Long-Term Care Updates

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What's new in vaccines?

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Introduction

Vaccinations are an effective tool to protect against certain diseases and complications. Vaccines continue to reduce cases and deaths from preventable diseases in the United States.[1] The World Health Organization (WHO) estimates that vaccination prevents 3.5 -5 million deaths each year and helps individuals live healthier lives.[2] Through innovation, we have several types of vaccines (i.e., live-attenuated, nucleic acid based, viral vectored, virus-like particles, and recombinant protein) working through different mechanisms to engage the body's immune response.[1]

Respiratory Syncytial Virus

Respiratory Syncytial Virus (RSV) is a contagious respiratory virus that spreads via respiratory droplets or contaminated hard surfaces. It commonly causes mild cold-like symptoms including runny nose, coughing, sneezing, and fever. In older adults, especially those with underlying heart or lung disease, or weakened immune systems, RSV can develop into a serious infection such as bronchiolitis or pneumonia, requiring hospitalization.[3] Among adults 65 years of age and older, RSV leads to approximately 60,000-120,000 hospitalizations and 6,000-10,000 deaths each year.[4]

Currently, there are two vaccine products available. One adjuvanted recombinant RSV vaccine (RSVPreF3 Oa; Arexvy) and one non-adjuvanted recombinant RSV vaccine (RSVPreF; Abrysvo).[5] Table 1 provides additional information. Both vaccine products have demonstrated moderate to high efficacy in adults aged 60 years and over in the prevention of symptomatic RSV-associated lower respiratory tract disease (LRTD).[6]

Clinical data review:

Papi and colleagues with GlaxoSmithKline are evaluating the efficacy of a single dose (Arexvy) and annual revaccination in adults aged 60 years and older via an ongoing Phase 3, randomized, placebo-controlled study. Approximately 25,000 participants were enrolled from 17 countries.[7,8] Participants will be followed for three consecutive RSV seasons in the Northern Hemisphere and two consecutive seasons in the Southern Hemisphere. The primary outcome is RSV-related LRTD confirmed by reverse-transcriptase polymerase chain reaction (RT-PCR). Surveillance for acute infection is completed through participants reporting as needed and through scheduled follow-ups. Participants are required to report if they had at least two symptoms or signs of acute respiratory infection lasting at least 24 hours, starting 30 days after injection. Results from season 1 in the Northern Hemisphere were posted on June 22, 2023, and showed total vaccine efficacy (VE) against LRTD at 82.6% (96.95% CI, 57.9-94.1) and 56.1% (95% CI, 28.2% - 74.4%) during the second season.[8] VE against severe RSV-related LRTD was 94.1% (95% CI, 62.4 – 99.9). Among participants with pre-existing comorbidities, VE was 94.6% (95% CI, 65.9-99.9). In adults aged 70-79 years of age, VE was 93.8% (95% CI, 60.2-99.9). Tolerability of the vaccine was favorable, and the adverse events reported most frequently included injection site pain, fatigue, myalgia, and headache.[9] Among participants from the exposed population, approximately 23,000, that completed 6 months of follow-up, 4.2% of the vaccine recipients and 4.0% of placebo recipients reported a serious adverse event. Fatalities were reported for both the vaccine and placebo groups; 49 (0.4%) and 58 (0.5%) respectively. A blinded assessment was completed, and alternative explanations were considered plausible based on time and presence of risk factors.[8] The trial is anticipated to end May 31, 2024.[7]

