Synthetic Gloves: Eliminating the risks associated with latex gloves

Introduction

Latex allergy rates skyrocketed beginning in the late 1980s when glove use increased by 100-fold due to the implementation of universal precautions to prevent the transmission of infectious diseases such as HIV and Hepatitis B and C.[1] Recent impactful changes, such as awareness of latex allergy as a public health concern, labeling of latex, the ban on powdered gloves, and the growing trend of synthetic glove use, have been successful in controlling the latex allergy epidemic.[1-4] Yet, while latex allergy is considered to be under control, it will never be fully eliminated if latex is still present.[1] Latex sensitization and allergy persist, therefore, it is crucial to avoid latex despite the recent ban of powdered latex gloves.

Identifying Latex Susceptibility is Challenging

Likely an underestimated statistic, the general population has an estimated 1 to 6% risk of latex sensitization.[5] Nearly five times as many Americans may be sensitized to latex compared to those who suffer from a peanut allergy (up to 19.8 million vs. 4.28 million, respectively based on 2018 U.S. census).[5-7] There are several medical conditions and situations that are associated with an increased risk of latex sensitization. Among those at high risk are pregnant women, neonates undergoing surgical operations, and healthcare workers.[8-11]

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Increased Risk of Latex Sensitization[9-11]	
• Certain medical conditions (e.g. spina bifida, urogenital abnormalities, multiple congenital anomalies, cerebral palsy, pre-term infants)	• Occupations using latex gloves (e.g., healthcare workers, food handlers, hairdressers)
• History of intraoperative anaphylaxis of unknown etiology	• History of atopy and multiple allergies
• Interaction between central nervous and immune system	• Chronic bladder catheterizations
• Multiple operations, particularly as a neonate	• Fruit allergy (especially bananas)
• Reconstructive urologic surgery	• Patients undergoing OBGYN procedures

Repeated exposure to latex is the most significant risk factor.[5] With so many medical conditions and susceptible individuals, identifying latex susceptibility is complicated.

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50% of all latex-related reactions occur in the obstetric and gynecological setting. Latex is the leading cause of anaphylaxis in obstetric surgery. The obstetric population are exposed to multiple latex products over the course of their treatment leading to increased risk of sensitization. If anaphylaxis occurs during labor and delivery, it can lead to fatality in mothers and especially in neonates.[12]

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Healthcare workers are at especially high risk

The majority of all reported latex adverse events occur in healthcare workers (HCWs); thus, latex is considered an occupational hazard.[13,14] Many factors magnify the risk in HCWs including number of years worked in the healthcare setting, length of time gloves are worn, and history of allergic rhinitis, asthma, and/or atopic dermatitis.[1,15,16] A third of HCWs that are latex sensitized are O.R. personnel.[13,14] Latex allergy has a significant impact on sufferers that extend beyond the physical reactions. The fear of potential exposure can not only disrupt a person's lifestyle but can even require career changes.[17,18] HCW physical reactions may require workers compensation, lost productivity and risk of potential litigation.

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O.R. Teardowns can be costly to hospitals

To mitigate risks, at minimum, hospitals should consider always setting up the O.R. with non-latex or synthetic gloves. If the O.R. is set up using latex gloves and there is a late discovery of a patient risk of latex reaction, all the disposable supplies must be discarded and the reusable supplies re-sterilized. The cost impact of the lost O.R. time and wasted supplies ranges based on the type of case. One hospital reported a cost of $1,490 per O.R. teardown.[19] This number can increase substantially for orthopedic and cardiothoracic cases due to the large amount of instruments and supplies required.

Managing Latex Allergy in Patients and Healthcare Workers

Currently, there is no cure or vaccine for latex allergy or sensitivity. Per the Association of periOperative Registered Nurses (AORN), "the only effective preventative strategy at this time is latex avoidance."[20] To prevent exposure, hospitals should institute and evaluate strategies revolving around communication and documentation, knowledge and awareness, and product management.

