Patient safety

Is converting to synthetic gloves necessary?

OR Manager asked a leading researcher and expert on latex allergy, Kevin J. Kelly, MD, to comment on the following question:

Is it necessary to convert entirely to synthetic surgical gloves in the OR to create a “latex-safe” environment for patients and health care workers?

Recently, 2 major academic medical centers have chosen to eliminate latex gloves from their institution and buy only gloves not made from natural rubber latex (related article). One of these institutions, Johns Hopkins, was responsible for introducing the first use of surgical latex gloves in the US. In addition, extraordinary researchers on latex allergy are from the same university: Robert Hamilton, PhD; Robert Brown, MD, MPH; and N. Franklin Adkinson, MD.

So what is going on? Why make this change now after allergic reactions have almost been eliminated compared to the peak of allergic reactions in the late 1980s to mid 1990s? Before commenting, it is important to review what we know about latex gloves, latex allergy, and safety of patients and health care workers.

What do we know?

1. Latex materials made by a dipping method, heat vulcanized at a low temperature, and cured for a relatively short time contain the most latex protein allergen. Natural rubber latex examination and surgical gloves are examples of these.

2. Most gloves used in hospitals (approximately 90%) are examination gloves and not surgical gloves. Even in the OR setting, more examination gloves are used than surgical gloves. Thus, focusing on the major source of latex allergen in a hospital would not involve surgical gloves primarily.

3. In the late 1980s to about 1995, latex gloves contained nearly 1,000-fold more latex allergen than the gloves on the market today.

4. Most reported allergic reactions in patients to latex in the hospital setting are due to exposure to latex gloves by either direct contact (skin or mucous membrane) or inhalation. Other latex products are minor contributors to causing allergic reactions to latex.

5. Occupational asthma from respirable latex allergen was associated with latex glove allergen carried by highly cross-linked starch donning powders aerosolized into the ambient air. A majority, but not all, of latex gloves on the market today are powder free. This alleviates some of this concern.

6. The use of powder-free latex gloves with lower allergen content has been associated with a reduction in the number of reported latex allergy reactions in patients and health care workers. However, this rate is still not zero.

7. Three prospective studies have suggested, but have been inconclusive, that the use of powder-free low-allergen latex gloves reduces occupational sensitization rates to latex.

8. General population studies suggest that 6% or more of the general population may have anti-latex IgE antibody (the antibody responsible for inducing an allergic reaction) in the blood from unknown routes of sensitization. At best, 1% of patients
identified by skin prick testing have anti-latex IgE antibody in the blood. Although these blood and skin tests may represent false positives (the test is positive, but the patient doesn’t have an allergic reaction upon exposure to latex), the technology is not sophisticated enough at this time to tell us who will have an allergic reaction and who will not.

9. Commercial serologic tests only have a sensitivity of finding a latex-allergic patient 75% of the time. More important, 25% of latex-allergic subjects (individuals known to react to latex protein with a clinical allergic reaction) tested will have a falsely negative test.

10. Latex gloves have been repeatedly found to be superior in preventing glove failure (pinholes or tears), which limits risk of viral penetration compared to nonlatex gloves. This is an important concern for preventing contamination with blood-borne viral pathogens.

Despite the latest experience in Cleveland, many surgeons and nurses find surgical latex gloves to be more comfortable and perceive them to have improved dexterity and reduced hand fatigue with prolonged use compared to synthetics. A change to synthetics may lead to disgruntled users.

**What outcomes are we looking for?**

So what we should do depends on what outcome we are looking for.

If we wish to eliminate all sensitization and all allergic reactions to latex gloves in workers and patients, then elimination of latex gloves is necessary. This approach of using no latex gloves has been deemed necessary in patients with spina bifida who have been sensitized at a prevalence of almost 68% in some studies. That recommendation has not been changed. However, we may inadvertently increase the risk of viral bloodborne pathogen transmission with this global approach.

In addition, surgical dexterity may be compromised with potentially significant individual harm resulting to the patient. The cost of care may be significantly raised by buying more expensive gloves. There is also a significant cost in the loss of a physician, nurse, or health care worker from the workforce. Having a severe reaction in a patient has an increased cost as well. The reduction of allergen in latex gloves has likely reduced the exposure to levels that will stop sensitization for most subjects except in those who are the most atopic.

Overall, the use of powder-free latex gloves has resulted in rare clinical allergic reactions to latex in health care in 2008. Sensitized health care workers using synthetic gloves, even those with latex induced asthma, have been able to work safely in hospitals when the aeroallergen from others’ use of powdered latex gloves is stopped. Most experts believe this approach is safe, effective, and still warranted. Unfortunately, the inability to have a rapid and more sensitive test for latex allergy suitable for mass screening has likely pushed some medical centers to go to the extreme and remove latex gloves completely.

The track record of the past 10 years of reduced allergic reactions to latex suggests eliminating latex gloves may be an overreaction. That does not mean that institutions that choose to remove latex gloves from use are wrong. They have weighed the risks and benefits and have concluded this is the safest approach, albeit more expensive. I worry about the unintended consequences because it is unclear if enhanced inadvertent transmission of bloodborne pathogens will become clinically relevant. We encourage the institutions that take this approach to monitor this closely.

—Kevin J. Kelly, MD
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