Walsh and colleagues with Pfizer are evaluating the efficacy, safety, and immunogenicity of a single dose (Abrysvo) vaccine to prevent LRTI-RSV in adults 60 years of age and older via an ongoing phase 3, randomized, double-blinded, placebo-controlled trial. Approximately 37,000 participants were enrolled from 7 countries.[10] There are two primary endpoints; VE against seasonal RSV-associated lower respiratory tract illness with at least two or three signs or symptoms and VE against RSV-associated acute respiratory illness. Analysis after the first season (August 31, 2021 through July 14, 2022) showed VE against a first episode of RSV-lower respiratory tract illness with at least two signs or symptoms as 66.7% (96.66% CI, 28.8 - 85.8). VE for RSV- associated lower respiratory tract illness with at least three signs or symptoms was 85.7% (96.66% CI, 32.0 – 98.7). In subgroup analyses by age group, VE was similar for 60 to 69 years of age, 70 to 79 years of age, or ≥ 80 years of age; leading to maintained vaccine efficacy throughout the first season. When evaluating safety, a subgroup of 7196 participants was included. Local reactions were reported more frequently by the vaccine recipients versus placebo recipients (12% vs. 7%) and the incidence of systemic events was similar between the two groups (27% and 26% respectively). The most common adverse events reported include injection-site pain, fatigue, and headache. Serious or life-threatening adverse events were reported in both vaccine and placebo participants (0.5% and 0.4% respectively). Three serious events were related to trial intervention by investigators and included a delayed allergic reaction, a combination of diplopia, paresthesia of palms and soles, and oculomotor and abducens nerve paralysis 8 days after injection, and a myocardial infarction 6 days after injection. No trial intervention-related deaths were reported.[11] The trial is anticipated to end February 26, 2025.[10]

Table 1. Comparison of Arexvy and Abrysvo[12,13]

	Arexvy	Abrysvo
Product	Respiratory Syncytial Virus Vaccine, Adjuvanted Suspension for IM injection	Respiratory Syncytial Virus Vaccine, Non-adjuvanted Solution for IM injection
Manufacturer	GlaxoSmithKline	Pfizer Inc.
Pharmacologic category	Inactivated (Viral); Vaccine, Recombinant	
Indication	Prevention of LRTD caused by RSV in people 60 years of age and older.	
Dosage	Adults ≥ 60 years of age: 0.5 mL IM as single dose	
Preparation for administration	Prior to use, powder (lyophilized antigen vial) must be reconstituted with the liquid (adjuvant vial).	Reconstitute with provided syringe of sterile water diluent component
Storage requirements after reconstitution	Administer immediately or store in the refrigerator between 2^0 C (35.6^0 F) and 8^0 C (46.4^0 F) or at room temperature [up to 25^0 (77^0 F)] for up to 4 hours. Protect vials from light. Do not freeze.	Administer immediately or store at room temperature [15^0 C to 30 ^{0} C (59^0F to 86^0F) and use within 4 hours. Do not store in refrigerated conditions. Do not freeze.
Adverse reactions	Most commonly reported (≥ 10%) were injection site pain, fatigue, myalgia, headache, arthralgia	Most commonly reported (≥ 10%) were fatigue, headache, pain at injection site, muscle pain
Availability	FDA approved May 2023; anticipated availability Fall 2023	FDA approved May 2023; anticipated availability third quarter of 2023

Recommendations:

According to the Advisory Committee on Immunization Practices (ACIP) and The American Academy of Family Physicians (AAFP) for the 2023-2024 season, a single dose of RSV vaccine is recommended for adults aged 60 years and over using shared clinical decision-making.[6,14,15] Shared clinical guidance involves a discussion between a patient and his/her provider and is guided by patient's risk for disease, benefit versus risk, patient preferences, and provider's discretion.[16] Box 1 provides additional information on risk factors for severe disease. For optimal effect, vaccination should occur prior to the RSV season. Due to the pandemic, RSV seasonal patterns have yet to be re-established, therefore, vaccination for the 2023-2024 season should be offered once the vaccine becomes available.[6]

Box 1: Risk factors for severe RSV disease[6,16]

Risk Factor
• Chronic lung disease (i.e., COPD, asthma) • Cardiovascular Diseases (congestive heart failure, coronary artery disease) • Moderate or severe immune compromise • Diabetes mellitus • Neurologic or neuromuscular conditions • Kidney disorders • Liver disorders • Hematologic disorders • Frail individuals • Individuals of advanced age • Residents of nursing homes and ≥ 60 years of age

