# Rotavirus Immunization for Hospitalized Infants: Are We There Yet?

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The Advisory Committee on Immunization Practices and the American Academy of Pediatrics support rotavirus vaccination of preterm infants according to the same schedule and precautions as term infants with an important stipulation: the requirement that the vaccine should be administered at or after hospital discharge because of the concern for rotavirus vaccine shedding and the unknown impact of potential nosocomial spread.[1,2] This requirement leads to unnecessarily missed vaccinations. Some hospitals have opted to immunize premature eligible infants before discharge because they perceive the risk of leaving an infant susceptible to rotavirus disease outweighs the risk of nosocomial spread. Monk et al[3] have previously reported their experience immunizing infants in the NICU with pentavalent rotavirus vaccine (RV5) and found that all immunized infants tolerated vaccination: 25% were asymptomatic, 51% were symptomatic but unchanged from baseline, and 24% had clinical status changes that were not attributed to RV5. They examined the clinical status of neighboring unimmunized infants and found that only 1% developed nonspecific gastrointestinal symptoms or fever, not attributed to RV5, although shedding was not evaluated.[3]

In this issue of *Pediatrics*, Hofstetter et al[4] evaluate nosocomial spread among infants in a hospital where immunization of eligible infants with RV5 was allowed, filling in the gap of previous literature. Infants were included if they were age-eligible for RV5 in an ICU (neonatal, cardiac, or pediatric) and if a stool sample was collected for rotavirus polymerase chain reaction testing and genotyping. Of 1192 collected stool specimens, only 1% ($n$ = 13) tested positive for rotavirus: 1 wild-type virus from an unimmunized infant and 12 vaccine strains shed from immunized infants. No reassortants (rotavirus strains resulting from wild-type and vaccine strain mixing) were identified. Others have evaluated safety and viral shedding after RV5 administration in the NICU with similar reassuring findings.[5]

Per current recommendations, the window for administration of rotavirus vaccine closes at 15 weeks of age.[1,2] By recommending rotavirus vaccine administration on or after discharge from the hospital, we allow critically ill infants who have required long hospital stays to leave the hospital susceptible to rotavirus. The institution where Hofstetter et al's[4] research was conducted allows immunization of eligible infants while hospitalized, yet only 32% of those eligible were immunized before discharge. Of those not immunized, 42% were no longer eligible because of age. Another article by Stumpf et al[6] has reported that 63% of very low birth weight infants did not receive rotavirus vaccine at discharge, with 75% of these infants being too old at discharge, a dismaying number of missed opportunities for vaccination.

Biases are likely playing a role in our individual, institutional, and policy decisions about in-hospital rotavirus

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immunizations. Omission bias ("I don't want to cause harm by my actions") leads us to fear the "action"; we fear that the clinical status of an infant will change because of immunization or that shedding might harm neighboring infants or result in reassortants. Meanwhile, we fail to recognize the harm that comes from our "inaction": not immunizing eligible infants. One fear is that symptoms associated with the vaccine (ie, fevers, abdominal distension, loose stools) may prompt clinical interventions such as blood draws, radiographs, and holding feeds. Lifting immunization restrictions would allow clinicians to determine which eligible infants are stable enough to be immunized during their prolonged hospital stay to avoid future missed opportunities for vaccination. Another fear involves reassortants, which have never been reported in the NICU or hospital setting. Reassortant viruses have mostly been reported in asymptomatic shedders, but there have been rare cases of symptomatic disease.[7,8] Optimism bias ("It won't happen to them") likely contributes as well. Rotavirus rates have decreased so much that we may feel falsely reassured about the low risk of acquiring rotavirus, leaving vulnerable infants unvaccinated and therefore susceptible to infection. In the current study, there was 1 wild-type rotavirus strain detected in an unimmunized infant, highlighting the importance of immunizing eligible infants while hospitalized and before their window for rotavirus vaccination closes.

It is time to allow otherwise eligible infants who are clinically stable to be immunized while still in the hospital. Data from this study are reassuring, as are published and unpublished data from others who have taken the lead in immunizing infants while inpatient.[3–5,9] These institutions have recognized that shedding has historically induced herd immunity, which may result in asymptomatic transmission but rarely leads to disease.[10] Other countries, such as Australia, routinely allow administration of rotavirus vaccine to hospitalized infants.[11] Individual hospitals can decide if they choose to institute contact precautions for the duration of shedding or not. We favor standard precautions, with efforts directed at hand hygiene compliance, which promote prevention of nosocomial transmission of infections. However, fear of these potential effects is not reason enough to justify preventing inpatient rotavirus vaccination. We must keep our biases as clinicians in check to help our most vulnerable patients.

**ABBREVIATION**

RV5: pentavalent rotavirus vaccine

**COMPANION PAPER:** A companion to this article can be found online at www.pediatrics.org/cgi/doi/10.1542/peds.2017-1110.

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