Respiratory Syncytial Virus (RSV) – A Risk for All Children Under Two Years of Age

What Is RSV?

Respiratory Syncytial Virus (RSV) is a virus that may cause a wide range of diseases ranging from mild upper respiratory illness to life-threatening lower respiratory tract infections (LRTIs).[1] Children and adults may be infected repeatedly with RSV. Reinfections are common throughout life but typically present as a minor cold after the first few years. Disease severity increases again in later life, thus hospitalization is most common among older adults with preexisting comorbidities and newborns.[2,3]

How Prevalent and Severe Is RSV?

It is estimated that 3.6 million RSV-associated hospitalizations and approx. 100.000 RSV-attributable deaths occured in infants under five years of age in 2019. Of these, nearly 40% of RSV hospitalizations and almost half of RSV-associated deaths affected newborns less than half a year old. Most deaths occur in low- and middle-income countries.[4] It is not possible to predict which infants get seriously ill from RSV.

Usually, an RSV infection results in mild, cold-like symptoms.[1] However, it is also a **main cause of hospital admission** in infants and children.

In the first year of life, children are at the greatest risk of contracting an RSV infection.[4,5]

RSV is the main cause of LRTI-associated hospitalization in infants less than two years old.[6]

What Are the Symptoms of an RSV Infection?[7–9]

Mild Course

Common cold with:

- Cough
- Fever
- Rhinorrhea
- Wheezing
- Decreased appetite
- Irritability
- Decreased activity

Can usually be managed by a general practitioner or at home.

Severe Course

Bronchiolitis with:

- Cough
- Fever
- Wheezing
- Crackles
- Subcostal recessions
- Respiratory distress
- Apnea
- Nasal flaring
- Cyanosis
- Hypoxia
- Dehydration

Pneumonia with:

- Cough
- Wheezing
- Fever
- Tachypnea
- Hypoxia
- Chest and/or abdominal pain or vomiting

Hospitalization is mostly necessary.

Potential Long-Term Complications[10]

- Recurrent wheezing/ asthma
- Reduced lung function/ increased airway reactivity
- RSV-related respiratory morbidity
- Decreased quality of life

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What Are the Risk Factors for a Severe RSV Infection?[11–13]

Genetic and Socio-demographic Factors

- Age below 12 weeks
- Male sex

Pre-Existing Conditions

- Preterm birth
- Bronchopulmonary dysplasia
- Congenital heart diseases
- Immunodeficiency
- Cerebral palsy
- Down syndrome
- Malnutrition

Environmental Factors

- Visiting day care
- Household crowding
- Passive smoking
- Pollution
- Older siblings
- Non-breastfeeding

"Severe RSV cases are difficult to predict. RSV is a leading cause of hospitalization among infants in their first year of life. Although preterm infants and infants with co-morbidity are at high risk for severe infection, approximately 80% of infants hospitalized with RSV are otherwise healthy."

Dr Elena Bozzola,
Secretary of the Italian Paediatric Society, Paediatric Infectiologist at IRCCS Bambino Gesù Children Hospital, Rome, Italy

How Is the Virus Transmitted?

Transmission:[1]

- Via droplets from an infectious person to a contact person through sneezing and coughing.
- The nasal mucosa, the throat, and the conjunctiva form the portal for the virus.
- Transmission can also occur indirectly through contaminated hands, objects, and surfaces. The virus can survive in form of respiratory exudate for:
  - **20 minutes** on hands.
  - **45 minutes** on cotton coats.
  - Up to **several hours** on single-use gloves, stethoscopes, toys, and synthetic surfaces.

Incubation and Contagiousness:[1,3,14]

- The incubation period, or the time between infection and symptom onset, ranges from 2 to 8 days, and people with an RSV infection are typically contagious for 3 to 8 days. In more severe cases, a person infected with RSV can be contagious for up to 4 weeks.
- Infants and children can transmit the virus even if they are immunized.
- Adolescents and adults might transmit the virus with and without symptoms.

How Is RSV Diagnosed?

A physical examination considering the patient's age can provide an indication of a clinical diagnosis. To confirm the suspected diagnosis, a pathogen detection can be performed (e.g., via polymerase chain reaction (PCR) or rapid antigen-based testing).[1]

How Is RSV Treated?