COVID-19

COVID-19 is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and spreads via respiratory droplets ranging from larger droplets to smaller aerosols. COVID-19 has a variety of signs and symptoms ranging from mild cold and flu-like symptoms to more serious complications such as shortness of breath, pneumonia, heart problems, acute kidney injury, or organ failure. Individuals at risk for serious complications or hospitalizations include older people and those with underlying medical conditions (i.e., diabetes, cardiovascular disease, respiratory disease, cancer).[17]

Vaccinations have been integral in reducing severity of symptoms and saving lives. According to Watson et al, an estimated 14.4 million deaths from COVID-19 were prevented in 185 countries and territories from December 8, 2020, to December 8, 2021.[18] The current vaccines authorized and available by the FDA are bivalent mRNA vaccines (Moderna, Pfizer-BioNTech) and protein subunit vaccine (Novavax, Adjuvanted).[19] In June 2023, the FDA's Vaccines and Related Biological Products Advisory Committee (VRBPAC) advised that a monovalent vaccine, targeting the subvariant of Omicron, XBB.1.5 should be developed for the fall due to the fact that XBB sublineages accounted for more than 95% of the circulating variants.[20] However, monovalent vaccines targeting the subvariant, XBB 1.5, have not been addressed in current guidelines.

Recommendations:

The CDC recommendations, as of July 2023, state that everyone age 6 years and older should get 1 updated bivalent Pfizer-BioNTech or Moderna COVID-19 vaccine regardless of original vaccination status. Individuals aged 65 years and older may get 1 additional dose of COVID-19 of updated Pfizer-BioNTech or Moderna COVID-19 vaccine 4 or more months after and individuals who are moderately or severely immunocompromised may get 1 additional dose 2 or more months after the last updated COVID-19 vaccine. Those that received 1 dose of Janssen/Johnson and Johnson Vaccine are recommended to receive 1 bivalent mRNA dose at least 2 months after the previous dose, due to the discontinuation of the Janssen vaccine in the United States.[21] Table 2 provides detailed recommendations for bivalent vaccination in adults.

Table 2: Recommendations for COVID-19 bi-valent vaccinations in adults.[22-24]

	Pfizer	**Moderna**
Individuals 12 to 64 years of age Not previously vaccinated	Single Dose, 0.3 mL, IM	Single dose, 0.5 mL, IM
Individuals ≥ 65 years, Not previously vaccinated	Single Dose, 0.3 mL *One additional dose, 0.3 mL, may be administered ≥4 months after first dose of authorized bivalent vaccine.	Single dose, 0.5 mL *One additional dose, 0.5 mL may be administered ≥4 months after first dose of authorized bivalent vaccine.
Individuals 12-64 years, previously vaccinated with 1 or more doses of any monovalent COVID-19 vaccine	Single dose, 0.3 mL, ≥2 months after monovalent vaccine	Single dose, 0.5 mL, ≥ 2 months after monovalent COVID-19 vaccine.
Individuals ≥ 65 years, previously vaccinated with 1 or more doses of monovalent COVID-19 vaccine	Single dose, 0.3 mL ≥2 months after monovalent vaccine. *One additional dose, 0.3 mL, may be administered ≥ 4 months after first dose of authorized bivalent vaccine.	Single dose, 0.5 mL ≥ 2 months after monovalent COVID-19 vaccine. *One additional dose, 0.5 mL, may be administered ≥ 4 months after first dose of authorized bivalent vaccine.
Immunocompromised	≥ 5 years of age with certain kinds of immunocompromises, single additional age-appropriate dose may be administered at least 2 months following initial dose. Additional age-appropriate doses may be administered at the discretion of the healthcare provider.	≥ 6 years of age with certain kinds of immunocompromises, single additional age-appropriate dose may be administered at least 2 months following the initial dose. Additional age-appropriate doses may be administered at the discretion of the healthcare provider.