Latex Allergy Management and Prevention Strategies[20]

Communication and Documentation	Knowledge and Awareness	Product Management
• EHR latex allergy alert	• Assess and address gaps in healthcare workers' knowledge and practices	• Use only latex-safe alternatives
• Partner with latex allergic patients and families	• Check all product labels for latex	• Latex-safe supply carts
• Latex precaution signs as visual reminders	• Annual competency of latex allergy	• Evaluate latex content
• Patient hand-off tools	• Review incident reports involving latex to identify trends and opportunities	• Alert frontline staff to any new products containing latex
• Synthetic gloves in all ORs	• Evaluate compliance	• Signage to distinguish both latex and latex-safe alternatives
• Inquire about latex allergies in preoperative communication		• Bar code technology
• Include allergies in the preoperative		

To identify and manage the risk of latex sensitization/allergy in HCWs, employees should be educated on the signs and symptoms of latex sensitization and encouraged to report such symptoms; latex allergy testing should be performed in those with symptoms or those deemed high-risk (e.g. use gloves regularly, existing allergies, and hand dermatitis or eczema).[10] Healthcare workers with latex allergy should be counseled on the risk of continued work and advised to use only synthetic gloves, avoid all latex-containing products, have proper allergic identification, and always carry an epinephrine auto-injector.

Hospital-Wide Latex Avoidance

Taking into consideration all the work that needs to be done, preparation in caring for known and high-risk latex allergy patients is labor intensive. Many hospitals, including Johns Hopkins Hospital and Cleveland Clinic, have chosen to institute a hospital-wide avoidance of latex gloves, recognizing the safety benefits outweigh any additional initial glove purchase cost.[21] A synthetic glove approach can decrease overall costs and hospital resource utilization by reducing the risk of latex anaphylactic reactions, lessening the latex exposure in both patients and HCWs, reducing the number of O.R. teardowns, minimizing O.R. idle time, avoiding potential lawsuits and worker's compensation claims, and optimizing product management and storage.

Synthetic gloves can actually reduce overall hospital costs

Alta Bates Medical Center in Berkeley, California performed a retrospective case study to quantify the costs associated with converting from latex to synthetic surgical gloves.[19] They calculated that each O.R. teardown costs approximately $1,490 when factoring in time and supplies lost due to an O.R. teardown. Despite the increased purchasing costs of synthetic surgical gloves post-conversion (**$36,773**), overall costs decreased by **$74,542**, reducing the overall costs by over **25%**. Cost savings are likely underestimated due to other factors not considered (i.e. worker's compensation, litigation, streamlining SKUs).

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Choosing the right surgical gloves for your staff is critical

Technology is easing the transition to synthetic gloves. Polyisoprene, a synthetic glove material, has the same molecular structure as latex, but in a synthetic form completely free of natural rubber latex. The properties of the glove are so close to latex that many clinicians cannot even tell the difference. As an example, one survey reported that 94% of surgeons rated comfort of Biogel® PI synthetic gloves as good or better than Biogel® Latex.[22]

When selecting synthetic gloves, glove quality can directly impact costs. Failure of glove protection can increase the risk of exposure to pathogens or bodily fluids. In addition, there are costs incurred to mitigate a glove failure such as irrigation of the wound, lost O.R. time and new gloves. Quality of surgical gloves can vary by manufacturer, which is often captured as in-use failure rate. In-use failure rates can range from one to eleven percent depending on the surgical glove used.[23] Your glove manufacturer can assist in the selection of the right gloves to meet the needs of your clinicians to balance protection and comfort.

In-use failure rates can range from 1% - 11% depending on the surgical glove used.[23]

Conclusion

Latex allergy and sensitization will never completely be eliminated as long as latex is still being used. However due to the collaborative effort in identifying and managing the later allergy epidemic, lives have been saved, jobs have been protected, and an economic disaster has been prevented.[1] While progress has been made, latex allergy still exists and sensitization continues; therefore, vigilance and proper management will always be required.

Managing patients and HCWs with known or high-risk latex allergy is both labor intensive and costly, which is why many facilities have switched to a latex-safe environment, converting to synthetic gloves as a primary risk-reduction measure.

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