updates for respiratory viruses currently in circulation. Specific learning objectives to address potential knowledge gaps include:

- Identify changes made to the vaccine-related recommendations for influenza.
- Discuss the most current recommendations for COVID-19 vaccination.
- Explain the recommendations for pneumococcal vaccination.
- Discuss the newly approved vaccines for respiratory syncytial virus (RSV).

INTRODUCTION

The only certainty about any respiratory virus season is that it is unpredictable. Viruses continue to mutate, necessitating updated vaccines and boosters. It is therefore important for clinicians to receive information about the latest vaccine-related recommendations for influenza, COVID-19, pneumonia, and respiratory syncytial virus (RSV) infection.

INFLUENZA (FLU)

There are few changes to the influenza (flu) vaccination recommendations adopted by the Centers for Disease Control and Prevention (CDC) for the 2023–2024 season. The CDC recommends annual vaccination for **everyone 6 months of age and older** who does not have contraindications. For most persons who need only one dose of influenza vaccine for the season, vaccination should ideally be offered during September or October. However, vaccination should continue throughout the season as long as influenza viruses are circulating.

2023–24 Seasonal Flu Vaccine Recommendations

Flu viruses are continually changing. The composition of U.S. flu vaccines is reviewed annually by the U.S. Food and Drug Administration (FDA) Vaccines and Related Biological Products Advisory Committee and updated as needed to best match the flu viruses that research indicates will be most common during the upcoming season (CDC, 2023a). The composition of flu vaccines for the U.S. 2023–2024 season will contain the following:

Egg-based vaccines:

- An A/Victoria/4897/2022 (H1N1)pdm09-like virus **(updated)**
- An A/Darwin/9/2021 (H3N2)-like virus
- A B/Austria/1359417/2021 (B/Victoria lineage)-like virus
- A B/Phuket/3073/2013 (B/Yamagata lineage)-like virus

Cell- or recombinant-based vaccines:

- An A/Wisconsin/67/2022 (H1N1)pdm09-like virus **(updated)**
- An A/Darwin/6/2021 (H3N2)-like virus
- A B/Austria/1359417/2021 (B/Victoria lineage)-like virus
- A B/Phuket/3073/2013 (B/Yamagata lineage)-like virus

The main change in this season's flu vaccine recommendations is related to administering flu vaccine to people with **egg allergies**. Most flu vaccines today continue to be produced using an egg-based manufacturing process and therefore contain a small amount of egg proteins, such as ovalbumin. The Advisory Committee on Immunization Practices (ACIP) recommends that persons ages ≥6 months with egg allergy receive the influenza vaccine. Any influenza vaccine (egg-based or non-egg-based) that is otherwise appropriate for the recipient's age and health status can be used.

All vaccines should be administered in settings in which personnel and equipment needed for rapid recognition and treatment of acute hypersensitivity reactions are available. Egg allergy necessitates no additional safety measures for influenza vaccination beyond those recommended for any recipient of any vaccine, regardless of severity of previous reaction to egg (CDC, 2023a).

Persons who are **pregnant** or who might be pregnant during the influenza season should receive influenza vaccine. Any age-appropriate IIV4 or RIV4 may be given in any trimester. LAIV4 should not be used during pregnancy but can be used postpartum.

Approved **ages and dose volumes** for intramuscular influenza vaccines (IIV4s and RIV4) are listed in the table below.

INTRAMUSCULAR FLU VACCINE APPROVED AGES AND DOSAGES		
Vaccine	**Approved Ages**	**Dose Volume**
Afluria quadrivalent	6–35 months ≥3 years	0.25 mL 0.5 mL
Fluarix quadrivalent	≥6 months	0.5 mL
Flulaval quadrivalent	≥6 months	0.5 mL
Fluzone quadrivalent	6–35 months ≥3 years	0.25 or 0.5 mL* 0.5 mL
Flucelvax quadrivalent	≥6 months	0.5 mL
Flublok quadrivalent	≥18 years	0.5 mL
Fluzone high-dose quadrivalent	≥65 years	0.7 mL
Fluad quadrivalent	≥65 years	0.5 mL
* The approved dose volume per the package insert for Fluzone Quadrivalent is *either* 0.25 mL or 0.5 mL for ages 6–35 months, but 0.25mL prefilled syringes are not available. (ACIP, 2023)		