Influenza

Influenza (flu) is a contagious virus that causes acute respiratory infection of the nose, throat, and lungs. Most individuals experience mild symptoms and will recover quickly without medical intervention. However, influenza can cause severe illness requiring hospitalization or death, especially among the very young, the elderly, and those with serious health conditions.[25]

Recommendations:

In June 2023, The CDC adopted ACIP's 2023-2024 recommendations on annual influenza vaccination for everyone 6 months and older in the United States. The recommended timing of flu vaccination has not changed, with September or October being the ideal time for adults, especially those 65 years of age and older. However, the composition of the U.S. flu vaccine has been updated to match the indicated flu viruses that research suggests will be prominent.[26] Additional flu vaccine information will be provided when the annual recommendations become available in the Morbidity and Mortality Weekly Report (MMWR). Table 3 provides the updated flu vaccine component.

Table 3: Influenza Vaccine Updated Components[26]

Influenza A(H1N1) pdm09	A/Victoria/4897/2022(H1N1) pdm09-like virus for egg-based vaccines
	A/Wisconsin/67/2022(H1N1) pdm09-like virus for cell-based or recombinant vaccines.

Conclusion

Due to evolving diseases and medical advancements, vaccine schedules and recommendations are updated frequently to reflect the most recent and current information. This allows for effective and safe care to reach communities and individuals for protection and prevention from severe disease, hospitalization, or death.[27] It is recommended to routinely check ACIP for updated guidelines because changes can occur throughout the year. As healthcare providers, we are a valuable resource to patients regarding vaccine information and administration; leaving a lasting impact on the communities we serve.