Guidelines significantly differ throughout Europe and globally.[15–18] **Supportive care** is the primary objective of disease management to ensure adequate hydration and nutrition along with additional oxygen and mechanical ventilation as required. Severe cases of RSV infection may also require blood transfusion, tube feedings, dialysis, or cardiac catheterization.[17,19] Milder cases may be managed at home.[1] The use of corticosteroids, beta-adrenergic agents, or (hypertonic) saline solutions is not routinely recommended.[17,18,20]

Can RSV Be Prevented by Medical Prophylaxis?

For a long time, preventing severe RSV infections relied primarily on monthly injections of a short-acting monoclonal antibody (Palivizumab), limited to high-risk groups, such as preterm infants or those with specific health conditions[22] (for more details, see the *EFCNI Position Paper on RSV in preterm infants*). But recent advances offer new immunization options to protect infants:

- A maternal RSV vaccine (Abrysvo) has been approved for pregnant women between 32 and 36 weeks of gestation (GA) in several countries, including the US[23] and the EU in 2023. The vaccine provides protective antibodies to infants via placental transmission for effective[24] RSV protection in their first months of life.[1,25]
- A long-acting monoclonal antibody (Beyfortus) has been approved in many countries, including the EU[1,26] in 2022 and the US[27] in 2023, for the prevention of RSV lower respiratory tract disease (LRTD) in neonates and infants 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. It provides effective, durable protection through direct administration of protective antibodies to the children.[1,28-32]

Which Treatments and Prophylactic Measures Are Under Development?

Further active and passive immunization options are in various stages of development to protect all children. These include:[33,34]

- Pediatric vaccines for toddlers
- Other monoclonal antibodies

How Can RSV Be Prevented in Healthcare Facilities?

To prevent nosocomial infections, disinfection as well as hand washing with alcohol-based rubs besides handwashing with soap and water are considered effective in limiting the spread of RSV. Wearing gloves, masks, and gowns helps contain the infection.[34]

In case of contact with an infectious patient, the following measures are recommended:[35]

Hand Hygiene and Disinfection:

- Before and after contact with patients, prior to aseptic activities.
- After contamination (contact with blood, secretions, or excretions).
- After contact with the patient's environment.
- After taking off disposable gloves.

Barrier Measures:

- Wearing of non-sterile disposable gloves if there is a likely occurrence of contact with blood, secretions, excretions, or potentially contaminated surfaces.
- Wearing of an apron or gown to protect work clothes from direct contact with blood, secretions, excretions, or other contaminated materials during interventions or care procedures.
- Wearing of a face mask to prevent droplet transfer.
- Isolation of infected patients.

Surface Disinfection:

- At least daily disinfection of high-risk surfaces with frequent hand and skin contact.
- In case of visible contamination, immediate reprocessing.

"Raising public awareness is the most important step in our fight against RSV infection."

Prof. Louis Bont, Chairman of the ReSViNET Foundation

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Which Information Should Parents/Caregivers Receive? Give Details About…

- RSV transmission
- Symptoms and severity
- Risk factors
- Criteria for hospitalization
- Treatment and follow-up
- Prevention methods

How Should Information Be Provided?

Written: To provide detailed, yet easily understandable, medical information.

Orally: To discuss concerns and respond to questions.

When Should Parents/Caregivers Be Informed?

- During pregnancy, inform about the different prevention solutions
- Before discharge from the hospital after birth
- During early routine visits after birth
- Regularly during infancy and early childhood, particularly before and after RSV seasons
- Beyond parents, information should also be targeted to close family members and further caregivers[35]

Parent-Friendly Examples for Written/Online Information

- EFCNI Parent Booklet "RSV – Why parents of all infants should be aware of Respiratory Syncytial Virus" [a]
- ReSViNET Educational Platforms[b]

[a] https://www.gfcni.org/fileadmin/www.gfcni.org/Campaigns/RSV_All_Infants/Parent_Booklet/RSV_Parent_Booklet_5th_Edition_2024_English.pdf
[b] https://resvinet.org/learning-hub/ and https://resvinet.org/patient-network/

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About GFCNI

The Global Foundation for the Care of Newborn Infants (GFCNI) is the first global organization and network to unite patients, families, healthcare professionals, medical staff, and scientists from different disciplines, fields, and countries – all with the joint goal of advancing the health and quality of care for newborns and their families across the globe. We envision a future where every baby born receives the right care, at the right time, in the right place!

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