Impact of Flu Vaccination on General Health

The best way to prevent flu and its potentially life-threatening complications is by receiving a yearly flu vaccine (CDC, 2023a). Research shows the positive impact flu vaccines have on the health of the population:

- During seasons when flu vaccines are similar to circulating flu viruses, flu vaccine has been shown to reduce the risk of a doctor visit for flu by 40%–60%.
- Flu vaccination is associated with lower rates of some cardiac events among people with heart disease, especially among those who have had a cardiac event in the past year.
- Vaccination can reduce the risk of flu-related worsening of chronic lung disease requiring hospitalization.
- Among people with diabetes and chronic lung disease, flu vaccination has been shown to be associated with reduced hospitalizations from a worsening of their chronic condition.
- In children ages 6 months to 17 years, vaccination has been found to reduce risk of severe life-threatening hospitalization by 41% and flu-related emergency department visits by half.
  (CDC, 2023c)

FLU AND COVID-19 VACCINE COADMINISTRATION

The CDC notes that the flu vaccine and COVID-19 vaccine may be given at the same healthcare visit if someone is due for both vaccines. Both vaccines may be given in the same arm at least an inch apart, or the vaccines may be given in different arms.

Results from a 2022 study show that people who received a flu vaccine and an mRNA COVID-19 booster vaccine at the same time were slightly more likely (8%–11%) to have reactions including fatigue, headache, and muscle ache than people who received only a COVID-19 mRNA booster vaccine, but these reactions were mostly mild and went away quickly.

If people choose to receive the flu and COVID-19 vaccines at different times, there is no recommended waiting time between receiving a flu vaccine and a COVID-19 vaccine.

(CDC, 2022a; CDC, 2023a; CDC, 2023j)

COVID-19

Over one million people have died from COVID-19 in the United States. Thousands of people continue to become infected with the SARS-CoV-2 virus, are hospitalized with serious illness, and die from COVID-19. However, due to vaccines, therapeutics, and past COVID infections, the risk has decreased for severe illness and death from COVID (COVID Act Now, 2023).

The SARS-CoV-2 virus that causes COVID-19 is also constantly mutating. In the majority of cases, when mutations take place, they are inconsequential because the protein configuration of the virus does not change. These are small changes (referred to as "drift"), and the immune system is able to recognize and respond to such changes. However, there may also be abrupt, significant changes in the structure of a virus (referred to as "shift"). If the configuration of a virus mutates enough, the virus may respond differently to treatments, or the antibodies of the immune system may not recognize the new mutation, resulting in infection.

Although antibodies created after COVID-19 vaccination will recognize and respond to many mutations of the virus, the immune system may not recognize and respond to all mutations, which necessitates the development of updated booster vaccines (Nightengale, 2021).

COVID vaccines will transition from government purchase to the commercial market in the fall of 2023. For optimal protection, the CDC recommends COVID-19 vaccines for everyone 6 months of age and older.

2023–2024 COVID-19 Vaccine Updates

In June 2023, FDA's Vaccines and Related Biological Products Advisory Committee (VRBPAC) made recommendations on SARS-CoV-2 strain to be included in updated COVID-19 vaccines for use in the United States beginning in the fall of 2023. The committee unanimously voted that the vaccine composition be updated to a monovalent COVID-19 vaccine with an Omicron/XBB.1.5 subvariant, and the FDA advised manufacturers to develop COVID booster shots with that composition (FDA, 2023c).

In September 2023, the FDA approved and authorized for emergency use those updated COVID-19 vaccines formulated to more closely target currently circulating variants and to provide better protection against serious consequences of COVID-19, including hospitalization and death.

- **Individuals 5 years of age and older regardless of previous vaccination** are eligible to receive a single dose of an updated mRNA COVID-19 vaccine at least 2 months since the last dose of any COVID-19 vaccine.
- **Individuals 6 months through 4 years of age who have previously been vaccinated** against COVID-19 are eligible to receive one or two doses of an updated mRNA COVID-19 vaccine. **Unvaccinated individuals 6 months through 4 years of age** are eligible to receive three doses of the updated authorized Pfizer-BioNTech COVID-19 vaccine or two doses of the updated authorized Moderna COVID-19 vaccine.

The FDA is confident in the safety and effectiveness of these updated vaccines, and the agency's benefit-risk assessment demonstrates that the benefits of these vaccines for individuals 6 months of age and older outweigh their risks.