References

1) Iwasaki A, Omer SB. Why and How Vaccines Work. Cell. 2020 Oct 15;183(2):290-295. doi: 10.1016/j.cell.2020.09.040. PMID: 33064982; PMCID: PMC7560117.
2) W□orld Health Organization. Vaccines and Immunization. https://www.int/health-topics/vaccines-and-immunization#tab=tab_1. 2023. Accessed July 17, 2023.
3) Centers for Disease Control and Prevention. Respiratory Syncytial Virus Infection (RSV). https://www.cdc.gov/rsv/index.html. Last reviewed October 28, 2022. Accessed July 17, 2023
4) U.S. Food and Drug Administration. FDA Approves First Respiratory Syncytial Virus (RSV) Vaccine. https://www.fda.gov/news-events/press-announcements/fda-approves-first-respiratory-syncytial-virus-rsv-vaccine. Released May 03, 2023. Accessed July 17, 2023.
5) Givens J. (2023) What's new in geriatrics. UpToDate. https://www.uptodateodate.com/contents/whats-new-in-geriatrics?search=rsv%20vaccine&source=search_result&selectedTitle=2~15&usage_type=default&display_rank=1#H141412. Retrieved July 21, 2023.
6) Melgar M, Britton A, Roper L, et al. Use of Respiratory Syncytial Virus Vaccines in Older Adults: Recommendations of the Advisory Committee on Immunization Practices-United States, 2023. Morbidity and Mortality Weekly Report. July 21,2023;72:29.
7) Efficacy Study of GSK's Investigational Respiratory Syncytial Virus (RSV) Vaccine in Adults Aged 60 Years and Above. ClinicalTrials.gov Identifier: NCT04886596. Updated June 30, 2022. Accessed July 21, 2023
8) Papi A, Ison MG, Langley JM, et al. Respiratory Syncytial Virus Prefusion F Protein Vaccine in Older Adults. The New England Journal of Medicine. 2023; 388:595-608
9) GSK. October 13, 2022. GSK's older adult respiratory syncytial virus (RSV) vaccine candidate shows 94.1% reduction in severe RSV disease and overall vaccine efficacy of 82.6% in pivotal trial [Press release]. https://www.gsk.com/en-gb/media/press-releases/gsk-s-older-adult-respiratory-syncytial-virus-rsv-vaccine-candidate/
10) Study to Evaluate the Efficacy, Immunogenicity, and Safety of RSVpreF in Adults (RENOIR). ClinicalTrials.gov Identifier: NCT05035212. Updated July 19,2023. Accessed July 21, 2023.
11) Walsh EE, Marc GP, Zareba AM, et al. Efficacy and Safety of a Bivalent RSV Prefusion F Vaccine in Older Adults. The New England Journal of Medicine. 2023; 388:1465-1477
12) Abrysvo [package insert]. New York, New York: Division of Pfizer Inc. July 2023
13) Arexvy [package insert]. Durham, North Carolina. GlaxoSmithKline. 2023
14) Center for Disease Control and Prevention. CDC Recommends RSV Vaccine For Older Adults. https://cdc.gov/media/releases/2023/s0629-rsv.html. Published June 29, 2023. Accessed July 22, 2023.
15) The American Academy of Family Physicians. Respiratory Syncytial Virus (RSV) Vaccine. https://www.aafp.org/family-physician/patient-care/prevention-wellness/immunizations-vaccines/disease-pop-immunization/rsv-vaccine.html. 2023. Accessed July 22, 2023.
16) Shared decision making. National Institute for Health and Care Excellence (NICE); 2021 Jun 17. (NICE Guideline, No. 197.) Available from: https://www.ncbi.nlm.nih.gov/books/NBK572428/. Accessed July 22, 2023.
17) Center for Disease Control and Prevention. COVID-19. https://www.cdc.gov/coronavirus/2019-ncov/your-health/about-covid-19.html. Updated July 10, 2023. Accessed July 14, 2023.
18) Watson OJ, Barnsley, G, Toor J, et al. Global impact of the first year of COVID-19 vaccination: a mathematical modelling study. *The Lancet Infectious Disease*. 2022;22(9):1293-1302.
19) Center for Disease Control and Prevention. Use of COVID-19 Vaccines in the U.S. https://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html#table-01. Updated May 12, 2023. Accessed July 14,2023.
20) U.S. Food and Drug Administration. Recommendation for the 2023-2024 Formula of COVID-19 Vaccines in the U.S. https://www.fda.gov/vaccines-blood-biologics/updated-covid-19-vaccines-use-united-states-beginning-fall-2023. Published June 16,2023. Accessed July 14, 2023.
21) Centers for Disease Control and Prevention. Stay Up To Date with Vaccines. https://www.cdc.gov/coronavirus/2019-ncov/vaccines/stay-up-to-date.html. Updated July 17, 2023. Accessed July 19, 2023.
22) Moderna COVID-19 Vaccine, Bivalent [Fact Sheet] Princeton, NJ. Moderna US Inc. April 2023
23) Pfizer COVID-19 Vaccine, Bivalent [Fact Sheet] New York, New York. Pfizer Inc. July 14, 2023
24) SARS-CoV-2 Virus (COVD-19) mRNA Vaccine. Clinical Pharmacology powered by ClinicalKey. Philadelphia (PA): Elsevier. 2023. https://www.clinicalkey.com/pharmacology/monograph/5295?sec=monindi&n=Moderna%20COVID-19%20Bivalent.
25) Centers for Disease Control and Prevention. About Flu. https://www.cdc.gov/flu/about/index.html. Reviewed June 30, 2023. Accessed July 13, 2023.
26) Center for Disease Control and Prevention. 2023-2024 CDC Flu Vaccination Recommendations Adopted. 2023-2024 CDC Flu Vaccination Recommendations Adopted | CDC. Last Reviewed June 29, 2023. Accessed July 13, 2023.
27) Immunize.org. Adult Immunization: Importance of Staying Up to Date with Vaccines. http://www.immunize.org/catg.d/p4033.pdf. June 6, 2023. Accessed July 13, 2023.