

LIFE AFTER LATEX: ALTERNATIVES TO LATEX GLOVES

A RECENT *CD Summary** that addressed latex allergies prompted many readers to ask, "Do alternative glove products provide adequate barrier protection against blood, other body fluids, and, ultimately, microorganisms. Herewith, then, is an overview of alternative glove materials that are presently available for use in medical situations.

Natural rubber latex gloves (latex gloves) are a safe and cost-effective glove material for the majority of individuals needing barrier protection. However, protein allergens in latex gloves have been found to cause Type I (immediate) hypersensitivity reactions in sensitized people. The powder on latex gloves can act as an airborne carrier of latex proteins, which can sensitize and produce allergic reactions in susceptible health care workers and patients.¹ For those with a diagnosed Type I latex allergy, there is no guaranteed safe level of exposure. Symptoms range in severity from immediate contact urticaria to respiratory problems and, rarely, to life threatening anaphylaxis. Type I latex allergy affects approximately 10% of health care professionals.^{2,3}

Use of latex gloves is also associated with Type IV (delayed onset) allergic contact dermatitis. Symptoms of Type IV allergies typically develop anywhere from 6-48 hours after contact with the allergen, and include a red rash and areas of soreness and skin cracking. Symptoms are usually localized to the hands, but occasionally extend beyond the glove to the forearm. Type IV glove allergies are usually caused by chemicals, such as thiurams, carbamates, and thiazoles, that are added to the latex during manufacturing to accelerate the vulcanization process, increase the elasticity, strength and durability of latex gloves, and to prolong shelf life.

FDA APPROVAL AND TESTING REQUIREMENTS

In 1991, the U.S. Occupational Safety and Health Administration (OSHA) enacted the Bloodborne Pathogen Standard, 29 CFR 1910.1030.^{4,5} The standard specifies that appropriate gloves are to be used. It does not specify the use of any particular glove material. Medical grade gloves are considered Class I medical devices and are regulated by the U.S. Food and Drug Administration (FDA).⁶ All glove products must meet acceptable quality levels for physical specifications, elasticity, elongation, defect and pinhole rates, powder levels, protein levels, allergenicity or biocompatibility (as appropriate to the glove material), set by the American Society for Testing and Materials (ASTM).⁶ Any glove meeting the FDA requirements is considered to provide adequate barrier protection against pathogens, such as HIV and hepatitis B and comply with the OSHA Bloodborne Pathogen Standard.

ALTERNATIVE GLOVES

The properties, performance characteristics and costs of alternative glove material varies. It is important to match the performance needs of the user (including duration of wear, type of procedure, and use of chemicals or sharps) with the qualities of the glove. No one material, including latex, performs perfectly in all situations, so health care professionals should plan to use different gloves for different purposes. To do this, obtain as much technical information about the gloves as possible from the manufacturer, and test the performance of sample gloves in your practice setting.

Powder-free, low protein gloves

While made out of natural rubber latex, powder free, low allergen latex gloves have lower levels of the proteins that can cause allergic reactions. These latex gloves avoid the problem of distributing airborne latex proteins throughout an operating room or clinic. Use of non-

powdered, low allergen latex gloves should also reduce the potential for sensitization among workers who are not yet allergic. However, patients and workers who are diagnosed with Type I latex allergy may still react to these gloves and must use non-latex gloves to minimize the risk of future allergic reactions. It may be necessary to change the type of gloves used by co-workers, as latex proteins deposited on materials and surfaces, even in the absence of powder, may cause symptoms in a latex allergic worker. The cost of powder free, low allergen gloves is slightly higher than regular powdered latex gloves.

Non-latex gloves

A variety of medical grade glove materials now meet ASTM testing standards and FDA guidelines and are available for surgical and clinical/exam purposes.

Vinyl. Several manufacturers offer medical grade vinyl exam and surgical gloves (both in powdered and powder-free versions). Medical grade vinyl and latex gloves can perform similarly in terms of tensile strength and elongation, but latex is somewhat more durable and less likely to leak in use than vinyl.^{7,8,9} Manufacturers may recommend that vinyl gloves not be worn for procedures lasting longer than 30 minutes, in order for maximum barrier protection to remain effective. Double gloving with vinyl gloves is practiced in some surgical situations where latex allergy is a problem for patients or staff. The gloves are changed every 30 minutes. Vinyl gloves cost about the same as latex.