Individuals who receive an updated mRNA COVID-19 vaccine may experience similar side effects as those reported by individuals who previously received mRNA COVID-19 vaccines as described in the respective prescribing information or fact sheets.

The updated vaccines are expected to provide good protection against COVID-19 from the currently circulating variants. Barring the emergence of a markedly more virulent variant, the FDA anticipates that the composition of COVID-19 vaccines may need to be updated annually, as is done for the seasonal influenza vaccine (FDA, 2023e).

In line with the FDA approvals described above, the Centers for Disease Control and Prevention's Advisory Committee on Immunization Practices (ACIP) updated their COVID-19 vaccine **recommendations**:

- **Everyone ages 6 years and older** should receive one updated Pfizer-BioNTech or Moderna COVID-19 vaccine to be up to date.
- **People ages 65 years and older** may get a second dose of updated Pfizer-BioNTech or Moderna COVID-19 vaccine.
- People who are moderately or severely **immunocompromised** may get additional doses of updated Pfizer-BioNTech or Moderna COVID-19 vaccine.
- **Children ages 6 months to 5 years** may need multiple doses of COVID-19 vaccine to be up to date, including at least one dose of updated Pfizer-BioNTech or Moderna COVID-19 vaccine, depending on the number of doses they've previously received and their age.

The CDC's COVID-19 vaccine recommendations will be updated as needed (see "Resources" at the end of this course).

Impact of COVID-19 Vaccination on General Health

Results of vaccine effectiveness (VE) studies are critical to the CDC's vaccine program and national vaccine policy decision-making. The CDC has published the following findings about **vaccine effectiveness in adults**:

- The original monovalent (ancestral SARS-CoV-2 strain) mRNA vaccination was 76% effective in preventing COVID-19–associated invasive mechanical ventilation and death up to 6 months after the last dose and remained 56% effective at 1–2 years.
- Among adults aged ≥18 years without immunocompromising conditions, bivalent (ancestral and BA.4/BA.5 strains) vaccine effectiveness against COVID-19–associated hospitalization declined from 62% at 7–59 days postvaccination to 24% at 120–179 days compared with VE among unvaccinated adults. Among immunocompromised adults, lower bivalent booster VE was observed. However, bivalent booster VE was sustained against critical COVID-19-associated outcomes, including intensive care unit admission or death.
- Among nursing home residents who were up to date with COVID-19 vaccination (most had received a bivalent vaccine), vaccine effectiveness against SARS-CoV-2 infection was 31.2%.
- Both the original (monovalent) mRNA COVID-19 vaccine series and the bivalent vaccine provide protection against COVID-19–associated emergency department and urgent care visits in children ages 6 months to 4 years (Pfizer-BioNTech) and 6 months to 5 years (Moderna).
  (CDC, 2023k)

A group of National Institutes of Health (NIH)–supported researchers found a significantly low incidence of severe COVID-19 illness among more than 1.6 million **veterans** who had been vaccinated and boosted. Over a 24-week follow-up for each fully vaccinated participant, the following results were reported:

- Individuals with an immune-compromising condition had a very low rate of hospitalization or death. In this group, 39.6 per 10,000 people had a serious breakthrough infection.
- For those participants who had preexisting health conditions, hospitalizations or deaths totaled 0.07%.
- In adults 65 years of age or younger who had no high-risk conditions, hospitalizations or death totaled less than 0.01%.
- Participants who had received boosters as well as the primary vaccinations and who were among the high-risk groups with comorbidities seemed to be protected against even some emergent variants.
  (Kelly et al., 2022)

The World Health Organization (WHO) has stated that COVID-19 vaccines have saved millions of lives and provide strong protection against serious illness, hospitalization, and death. To

ensure that protection is maximized, the WHO encourages people to receive COVID-19 vaccine doses and boosters as recommended by medical authorities (WHO, 2023).

FINDING COVID AND FLU VACCINES

To find nearby COVID-19 and flu vaccine locations, individuals can:

- Search online at https://vaccines.gov
- Text a zip code to 438829
- Call 800-232-0233
- Ask a **doctor**, pharmacist, or community health center or visit their website
- Contact the state or local health department

PNEUMONIA

Pneumonia is a common respiratory infection that causes more than one million hospitalizations and more than 50,000 deaths annually (ALA, 2022). Anyone can get pneumonia, but two age groups are at higher risk of developing pneumonia and having a more serious form of the disease:

- **Babies and children** (2 years of age or younger) are at higher risk because their immune systems are not yet mature. This risk is especially high for premature babies.
- **Older adults** (65 years of age or older) are also at higher risk because immune systems typically weaken with age. Older adults are also more likely to have other chronic health issues that increase the risk of pneumonia.

