

Examination gloves as barriers to hand contamination in clinical practice

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OBJECTIVE--To test the effectiveness of vinyl and latex gloves as barriers to hand contamination with gram-negative organisms and enterococci during routine hospital procedures.

DESIGN AND INTERVENTIONS--We studied 137 procedures during which a health care worker's gloved hand contacted a patient's mucous membrane and was thus potentially contaminated with gram-negative rods or enterococci. Quantitative hand cultures were obtained from each health care worker before and after the gloved contact using a modified glove juice method, and the exterior glove surface was also quantitatively cultured after patient contact. Used gloves were then tested for leaks using the American Society for Testing and Materials' watertight test.

SETTING--Harborview Medical Center, a 330-bed city-county hospital and level I regional trauma and burn center, is both a teaching facility affiliated with the University of Washington and the major provider of care to indigent and uninsured persons in Seattle-King County, Washington.

PATIENTS AND OTHER PARTICIPANTS--Respiratory therapists performing endotracheal tube care on intubated intensive care unit patients, registered nurses performing digital rectal stimulation for bowel training on patients with spinal cord injury in the rehabilitation ward, and dentists performing routine dental examinations and procedures on healthy outpatients in the dental clinic.

MAIN OUTCOME MEASURE AND RESULTS--Eighty-six of the 135 gloves cultured had gram-negative rods or enterococci on the external surface after use and were thus sources of potential hand contamination. Microbial contamination of the health care worker's hands occurred in 11 (13%; 95% confidence interval, 6% to 20%) of these 86

events, and was more frequent with vinyl (10 of 42) than latex (one of 44) gloves ($P < .01$). After use, glove leaks were also more frequent in vinyl gloves (26 of 61) than with latex gloves (six of 70) ($P < .001$). Even when leaks were present, gloves prevented hand contamination in 77% of instances and quantitative counts of microorganisms contaminating hands were 2 to 4 logs less than counts on external glove surfaces. Health care workers reported awareness of the presence of glove leaks in only seven (22%) of the 32 events in which leaks were subsequently demonstrated.

CONCLUSIONS--Under conditions of routine use, gloves effectively function as a protective barrier even when leaks are present. Latex gloves were less frequently associated with leaks and hand contamination. Since hand contamination occurred after 13% of exposures and cannot be readily identified by health care workers, routine hand washing should be done after each patient contact.

SOURCE: US National Library of Medicine (NLM) and PubMed