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# Experience with the use of palivizumab together with infection control measures to prevent respiratory syncytial virus outbreaks in neonatal intensive care units

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**Summary** Respiratory syncytial virus (RSV) frequently causes nosocomial outbreaks in general paediatric wards and occasionally in neonatal intensive care units (NICUs). Conventional infection control measures often fail to prevent the spread of RSV, and it can cause significant morbidity especially in preterm and young infants. We report our experience in preventing an outbreak on a NICU after RSV had been detected in a premature infant. The index case was a 34-day-old premature infant who presented with clinical infection and RSV was detected in a clinical specimen. There were 11 patients in the ward at the time including the index case. The RSV-positive patient was isolated, the ward closed to admissions and infection control measures were implemented. Two patients were transferred to another hospital. Palivizumab 15 mg/kg i.m. was given to all patients and no further cases occurred. All subsequent RSV tests on nasal secretions were negative. Palivizumab combined with conventional infection control measures appeared to prevent the spread of RSV in this NICU. Strategies for the prevention of RSV outbreaks on NICUs all recommend the reinforcement of routine infection control measures. Recommendations concerning the use of palivizumab range

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from monthly prophylaxis to all infants at risk, to prophylaxis of selected cases only. Currently there are no guidelines for the use of palivizumab in NICUs or for the control of RSV outbreaks.


## Introduction

Respiratory syncytial virus (RSV) is the main cause of bronchiolitis and pneumonia in infants and is responsible for significant morbidity and mortality. Patients in neonatal intensive care units (NICUs), with a history of prematurity, chronic lung disease (CLD) or congenital heart disease (CHD) have the highest risk for severe morbidity and death due to RSV infection.[1,2]

RSV causes frequent nosocomial outbreaks in general paediatric wards.[3] Outbreaks in NICUs are less common but if they do occur, they can lead to severe morbidity and mortality in preterm infants and result in increased costs.[4–7]

The transmission of RSV occurs directly by infectious secretions that are transferred by hand contact or indirectly by contaminated objects or by droplet spread. Infection control measures have been effective in controlling RSV transmission in healthcare facilities and are recommended to prevent spread.[8] Emphasis is placed on hand washing, the use of gloves and gowns and cohorting. The exact role of each of these measures in preventing the spread of RSV has not been determined. There are no such data available from NICUs.[9]

Palivizumab is a humanised IgG monoclonal antibody directed against an epitope in the A antigenic site of the fusion protein of RSV which neutralises RSV highly effectively. Palivizumab is widely used as RSV prophylaxis in preterm infants, infants with chronic lung and congenital heart disease.[10–12] The monoclonal antibody is administered once a month i.m. during the RSV season and has proven to be effective in preventing hospitalisation due to RSV.[11,12] Currently there are no guidelines for the use of palivizumab in NICUs or for the control of RSV outbreaks. Different approaches to the administration of palivizumab have been used. These include the administration of palivizumab prophylaxis to all infants in a NICU during the RSV season, prophylaxis only to infants at increased risk of RSV, prophylaxis to patients on a NICU after rapid testing for RSV and the restriction of prophylaxis to infants at high risk.[6]

## Methods

### Neonatal intensive care unit and patients

The NICU is part of a tertiary care perinatal centre at a municipal hospital in Vienna, Austria. The unit has about 200 admissions per year admitted from the obstetric department of the centre, which in turn has about 2000 births per year. The NICU has three rooms. One room has six incubators, and the other two rooms may nurse up to three infants each. During the day, one nurse cares for two infants. During the night shift, one nurse cares for three infants. A family-centred model of patient care is provided which allows parents to remain on the ward all day and which encourages them to have physical contact with their babies. Older brothers and sisters are occasionally allowed to visit siblings for a short time if they are apparently healthy.

### Index case, testing and infection control measures

In January 2007, during an RSV epidemic and while several RSV-infected children were patients in the general paediatric ward, one of the infants on the NICU clinically deteriorated and was found to be RSV positive. The NOW® RSV Test Kit (Inverness Medical, Binax, Inc., Scarborough, ME, USA) was used to test clinical specimens.[13]

At the time of RSV detection in the index patient, there were 11 infants in the NICU. The characteristics of the patients on the ward at the time of the RSV outbreak are shown in Table I.

Two infants were transferred to another hospital on the day of RSV detection.

On the same day the NICU was closed to elective admissions and gloves, masks and gowns were used in the care of all patients. Visits were restricted to the mothers, who also had to wear masks and gloves when in contact with their infants. The head of the ward assured compliance with the implemented measures Table II.