Babies, children, and older adults who do not receive the recommended vaccines to prevent pneumonia have an even higher risk (NHLBI, 2022).

2023–2024 Pneumonia Vaccine Updates

There are currently two types of pneumococcal vaccine available in the United States: pneumococcal polysaccharide vaccine (PPSV23) and pneumococcal conjugate vaccine (PCV13, PCV15, and PCV20) (Papke & Cochran, 2023).

The CDC recommends routine administration of PCV13 or PCV15 for all children **younger than 2 years** of age as follows: Give PCV13 or PCV15 to infants as a series of 4 doses, one dose at each of these ages: 2 months, 4 months, 6 months, and 12 through 15 months.

Children **ages 2 through 4 years** who miss their shots or start the series later should still be vaccinated. The number of doses recommended and the intervals between doses will depend on the child's age when vaccination begins (CDC, 2023d; CDC, 2023h; CDC, 2023i).

Children **ages 2 through 5 years** with certain medical conditions (such as chronic heart disease, cerebrospinal fluid leak, chronic lung disease, diabetes mellitus, HIV infection, chronic renal failure, or cochlear implant) that increase their risk of pneumococcal disease should be vaccinated with either PCV13 or PCV15 (CDC, 2023i).

Children **ages 6 through 18 years** with medical conditions such as cochlear implant, cerebrospinal fluid leak, or diseases associated with treatment of immunosuppressive drugs or radiation therapy should be vaccinated with PCV13 or PCV15 (CDC, 2023i).

Adults **ages 19 through 64 years** of age with conditions such as alcoholic chronic liver disease, lung or cardiac disease, or immunodeficiency or who smoke cigarettes should be vaccinated with either PCV13 or PCV15 (CDC, 2023i).

The CDC recommends routine administration of pneumococcal conjugate vaccine (PCV15 or PCV20) for all adults **ages 65 years or older** who have never received any pneumococcal conjugate vaccine or whose previous vaccination history is unknown. If PCV15 is used, this should be followed by a dose of PPSV23 one year later. The minimum interval is 8 weeks and can be considered in adults with an immunocompromising condition, cochlear implant, or cerebrospinal fluid leak. If PCV20 is used, a dose of PPSV23 is NOT indicated (CDC, 2023d; CDC, 2023h; CDC, 2023i).

Impact of Pneumonia Vaccination on General Health

The pneumococcal vaccine protects people who are most at risk for serious pneumococcal infections that can lead to serious complications, hospitalization, or even death. It is important to be aware that the vaccine helps protects against the most common types of bacterial pneumonia, but not all of them. There are many different types of bacterial pneumonia, but the vaccine will significantly reduce the risk of the common forms of the disease (Cleveland Clinic, 2021).

Receiving a flu shot also helps to prevent pneumonia, since influenza is a fairly common trigger of pneumonia. Thus, preventing the flu is a good way to reduce the risk of developing pneumonia.

The CDC has published the following research findings regarding the effectiveness of the pneumococcal vaccines:

- Compared to unvaccinated children, children who received PCV7 had 20% fewer episodes of chest X-ray confirmed pneumonia, 7% fewer episodes of acute otitis media, and 20% fewer tympanostomy tube placements.
- More than 80% of healthy adults who received the PPSV23 vaccine developed antibodies against the serotypes contained in the vaccine. Older adults and persons with some chronic illnesses or immunodeficiency may not respond as well.

- Efficacy studies have resulted in various estimates of clinical effectiveness. Overall, the PPSV23 vaccine is 60%–70% effective in preventing invasive disease caused by serotypes in the vaccine.
  (CDC, 2022c)

RESPIRATORY SYNCYTIAL VIRUS INFECTION (RSV)

RSV is one of the most common respiratory viruses in circulation. Older adults and infants are at greater risk for its development and for experiencing serious disease. Fortunately, both of these groups can now be protected from the disease via vaccination.

