

Perspectives About Glove Effectiveness (8/09)

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This study explored dental and dental hygiene students', graduate students', and dental professionals' preferences for certain types of gloves and the reasons for these preferences, as well as their knowledge, attitudes, and behavior about the use of dental gloves as a means of barrier protection. The participants (198 dental and 46 dental hygiene students, 35 graduate students, and 79 dental professionals [28 dentists and 51 dental hygienists in private practice]) responded to a self-administered anonymous survey. Professionals (96.4% dentists and 92.2% dental hygienists) were found to be more likely to have a preference for certain types of gloves than students (79.2% dental students and 76% dental hygiene students) and graduate students (77.1%; $p=.033$). "Comfort" was most frequently reported as a reason for glove preference. Large percentages of respondents wrongly believed that gloves provide full protection (50.8% students, 25.7% graduate students, 30.4% professionals), thought that gloves provide protection as long as there is no visible tear (39.7% students, 28.6% graduate students, 18.2% professionals), and reported that they would not change gloves during an uninterrupted three-hour long procedure (32.2% students, 23.5% graduate students, 22.7% professionals). **These findings should alert dental educators about the importance of educating their students as well as practicing professionals clearly and comprehensively about infection control and the science and rationale supporting recommended guidelines.**



DECS Comment: Gloves are worn to protect both dental health-care personnel (DHCP) and patients and must be worn when touching mucous membranes, blood, and saliva. Wearing gloves does not eliminate the need for handwashing. Hand hygiene should be performed immediately before donning gloves and after glove removal because gloves can have small, unapparent defects or can be torn during use, and hands can become contaminated during glove removal.¹⁻¹² These conditions increase the risk of operative wound contamination and exposure of the DHCP's hands to microorganisms from patients.

Limited studies of the penetrability of different glove materials under conditions of use have been conducted in the dental environment. Consistent with observations in clinical medicine, leakage rates vary by glove material (e.g., latex, vinyl, nitrile), duration of use, and type of procedure performed,^{7,9,11,13-15} as well as by manufacturer.¹⁶⁻¹⁸ Studies have shown repeatedly that vinyl gloves have higher failure rates than latex or nitrile gloves when tested under simulated and actual clinical conditions.¹⁹⁻²² For this reason either latex or nitrile gloves are preferable for clinical procedures that require manual dexterity and/or will involve more than brief patient contact.²³

Even though the FDA has identified levels of maximum defects allowed for glove manufacturers, intact gloves eventually fail with exposure to mechanical (e.g., sharps, fingernails, or jewelry) and chemical (e.g., disinfectants, dimethacrylates) hazards over time. These variables can be controlled, ultimately optimizing glove performance, by 1) maintaining short fingernails, 2) minimizing or eliminating hand jewelry, and 3) using engineering and work-practice controls to avoid injuries with sharps. Additionally, washing gloves may cause "wicking," penetration of liquids through undetected holes in the gloves, and is not recommended.¹ OSHA regulations mandate that when gloves are torn, cut, or punctured, they should be removed as soon as possible.²⁴

Studies have demonstrated that health-care personnel, including DHCP, are frequently unaware of minute tears in gloves that occur during use.^{11,14,15,25} These studies determined that gloves developed defects in 30 minutes–3 hours, depending on type of glove and procedure. Several studies have reported that 44-83% of the leaks were not recognized^{7,8,10} and one study reported that 92% of individuals continued treatment with known leaks in their gloves.¹¹ Currently there is no consensus regarding an optimal time for changing gloves during procedures, however DHCP may want to consider changing gloves during long procedures for the reasons stated above.

Selected References

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