



KEY POINT SUMMARY

OBJECTIVES

The objective of this study was to observe if hand hygiene practices varied among levels of neonate contact, their environment, and equipment. It also aimed to determine the hand hygiene practices of different personnel touching the infants and compare hand hygiene practices of two NICUs.

Factors associated with hand hygiene practices in two neonatal intensive care units

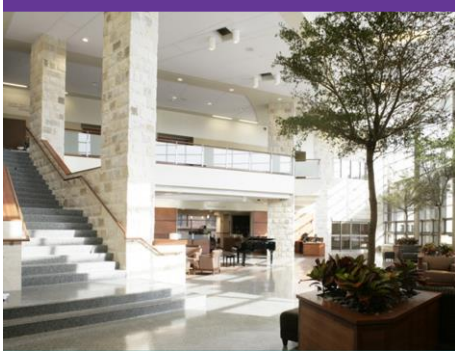
Cohen, B., Saiman, L., Cimiotti, J., Larson, E., 2003 | *Pediatric Infectious Diseases Journal*. Volume 22, Issue 6, Pages 494-499

Key Concepts/Context

It has been recognized that observing hand hygiene practices in intensive care environments is crucial to the prevention and management of the spread of healthcare associated infections (HCAIs). NICU infants are at a higher risk given their varying stages of underdeveloped immune systems, varying degrees of dependence on instruments, invasive procedures, and contact with healthcare providers. Cleaning hands before and after touching patients, their equipment, the surfaces of their environment, before procedures, and after removing gloves are considered some of the best practices for hand hygiene. Authors indicate adherence to hand hygiene practices among healthcare workers has been found to be less than 50%. This observational study looked at hand hygiene practices among staff in NICUs in two different hospitals. The study focused on determining if the practices varied with level of contact with neonates, their environment, and their equipment. The study found significant differences in hand hygiene practices among different staff members, among levels of contact, and between the two NICUs.

Methods

This study was part of a larger clinical study of staff hand hygiene practices in connection with HCAIs in neonates. This part of the study involved observations. The study was carried out in a Level III and Level IV NICU of two New York City university hospitals – both part of the same hospital system and having similar infection control policies, procedures, and staff education. Both NICUs had rooms having six to 12 isolettes and three to four sinks. The hand hygiene policy in NICU A involved using alcohol-based hand rub, washing hands with non-antimicrobial soap when soiled, and using gloves whenever neonates were touched. NICU B's hand hygiene policy involved washing hands with antimicrobial soap and using gloves only before touching body fluids. Both NICUs required practicing hand hygiene



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before invasive procedures, prior to and after patient contact, and after touching patient equipment and surfaces in the patient's surroundings. Two research assistants randomly selected a room in each hospital to observe during the day shift and chose isolettes that could be observed without any visual obstruction. Each time the neonates, their equipment, and their environment was touched, it was recorded. The following three variables were taken into consideration for categorizing the type of touch: individual touching (personnel or visitor); clean or unclean hands, whether gloved or not, and if gloved – fresh or used gloves; and level of contact – Level 1 being outside the isolette and its surroundings, Level 2 being inside the isolette but not the infant, and Level 3 being the infant. Observations lasted between 30 minutes to one hour. One-way analysis of variance was used to analyze data.

Findings

The research assistants completed 38 observations – 25 in NICU A and 13 in NICU 2 for a total of 41.6 hours. They observed a total of 1472 touches, of which >55% were made by nurses, about 17% by visitors, 13% by physicians-in-training, about 8% by other healthcare providers, and about 7% by attending physicians. A little over 28% of the touches were after hand hygiene practices of clean hands or use of new gloves. Almost 59% of the touches were with unclean or ungloved hands, and about 13% of the touches were made with used gloves. The most frequent type of contact was Level 3 (directly touching the neonates) – at over 50%. Touches outside the isolette and environment accounted for almost 38%, while touches inside the isolette accounted for more than 12%. Nurses were the individuals making more than 50% of all three levels of contact.

The hand hygiene practices of staff differed significantly with levels of contact. Hand hygiene was more frequently and appropriately adhered to when the neonates were being touched directly by nurses ($P=0.001$), attending physicians ($P=0.02$), and physicians-in-training ($P=0.03$). During Level 3 contacts, 55% of attending physicians, 49% of physicians-in-training, 55% of other healthcare workers, and 46% of nurses used new gloves or washed hands before touching neonates.

Nurses' use of unwashed and ungloved hands decreased as the level of contact increased – almost 75% of the times the infants outside of the isolettes were touched, >48% of the times the inside of the isolettes were touched, and about 32% of the times when the neonates were directly touched. Taking into consideration the touches of all staff, >82% of Level 1 touches, >53% of Level 2 touches, and about 43% of Level 3 touches were made using unwashed and ungloved hands. 80% of the observed touches by visitors were made with unwashed hands.



NICU B recorded significantly higher numbers of all touches (across individuals and levels) – 103.4 touches per neonate versus 65.2 in NICU A ($P=0.02$). Level 3 touches in NICU A were 29.1 times per shift as compared to 36.7 times in NICU B. Mean number of Level 3 touches with washed or clean-gloved hands was higher in NICU A (18.21) than in NICU B (6.69) ($P<0.01$). More attending physicians and other healthcare workers used clean and gloved hands for Level 3 touches in NICU A ($P<0.01$ for both). Clean hands were used more often by staff members in the NICU using the alcohol-based hand rub versus those in the NICU, which used the antimicrobial soap.

Limitations

The authors identified the following limitations for this study: Data were collected for only one month and all of it was during day shifts. Hand hygiene practices of specific individuals were not recorded, as the study required maintaining their anonymity. The study did not have the scope to determine if certain staff members practiced suboptimal hand hygiene continually or if some practiced appropriate hand hygiene routinely. Lastly, the observation instrument was untested.

Design Implications

The study indicates that staff in the NICU with the alcohol-based hand rub used clean/gloved hands more often than the staff in the NICU with antimicrobial soap. The authors note that the alcohol-based hand rubs were available at the bedside.

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