RSV causes annual outbreaks of respiratory illnesses in all age groups. In most regions of the United States, RSV season begins in the fall and peaks in the winter. The timing and severity of the RSV season can vary from year to year (CDC, 2023e).

Older adults, especially those with underlying health conditions (e.g., cardiac or respiratory disease), are at high risk for severe disease caused by RSV. RSV leads to about 60,000–120,000 hospitalizations and 6,000–10,000 deaths among adults 65 years of age and older on an annual basis (FDA, 2023a).

2023–2024 RSV Vaccine Updates

Several new RSV vaccines were approved by the U.S. Food and Drug Administration (FDA) in 2023:

- In May, the FDA approved Arexvy, the first RSV vaccine approved for use in the United States. Arexvy is approved for the prevention of lower respiratory tract disease (LRTD) caused by RSV in individuals ages 60 years and older (FDA, 2023a).
- In July, the FDA approved nirsevimab (Beyfortus) for the prevention of RSV in neonates and infants born during or entering their first RSV season and in children up to 24 months of age who remain vulnerable to severe RSV disease through their second RSV season.
- In August, the FDA approved Abrysvo, the first vaccine for use in pregnant individuals to prevent LRTD and severe LRTD caused by RSV in infants from birth through age 6 months (FDA, 2023d).

AREXVY FOR ADULTS AGES 60 AND OLDER

The safety and effectiveness of the new respiratory syncytial virus (RSV) vaccine Arexvy is based on the FDA's analysis of data from an ongoing, randomized, placebo-controlled clinical study conducted in the United States and internationally in 12,500 individuals ages 60 years and older. The main clinical study of Arexvy was designed to assess the safety and effectiveness of a single dose. Participants will remain in the study through three RSV seasons to assess the duration of effectiveness and the safety and effectiveness of repeat vaccination. Data for a single

dose of Arexvy from the first RSV season of the study were available for the FDA's analysis (FDA, 2023a).

Arexvy is not a live vaccine. It is a recombinant subunit vaccine that does not contain any living virus. Arexvy is generally well tolerated. **Side effects** are typically temporary and of brief duration. The most commonly reported side effects include:

- Injection site pain
- Fatigue
- Muscle aches
- Headache
- Joint pain
  (Mayo Clinic, 2023)

Just one injection of Arexvy into the deltoid muscle is needed to provide protection against infection. It is safe to receive the **RSV vaccine and the flu vaccine** at the same time. It is not known if Arexvy will need to be administered annually. RSV does not mutate in the same ways as influenza and SARS-CoV-2, so it is believed, at this time, that there is not a need to be vaccinated annually. However, more research is needed. Clinical trial results showed that the vaccine provides protection for two RSV seasons, so it may ultimately need to be given every two years (CDC, 2023m).

The CDC recommends that adults 60 and older may receive the vaccine, using shared clinical decision-making. The decision to vaccinate an individual patient should be based on a discussion between the healthcare provider and the patient (CDC, 2023e).

NIRSEVIMAB (BEYFORTUS) FOR NEONATES AND CHILDREN UNDER AGE 2

In July 2023, the FDA approved nirsevimab, a long-acting monoclonal antibody, for passive immunization to prevent RSV-associated lower respiratory tract infection among infants and young children. In August, ACIP recommended nirsevimab for all infants ages <8 months who are born during or entering their first RSV season and for infants and children ages 8–19 months who are at increased risk for severe RSV disease and are entering their second RSV season.

On the basis of pre–COVID-19 pandemic patterns, nirsevimab could be administered in most of the continental United States from October through the end of March. Nirsevimab can prevent severe RSV disease among infants and young children at increased risk for severe RSV disease (FDA, 2023b; CDC, 2023l).

The most common **side effects** include rash and pain, swelling, or hardness at the injection site. Other possible side effects include:

- Swelling of the face, mouth, or tongue

- Respiratory distress
- Difficulty swallowing
- Unresponsiveness
- Cyanosis of the skin, lips, or underneath the fingernails
- Muscle weakness
- Severe rash, hives, or itching
(McGovern, 2023)

Nirsevimab comes with warnings and precautions about serious hypersensitivity reactions, including anaphylaxis, that have been observed with other human IgG1 monoclonal antibodies. The vaccine should be given with caution to infants and children with clinically significant bleeding disorders (FDA, 2023b).

