

Gloves

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Washing Utility Gloves (10/08)

Question: Can I wash my utility gloves?

Answer: Unlike gloves used during patient-care activities, utility gloves are not regulated by the Food and Drug Administration (FDA) and can be washed or disinfected for reuse. Utility gloves should be routinely inspected and replaced if tears, cracks or other signs of deterioration occur.



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Everything You Always Wanted to Know about Gloves...But Were Afraid to Ask (Originally published in Sept 2000)

Question: What are the most common gloves used in dentistry and why are they so popular? What factors should I consider when choosing gloves?

Answer: Obviously, the practice of dentistry involves the use of our hands. As dental providers we are routinely exposed to bacteria, viruses, and other oral microbes from blood and saliva. To protect ourselves, we wear gloves approximately 40 hours per week. The most common gloves currently used in dentistry are latex, nitrile, and vinyl. Nitrile and vinyl are referred to as synthetic gloves.

It is important to understand the differences between latex, nitrile, and vinyl with regard to their barrier properties, material strength, and potential weaknesses. Most dental procedures involve constant hand and finger movements which may weaken some synthetic materials. Also, specific dental-related chemicals, compounds, biocides, and chemical agents may weaken puncture resistance and glove strength, which can, in turn, compromise personal safety. If barrier integrity is compromised, exposure to pathogens (e.g., HIV, hepatitis) may occur.

The American Society of Testing and Materials (ASTM) has developed glove standards based on performance specifications. Latex, nitrile and vinyl have different strength, elongation, and thickness requirements, which shows how different they are from each other. See Table 1 for performance standards.

Table 1. Performance Standards for Different Glove Materials

Material	Applicable ASTM Standard	Thickness	Strength*	Elongation**
Latex	D3578	0.08 mm	14 MPa	700%
Nitrile	D6319	0.05 mm	12.5 MPa	500%
Vinyl	D5250	0.05 mm	9 MPa	300%

* How much pressure can be applied before rupture

** The length (%) a glove material stretches beyond its original length before it breaks

Appropriate glove selection requires that the user evaluate the conditions under which the glove will be used. It is important to understand and evaluate each glove material's durability as a barrier and its performance limits. The performance limits should be weighed against the perceived risk level. The following questions, for example, should be asked when choosing a glove material. Will there be contact with bodily fluids and the potential for bloodborne pathogen exposure? What is the hazard level? What is the procedure being performed? Will the procedure involve chemicals? Will the chemicals dissolve the glove material? Table 2 provides an overview suggesting limiting conditions for latex, nitrile, and vinyl gloves.

Table 2. Comparison of Glove Materials

	Latex*	Nitrile	Vinyl
Durability	Most durable; Highly resistant to punctures and tears; Good resistance to many chemicals**	Excellent durability; Highly resistant to punctures and tears; Effective against a wide range of chemicals**	Limited durability; Increased potential for punctures and tears; Of limited use with chemicals**
Indications for Use	Excellent choice for high-risk situations where exposure to bodily fluid may occur; Procedures requiring unrestricted hand and finger movement	Good latex alternative for high-risk situations; Excellent synthetic alternative for latex-sensitive individuals	Synthetic alternative for low-risk, short-term procedures; Procedures with limited exposure to body fluids

* **Warning:** Products containing natural rubber latex may cause allergic reactions. Individuals who are allergic to nature rubber latex should avoid these products.

** Request permeation test data from the manufacturer. The concentration of the involved chemical and the glove's thickness affect permeation.

Another important point to remember is that all three glove types can potentially initiate glove-associated reactions. The types of reactions and their etiologies vary. See Table 3 for an overview of glove-associated reactions.

Table 3. Glove-Associated Reactions

Reaction	Can Be Caused By	Specific Cause	Susceptible Population
Irritant contact dermatitis (Irritation)	Latex, nitrile, or vinyl	Chemicals, powder, soaps	Everyone
Allergic contact dermatitis (Type IV)	Latex, nitrile, or vinyl	Chemicals, powder, soaps	Only those with genetic predisposition
Immediate hypersensitivity (Type I)	Latex	Latex proteins	Only those with genetic predisposition

Use of powdered gloves can also affect staff members and patients. In addition to drying out our hands and causing skin irritation, the glove powder can also absorb chemicals and natural rubber latex proteins present on the glove's surface. When donning and removing gloves, we and our patients can be exposed to these chemicals/proteins through direct contact and/or by inhaling the airborne powder. This can result in breathing difficulties, potentially contributing to occupational, irritant or allergic asthma. Powder can also directly affect invasive dental procedures and provide nutrients to support microbial growth. This, in turn, can contribute to infection, trigger inflammation, and delay wound healing. Finally, glove powder left on contact surfaces can contribute to cross-contamination, something we always want to avoid in patient treatment.

In summary, when choosing a glove, we should evaluate the anticipated risk level (high, medium, low, or no risk), review the type and duration of procedure to be performed, examine the equipment to be used, and anticipate the potential for exposure to bodily fluids. We must ask ourselves whether a glove type will provide an effective barrier, whether it will maintain an intact barrier under repeated hand movement, and whether the glove can withstand chemical exposure.

