AHP & MHA Clinical Spotlight: Respiratory Syncytial Virus

Overview of Respiratory Syncytial Virus (RSV)

RSV is a single-stranded ribonucleic acid virus of the *Pneumoviridae* family. RSV exposure results in respiratory tract infections in patients of all ages, with illness ranging from mild to severe. Almost all children will have experienced RSV-related illness by age 2 and are commonly reinfected, as are adults.[1] Repeat infections are usually milder than an initial RSV infection.[1]

This virus can survive for several hours on hands or fomites.[1] Direct contact is most often how RSV is transmitted; however, large droplet aerosols can also transmit the virus. Preventative measures against a RSV infection include hand washing, cough hygiene, avoidance of tobacco smoke exposure, and with the 2023 approval of Arexvy® and Abrysvo™ also vaccination.[2]

Certain groups of adults are at risk for severe RSV infection, exacerbation of pre-existing medical conditions (eg, asthma, chronic obstructive pulmonary disease, congestive heart failure), and hospitalization. At-risk groups include those patients with chronic medical conditions such as lung diseases (eg, COPD and asthma), heart conditions (eg, heart failure and coronary artery disease), moderate or severe immune compromise (due to medical conditions or immunosuppressive treatments), hematopoietic cell or solid organ transplant, diabetes, neurologic/neuromuscular conditions, kidney/liver/hematologic disorders, frailty, and those of advanced age.[3]

There is a seasonality to RSV infections. Prior to the COVID-19 pandemic, RSV epidemics would start in October, peak in December, and level off from March through April. However, this pattern has since changed with earlier onsets and longer durations.[4]

Of the more than 3 million symptomatic RSV cases each year, nearly 1.1 million require medical attention in adults ≥ 60 years.[4] In the 65 and older population, RSV is responsible for approximately 177,000 hospitalizations and 14,000 deaths annually.[4] Mortality rates in this population are similar to those of influenza (as high as 8% in hospitalized patients).

Even following hospital discharge, RSV can negatively affect quality of life. A patient's independence can be compromised as fatigue and weakness may persist even after acute illness has resolved. Furthermore, quality of life can be negatively affected if the RSV infection results in the aggravation of a patient's pre-existing medical conditions.

Patients with RSV can be asymptomatic (and shed the virus for an average of 11 days) with an incubation period of approximately four to six days.[1] Symptomatic older children and adults will experience upper respiratory tract symptoms. Older adults may develop lower respiratory tract disease (eg, pneumonia, bronchitis) and airway reactivity, especially if there is pre-existing asthma or chronic obstructive pulmonary disease.[1] Complications from RSV infection include pneumonia (which can lead to respiratory failure) and exacerbation of pre-existing pulmonary or cardiovascular conditions. Extrapulmonary sequelae from RSV are uncommon but include syndrome of inappropriate secretion of antidiuretic hormone, cardiac complications (eg, myocarditis, heart failure, arrhythmias), shock, and neurologic complications (eg, seizures, encephalopathy).[1]

Several other respiratory pathogens mimic the clinical presentation of RSV. In order to confirm a diagnosis of RSV infection, respiratory secretions can be tested. Microbiologic testing will aid in the differential diagnosis of other pathogens that cause lower respiratory tract disease (LRTD) and bronchial reactivity.[1]

RSV Vaccines (Arexvy® - GSK and Abrysvo™- Pfizer): Place in Therapy

Arexvy® is a vaccine supplied as a single-dose vial of lyophilized antigen.[4] Arexvy provides active immunization against RSV prefusion F3 glycoprotein to protect against RSV-A and/or B-associated LRTD.[5] It was FDA-approved in May 2023 for the prevention of LRTD due to RSV in patients ≥ 60 years of age.[4]

Abrysvo™ was FDA-approved for the same indication also in May 2023. However, Abrysvo also provides passive immunization as antibodies to RSV antigens are transferred across the vaccinated mother's placenta to protect infants less than 6 months of age against LRTD due to RSV infection.

Both vaccines are based on prefusion RSV F glycoproteins. However, Arexvy includes an adjuvant (AS01E) whereas Abrysvo is non-adjuvanted. Researchers conducting randomized trials found that efficacy of each in preventing RSV-related lower respiratory disease is 83% and 67%, respectively.[5,6]

In June 2023, the Respiratory Syncytial Virus Vaccines Adults Work Group of the Advisory Committee on Immunization Practices (ACIP) endorsed a recommendation that individuals ≥ 60 years old are eligible to receive a single dose of an RSV vaccine.[3] With both RSV vaccines demonstrating efficacy in reducing symptomatic RSV-related LRTD for two consecutive RSV seasons in patients ≥ 60 years of age, the ACIP work group determined that vaccination has the potential to reduce the health burden associated with RSV disease in this population. However, clinical trials did not determine if immunization with either of the RSV vaccines was able to prevent RSV-related hospitalization and mortality. While the safety profiles of both vaccines were deemed acceptable, the occurrence of six inflammatory neurologic events led the ACIP work group to advise that until additional data on the risk of such events becomes available, RSV immunization should be limited to older adults at highest risk of severe RSV disease. To that end, shared decision-making between the clinician and patient should guide the decision to vaccinate the patient for RSV. Aspects of discussion may include the patient's individual risk for RSV as well as their values and preferences.[3]

RSV: Guidelines and Resources

The following resources provide information pertaining to RSV and/or RSV immunization.