ABRYSVO FOR PREGNANT INDIVIDUALS

The new RSV vaccine Abrysvo is the first vaccine approved for use in pregnant individuals to prevent lower respiratory tract disease (LRTD) caused by RSV in infants. According to the CDC, RSV is the leading cause of infant hospitalization in the United States. Abrysvo is approved for use at 32–36 weeks gestational age of pregnancy. It is a single-dose injection.

In studies, the most commonly reported **side effects** were pain at the injection site, headache, muscle pain, and nausea. Uncommonly, pre-eclampsia occurred in 1.8% of pregnant individuals who received Abrysvo compared to 1.4% of pregnant individuals who received a placebo. In safety studies, low birth weight and jaundice in infants occurred at a higher rate in pregnant Abrysvo recipients compared to pregnant placebo recipients(FDA, 2023d).

Impact of RSV Vaccination on General Health

RSV vaccination offers protection from RSV. This is especially important for older adults and infants who may get quite sick from the infection, need hospitalization, or even die (CDC, 2023f). Clinical studies of the new RSV vaccinations found:

- In infants born to pregnant individuals who received Abrysvo as compared to pregnant individuals who received placebo, Abrysvo reduced the risk of severe lower respiratory tract disease by 81.8% within 90 days after birth and 69.4% within 180 days after birth (FDA, 2023d).
- Of the 1,453 preterm infants who were born during or entering their first RSV season, 969 received a single dose of nirsevimab, and 484 received a placebo. Among infants who received the drug, 2.6% experienced RSV LRTI compared to 9.5% of infants who received a placebo. The drug reduced disease risk by about 75% relative to the placebo (FDA, 2023b).

- In a study of approximately 25,000 individuals 60 years of age and older in the United States and internationally, those who received Arexvy showed a reduced risk of developing RSV-associated LRTD by 82.6% and reduced risk of developing severe RSV-associated LRTD by 94.1% (FDA, 2023a).

CONCLUSION

The 2023–2024 respiratory virus season has begun. Updated vaccines offer enhanced protection against respiratory infections and illnesses. Of particular note, RSV vaccine is a newly developed agent that offers protection to older adults and infants and is approved for use in pregnant individuals to prevent lower respiratory tract disease in infants through 6 months of age. Healthcare professionals are obligated to be knowledgeable about current guidelines and updates in order to provide the best possible patient care.

RESOURCES

Do I need a pneumonia vaccine? (WebMD)
https://www.webmd.com/lung/pneumococcal-vaccine-schedule

Information for the 2023–24 Flu Season (CDC)
https://www.cdc.gov/flu/season/faq-flu-season-2023-2024.htm

Is there a vaccine for RSV? (Cleveland Clinic)
https://health.clevelandclinic.org/who-should-get-rsv-vaccine/

Stay up to date with new COVID-19 vaccines (CDC)
https://www.cdc.gov/coronavirus/2019-ncov/vaccines/stay-up-to-date.html

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TEST

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1. Which statement describes a change in 2023–2024 influenza vaccine recommendations from previous season recommendations?

a. People with a history of cardiac events should no longer receive the flu vaccine.
b. The composition of flu vaccines will now be updated twice a year.
c. Additional safety measures are no longer recommended for flu vaccination in people with an egg allergy.
d. It is now recommended that flu vaccine and COVID-19 vaccine not be given at the same time.

2. Which subvariant of the COVID-19 virus is recommended for inclusion in fall 2023 booster vaccines?

a. Delta
b. XBB.1.5
c. Gamma
d. BA.1

3. Which CDC recommendation accurately describes guidelines for pneumococcal vaccination?

a. An adolescent who is 15 years of age should never receive the pneumococcal vaccine.
b. Routine administration of pneumococcal conjugate vaccine is recommended for all adults 50 years of age and older.
c. A 3-year-old with cerebrospinal fluid leak should be vaccinated with PCV13 or PCV15.
d. Children between the ages of 2 through 5 years are prohibited from receiving the pneumococcal vaccine.

4. Which statement is **accurate** about the respiratory syncytial virus (RSV) vaccine Arexvy?

a. The CDC recommends that Arexvy and a flu vaccination not be given at the same time.
b. Arexvy is a live vaccine that contains living virus.
c. RSV mutates in ways similar to COVID, so an annual vaccination is necessary.
d. Trials showed that Arexvy provides protection for two RSV seasons.