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## Infection Control & Hospital Epidemiology



### Article

#### First View

# A Network Model of Hand Hygiene: How Good Is Good Enough to Stop the Spread of MRSA?

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## Abstract

Simulation models have been used to investigate the impact of hand hygiene on methicillin-resistant *Staphylococcus aureus* (MRSA) transmission within the healthcare setting, but they have been limited by their ability to accurately model complex patient–provider interactions.

Using a network-based modeling approach, we created a simulated neonatal intensive care unit (NICU) representing the potential for per-hour infant–infant MRSA transmission via the healthcare worker resulting in subsequent colonization. The starting prevalence of MRSA colonized infants varied from 2% to 8%. Hand hygiene ranged from 0% (none) to 100% (theoretical maximum), with an expected effectiveness of 88% inferred from literature.

Based on empiric care provided within a 1-hour period, the mean number of infant–infant MRSA transmissible opportunities per hour was 1.3. Compared to no hand hygiene and averaged across all initial colonization states, colonization was reduced by approximately 29%, 51%, 67%, 80%, and 86% for the respective levels of hygiene: 24%, 48%, 68%, 88%, and 100%. Preterm infants had a 61% increase in MRSA colonization, and mechanically ventilated infants had a 27% increase.

Even under optimal hygiene conditions, horizontal transmission of MRSA is possible. Additional prevention paradigms should focus on the most acute patients because they are at greatest risk.

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## Footnotes

## Linked references

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