For clinicians:

RSV Vaccine Recommendations from the ACIP
https://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/rsv.html

National Institute of Allergy and Infectious Diseases
https://www.niaid.nih.gov/diseases-conditions/respiratory-syncytial-virus-rsv

National Library of Medicine MedlinePlus: RSV
https://medlineplus.gov/respiratorysyncytialvirusinfections.html

American Lung Association RSV Resource Library
https://www.lung.org/lung-health-diseases/lung-disease-lookup/rsv/resource-library

To provide to patients:

GSK "RSV and Me" (patient information)
www.rsvandme.com

Abrysvo Stay Connected program (sign up required)
https://www.abrysvo.com/stay-connected

Table 1: Arevxy® (respiratory syncytial virus [RSV] vaccine, adjuvanted), GlaxoSmithKline[7]

FDA Approved Indications, Dosage and Administration	Safety Considerations, Storage, Available Forms
Indications: Active immunization for the prevention of lower respiratory tract disease caused by respiratory syncytial virus in persons ≥ 60 years of age. **Dosage/Administration:** Administer a single dose (0.5 mL) as an intramuscular injection. Reconstitute with the accompanying vial of adjuvant suspension component (AS01E). Special populations: Arexvy is not approved for use in pediatrics or patients < 60 years of age.	**Adverse Events:** In clinical trials, the most commonly reported solicited local adverse reaction (≥ 10%) was injection site pain (60.9%). The most commonly reported solicited systemic adverse reactions (≥ 10%) were fatigue (33.6%), myalgia (28.9%), headache (27.2%), and arthralgia (18.1%). **Warnings/Precautions:** Fainting (syncope) has occurred following the administration of injectable vaccines, which could lead to significant secondary injuries. Protocols should be established to prevent injuries resulting from fainting. Ensure that proper medical care and supervision are available to address potential anaphylactic reactions that may occur after vaccine administration. Immunocompromised persons, including those receiving immunosuppressive therapy, may have a diminished immune response to Arexvy. **Contraindications:** History of severe allergic reaction (eg, anaphylaxis) to any component of the vaccine. **Storage:** For vials containing the adjuvant suspension component: Refrigerate between 2°C to 8°C (36°F to 46°F). Store in original packaging to shield from light. Avoid freezing, and if the adjuvant suspension component has been frozen, dispose of it. For vials containing the lyophilized antigen component: Refrigerate between 2°C and 8°C (36°F and 46°F). Store in original packaging to shield from light. Prevent freezing, and in case the antigen component has been frozen, discard it. After reconstitution, administer Arexvy immediately or store protected from light in the refrigerator between 2°C and 8°C (36°F to 46°F) or at room temperature [up to 25°C (77°F)] and use within 4 hours. Discard reconstituted vaccine if not used within 4 hours. Discard if frozen. **Available Forms:** Lyophilized recombinant respiratory syncytial virus glycoprotein F stabilized in pre-fusion conformation (RSVPreF3) as the antigen component. 120 mcg/0.5 mL [contains polysorbate 80]. Reconstituted suspension for intramuscular injection. [preservative free]

Table 2: Abrysvo™ (respiratory syncytial virus [RSV] vaccine), Pfizer[8]

FDA Approved Indications, Dosage and Administration	Safety Considerations, Storage, Available Forms
Indications: Active immunization for the prevention of lower respiratory tract disease (LRTD) caused by respiratory syncytial virus in persons ≥ 60 years of age and pregnant patients 32 through 36 weeks gestation for the prevention of LRTD and severe LRTD caused by RSV in infants < 6 months of age. **Dosage/Administration:** Administer Abrysvo as a single 0.5 mL dose via intramuscular injection. Special populations: Pregnant patients: Abrysvo has not been studied in pregnant individuals < 24 weeks gestational age, and those at increased risk for preterm birth.	**Adverse Events:** In clinical trials, the most commonly reported local and systemic adverse reactions in pregnant individuals (≥ 10%) were pain at the injection site (40.6%), headache (31.0%), muscle pain (26.5%), and nausea (20.0%). The most commonly reported (≥ 10%) local and systemic adverse reactions in individuals ≥ 60 years old were fatigue (15.5%), headache (12.8%), pain at the injection site (10.5%), and muscle pain (10.1%). **Warnings/Precautions:** To avoid the potential risk of preterm birth with use of Abrysvo before 32 weeks of gestation, administer Abrysvo as indicated in pregnant individuals at 32 through 36 weeks gestational age. Fainting (syncope) has occurred following the administration of injectable vaccines, which could lead to significant secondary injuries. Protocols should be established to prevent injuries resulting from fainting. Ensure that proper medical care and supervision are available to address potential anaphylactic reactions that may occur after vaccine administration. Immunocompromised persons, including those receiving immunosuppressive therapy, may have a diminished immune response to Abrysvo. **Contraindications:** History of severe allergic reaction (eg, anaphylaxis) to any component of Abrysvo. **Storage:** Store refrigerated at 2°C to 8°C (36°F to 46°F) in the original carton. Do not freeze. Discard if the carton has been frozen. After reconstitution, administer Abrysvo immediately or store at room temperature [15°C to 30°C (59°F to 86°F)] and use within 4 hours. Discard reconstituted vaccine if not used within 4 hours. **Available Forms:** Lyophilized antigen component (a sterile white powder containing recombinant RSV preF A and RSV preF B), a prefilled syringe containing sterile water diluent component and a vial adapter. 120 mcg/0.5 mL [latex free; contains polysorbate 80]. Reconstituted suspension for intramuscular injection. [preservative free]

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References

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4. Arexvy. Academy of Managed Care Pharmacy formulary dossier; September 2023.
5. Papi A, Ison MG, Langley JM, et al. Respiratory syncytial virus prefusion F protein vaccine in older adults. *N Engl J Med.* 2023;388(7):595-608.
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7. Arexvy [package insert]. Durham, NC: GlaxoSmithKline; 2023.
8. Abrysvo [package insert]. New York, NY: Pfizer; 2023.