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# Effect of Wearing Shoes by Medical and Nursing Staff in PICU/NICU and Bacterial Contamination of Floors

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**Abstract:** ***Policy of wearing protective footwear or removing shoes while entering intensive care units(ICU) is enforced in most of the hospitals to curtail the spread of infections. (1) Some of the developed countries of the world have done away with this practice. Present study was a prospective one, carried out in a tertiary care teaching hospital of north India over a period of one year and an eye opener results were obtained. No difference was found in the floor contamination with and without shoes in pediatric intensive care unit (PICU) and neonatal intensive care unit (NICU).***

**Keywords:** Intensive care unit, Hospital infections, contamination, microbes.

## 1. Material and Method

Permission was obtained from the hospital administration and ethical clearance taken from institutional ethical committee. Medical and nursing staff working in PICU and NICU were allowed to work wearing shoes in PICU and by removing shoes or wearing protective footwears in the NICU taken as control. Housekeeping staff, attendants and visitors were not allowed to enter these areas with their own shoes. Weekly floor swabs were taken from these two areas simultaneously for bacterial culture. However viral and fungal cultures were not done Phenol cleaning of the floors was done by housekeeping staff between 7:30 and 8:30 AM daily and almost all nurses and doctors were there by 10 AM and hence floor stick swabs, wet in normal saline were collected every Monday betweeb 11 & 11:30 AM and immediately sent for culture to our own microbiology laboratory where both aerobic and anaerobic cultures were done.

PICU and NICU of the study hospital are located in the ICU Complex in the adjoining halls with common corridor where shoes are either removed and inside chappals/shoe covers are worn(Figure 1). Bacteria were identified and colony forming units(cfu) were measured.


**Figure 1:** Photograph of ICU Complex entrance where shoes are removed

## 2. Results

A total of 98 floor swab samples, 49 each from PICU and NICU were taken. Escherichia Coli (E Coli.) was isolated in just 2.04% of plates followed by pseudomonas 1.02%, Kleibesella 1.02% and enterobacter 1.02%. Amongst gram positive organism only methicillin resistant staphylococcus aureus (MRSA) was isolated in 2.04% plates. Almost same results were found from PICU & NICU and difference from two places was not stastistically significant (p value>0.05).

**Table 1:** Bacteria isolated from PICU and NICU

| BACTERIA | PICU | NICU | TOTAL |
|---|---|---|---|
| E.Coli | 1(2.04%) | 1(2.04%) | 2(2.04%) |
| MRSA | 1(2.04%) | 1(2.04%) | 2(2.04%) |
| Kleibsella | 0(0) | 1(1.02%) | 1(1.02%) |
| Enterobacter | 1(1.02%) | 0 | 1(1.02%) |
| Pseudomonas | 1(1.02%) | 0 | 1(1.02%) |

## 3. Discussion

Floor contamination in the hospital ward setting is mainly from patients, staff and visitors. Cleaning and disinfection (fumigation) have got a temporary effect on microbes contaminating these areas.

Earlier studies have proved that protective footwear (shoes and shoe covers) do not significantly effect floor contamination (1,2,3). This study further strengthens the same view point. Air colony counts in the PICU/NICU air were not done and fungal/viral cultures were not undertaken. These were the limitations of present study. MRSA & E.Coli remain the most common air born pathogens in ICU but they do not cause disease as they are rarely disposed at a distance of more than one meter and die rapidly(4). Use of airfilters and laminar airflow can further come over any apprehension about cross infection and contamination in ICU.

## 4. Conclusion

The removal of shoes or wearing shoe covers had no significant effect on bacterial contamination of floors in the PICU/NICU. However, visitors and housekeeping staff should continue to follow the present policy of removal of shoes. It should be done away with doctors and nurses. This can also save the expenses on shoe covers and clean inside footwears. We intend to continue this study for a longer period to have more meaningful and significant results.

## 5. Acknowledgement

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