The bottom line is that latex gloves are recommended for high-risk situations involving potential pathogen exposure. Nitrile is an excellent alternative to latex because it exhibits comparable barrier qualities; in addition, it is an excellent choice for latex-sensitive individuals. Vinyl gloves are appropriate for most low-risk, short-duration tasks. To reduce the potential for powder-associated complications, powder-free latex or synthetic gloves should be considered for all dental procedures.

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Nitrile Glove Woes (Originally published in Jan 1998)

Question: Why do my nitrile gloves rapidly fall apart when I dip my finger in monomer? Our safety and occupational health representative told us to wear these gloves, but they only seem suitable for handling doughy resin. When attaching handles to trays and smoothing the area, the gloves are worthless.

Answer: A technical representative at Dentsply/York advises that disposable nitrile gloves are designed for cleaning up spills of monomer. Although nitrile gloves are less permeable than latex gloves, they should be changed immediately if they come in direct contact with monomer. Unfortunately nitrile gloves are the only cost-effective gloves with the required manual dexterity suitable for working with monomer. Latex gloves are very permeable to methyl methacrylate and quickly deteriorate when exposed. You can try to eliminate exposure to monomer when making custom trays by dipping the end of the handle in monomer and using a tool to smooth the area. Another alternative to eliminate the use of liquid monomer is to use light-cured or thermoplastic tray materials.

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When Gloves Should be Worn in Dentistry (Originally published in the May 2001 issue of InCONTROL)

Question: When should gloves been worn in dentistry?

Answer: Gloves should be worn when there is reasonable likelihood of contact with blood or other potentially infectious materials (saliva), mucous membrane (intraoral), or nonintact skin; when performing vascular access procedures; and when handling contaminated items or touching contaminated surfaces. Gloves should be changed during a procedure if they become torn or punctured. It is important to wash your hands before donning and after removing gloves.

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Applying Hand Lotion Before Using Gloves (Updated September 2004)

Question: Are there any recommendations for the use of hand lotions while wearing gloves?

Answer: The primary defense against infection and transmission of pathogens is healthy unbroken skin. Frequent handwashing with soaps and antiseptic agents can cause chronic irritant contact dermatitis among dental health-care personnel (DHCP). Lotions are recommended to ease the dryness resulting from frequent handwashing and more recently to prevent dermatitis resulting from glove use. However, petroleum-based lotion formulations can cause breakdown of latex gloves. For that reason, lotions that contain petroleum or other oil emollients may affect the integrity of gloves and should not be used.

Therefore, when selecting hand-hygiene products, information should be obtained from the manufacturer regarding possible interactions of lotion and antiseptic products (e.g., alcohol-based hand rubs, antimicrobial soaps) and the effect of petroleum or other oil emollients on the integrity of gloves.

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Factors to Consider When Purchasing New Gloves (Originally published in the May 2002 issue of InCONTROL)

Question: Our clinic wants to purchase new gloves. What features should we consider when selecting gloves?

Answer: The following features should be considered when purchasing gloves.

1. Ease of donning. Are the gloves easy to put on when hands are dry and when they are damp?
2. Barrier protection. Do the gloves provide an intact barrier without holes?
3. Durability. Are the gloves resistant to tearing and puncture when in use?
4. Consistent fit over time. How well do the gloves fit when first placed and after extended use?
5. Tactile sensitivity. Is the user able to manipulate small objects with the gloves?
6. Grip. Can the user grasp and hold slippery objects?
7. Comfort. Does the user complain of cramping and/or fatigue?
8. Non-irritating. Does the user complain of skin irritation?
9. Cost. How much do the gloves cost compared to the gloves that are presently being used?
10. Protein levels. If considering latex gloves, what is the protein content?
11. Powder or powder-free. Does the clinic want powder-free gloves?

Include the end-users when selecting the right glove for use. Determine the risks associated with the tasks to be performed while wearing the gloves, such as contact with blood or other body fluids, sharp instruments, or specific chemicals. Determine if any of the users are sensitive to glove materials. Of course, cost is an important consideration when purchasing gloves, but the clinic must also consider the cost of poor product performance, waste, and employee downtime due to illness.

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Substituting Non-Sterile Exam Gloves for Sterile Surgical Gloves When Doing Surgery (Originally published in the Jan 2002 issue of InCONTROL)

Question: Our clinic budget for supplies has been reduced. Can we use non-sterile exam gloves instead of sterile surgical gloves when doing surgery?

Answer: No. While there is minimal scientific evidence pertaining to post-operative infections among dental patients treated with sterile vs. non-sterile gloves, strong theoretical rationale supports the wearing of sterile gloves by all team members involved during a surgical case. Sterile surgical gloves must meet standards for sterility assurance established by the Food and Drug Administration. Sterile surgical gloves are less likely than non-sterile gloves to harbor microorganisms that may contaminate the operative site.

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