Nitrile. Nitrile gloves are reported to be more resistant to tears and punctures, and degradation by chemical agents, than either latex or vinyl. They are also reported to perform as well or better than latex gloves in terms of durability and pathogen barrier protection. However, nitrile gloves, like latex gloves, are manufactured through a process of vulcanization, and may contain chemical additives similar to those used in latex gloves that can cause Type IV allergic reactions in some people. Information

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about the presence of these chemicals can be found in the technical specifications prepared by each glove manufacturer. Nitrile gloves are somewhat more expensive than either latex or vinyl.

Neoprene. Neoprene gloves provide pathogen barrier protection similar to latex. The strength, elasticity and fit comfort of neoprene are also close to that of latex. Neoprene is vulcanized and may contain chemical additives, including latex and nitrile. Neoprene gloves are most commonly used in the operating room, but they are spendy, costing over a buck a pair.

Thermoplastic elastomer: Thermoplastic elastomer (TPE) gloves have a tensile strength equal to or superior to that of latex, without the latex allergens or the chemical additives that can induce allergic reactions. An initial report found that TPE's effectiveness as a barrier to bloodborne pathogens was equal to or better than that provided by latex.¹⁰ Partly because they are new on the market, TPE gloves are more expensive than latex or other glove materials.

DEVELOPING SAFER POLICIES

Many health care facilities and practices are beginning to evaluate their need for glove alternatives, and are starting to diversify the types of medical gloves and other products they use. Some begin with latex-free carts or trays that can be used for patients sensitive to latex. Others designate one exam room as a latex-safe environment. A common first step is to use only non-powdered, low allergen latex gloves. Shriner's Hospital for Children (in Portland) has successfully eliminated the use of latex gloves and has reduced other latex-containing products.⁸

Most medical glove suppliers offer a variety of acceptable products. Information about latex-free products (medical, dental and household) is available on the Internet. Some sites that focus on latex allergy issues and alternative products are listed below, although the Health Division cannot endorse or verify the accuracy of the information or opinions presented at these sites.

Latex Allergy Links

http://pw2.netcom.com/~nam1/latex_allergy.html

Cleveland Clinic Foundation:

<http://gasnet.med.yale.edu/gta/latex/latxhome.html>

Delaware Valley Latex Allergy Support Network

<http://www.latex.org>

Foundation for Latex Allergy Research and Education

<http://www.flare.org>

Selecting the Right Glove

www.immune.com/rubber/nr3.html

DON'T FORGET HAND WASHING

With all the attention and controversy focused on gloves these days, we must not forget that gloves are only one component of an effective infection control strategy. As we have all been told before, "wearing gloves does not replace the need for hand washing." Any glove can have small inapparent defects. They can be torn during use, and hands can become contaminated when gloves are removed. For all of these reasons, hand washing remains the single most important measure in infection control.

REFERENCES

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Influenza Wrap-up

YET ANOTHER flu season has sputtered to a close. Effective immediately, the Oregon State Public Health Lab is declaring victory and suspending its annual "rule out influenza" surveillance. It was a hard-fought victory for all Oregonians, and we thank participating clinicians for their contributions.

Overall, the past season can be described as "mild." At the OSPHL, influenza virus was cultured from 77 (14%) of the 544 specimens received this season—suggesting that the predictive value of a clinical suspicion is pretty low. (Of course, we have no way to guess how many of these specimens came from patients whom the clinician thought probably [cf. possibly] had influenza.)

Of the 77 isolates cultured, 62 were serogroup A, comprising 35 H3N2 bugs, 1 H1N1, and 26 that have not been typed. Fifteen serogroup B specimens were identified. Overall reports peaked in January and February, and appear headed to extinction now. History suggests that they will be back.

Of course, the end of the free testing program does not necessarily mean the end of influenza virus transmission. Sporadic cases may occur at any time.