Latex Allergy: Still a Challenge?

ALLERGIE AU LATEX : ENCORE UN DÉFI?

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Bien que l'utilisation des produits en latex date d'au-delà d'un siècle, les réactions allergiques aux protéines du latex ne sont reconnues en tant que grave problème de santé que depuis les 15 dernières années.[1] En 1987, quand l'Occupational Health and Safety Administration (OSHA) a instauré ses précautions universelles, le besoin des gants d'examen a vu une augmentation importante. Parce que tout le monde qui venait en contact avec le sang ou d'autres liquides organiques était maintenant obligé de se protéger les mains, le nombre de paires de gants utilisées par année, moins d'un milliard en 1987, a atteint 20 milliards de paires par année en 1996.[2] La sensibilisation au latex est le résultat de l'exposition aux protéines du latex au fil du temps et, même si les taux de sensibilisation documentés varient, il est estimé que 8 à 12 % des travailleurs de la santé ont une sensibilisation au latex. [3]

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1. Meade, B. J., Weissman, D. N., & Beezhold, D. H. (2002). Latex allergy past and present. InternationalImmunopharmacology. 2, 225 – 238.

2. Ibid.

3. U.S. Department of Labor, Occupational Safety and Health Administration. (2002, novembre) Safety and health topics: latex allergy [version électronique]. Consulté le 20 novembre 2002 à http://www.osha.gov.

LATEX ALLERGY: STILL A CHALLENGE?

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Although latex products have been in use for over a century, allergic responses to latex proteins have only been recognized as a serious health problem for about the past 15 years.[1] In 1987, when the Occupational Safety and Health Administration (OSHA) introduced Universal Precautions, the demand for examination gloves increased significantly. Since everyone who came in contact with blood or body fluids was then expected to wear hand protection, glove use increased from fewer than 1 billion pairs per year (prior to 1987) to over 20 billion pairs of gloves by 1996.[2] Latex sensitization is caused by exposure to latex proteins over time, and, although stated sensitization rates vary, it has been estimated that 8 – 12% of healthcare workers are latex sensitive.[3]

RISK GROUPS

When it comes to latex allergy certain risk groups are examined. Anyone who frequently wears latex gloves in their line of work is potentially at risk of developing this allergy. The major source of workplace exposure is natural rubber latex (NRL) gloves.[4] The groups at risk include healthcare workers, dental workers, EMS workers, as well as non-healthcare workers such as law enforcement personnel, firefighters, gardeners, and painters. Other groups that may be at risk are people who have spina bifida, those who have had multiple surgeries and those who are atopic (genetically predisposed to allergy).[5]

TYPES OF RESPONSES

The three main potential responses to the use of natural rubber latex gloves are: an irritant response (non-allergic), Type IV allergy (localized response) and Type I allergy (systemic response). Let's look at each response separately.

Irritant response, or irritant contact dermatitis, is the result of mechanical or thermal damage to the skin but is not an allergic reaction. This reaction is caused by skin irritation from using gloves and, possibly, by exposure to other workplace products and chemicals. The reaction can also result from repeated hand washing and drying, incomplete hand drying, or exposure to powders added to the gloves.[6] Chronic exposure leads to dry, thickened, and cracked

Type of Reaction	Medical Term	Cause	Symptoms
Skin Irritation *(non-allergic)*  *Courtesy Regent Medical*	Irritant or Contact Dermatitis	• Repeated washing • Insufficient rinsing • Antiseptic agents • Glove powder	**Dermatitis** • Redness • Dry, cracked skin • Itching • Hard, red bumps
Type IV Allergy *(localized response)*  *Courtesy Regent Medical*	Delayed Hypersensitivity (T-Cell lymphocytes)	• Repeated exposure to processing chemicals	**Skin Symptoms** • Puffiness • Redness • Inflammation • Peeled/cracked skin Occurs several hours after exposure Can persist for prolonged period if untreated
Type I Allergy *(systemic response)*  *Courtesy Regent Medical*	Immediate Hypersensitivity (IgE mediated)	• Repetitive exposures to naturally occurring water-soluble proteins in latex products	**Skin symptoms** • Inflammation • Redness • Itching • Urticaria **Systemic symptoms** • Watery eyes • Rhinitis • Asthma-like symptoms **Can progress to more severe reactions** • Facial swelling • Breathlessness • Anaphylaxis Can occur within minutes after exposure

skin. Management of this problem may include identifying and eliminating the irritant, using proper hand hygiene, thoroughly drying hands and changing glove types.[7]

Type IV allergy, or allergic contact dermatitis, is T-cell mediated and is a localized response. This response is an allergic reaction to chemicals that are used in the glove manufacturing process. It is a true allergic response as it involves the immune system.[8] Many individuals mistake this response for a latex allergy mainly because they have the reaction while wearing latex gloves. Some of the signs and symptoms of a Type IV reaction include but are not limited to erythema, pruritis, and edema. These symptoms can be delayed from 6 to 48 hours. It is important to understand this delay because if one wants to discontinue use of the problem glove they are currently wearing and try a new brand of glove, they should give themselves at least 48 hours without wearing gloves at all. This may allow their body to recuperate somewhat from the offending chemical before they try another brand of glove.[9]

Diagnosis for this allergy is usually a patch test using commercially available chemical reagents. Management for this allergy includes using a latex or non-latex glove without the offending chemical. Be aware that synthetic products can contain the same chemicals as those in latex products. It is important to know exactly *which glove component* one is allergic to, rather than simply assuming that latex is the allergic component.[10]

Type I Allergy, or immediate hypersensitivity, is potentially the most serious response to latex products. Between 1989 and 1997, there have been over 2,300 allergic responses to latex products and 28 deaths resulting from latex protein-induced anaphylaxis reported to the US FDA.[11] The reaction occurs when a latex-allergic individual comes in direct contact with latex proteins. Reactions usually begin within minutes of exposure. Symptoms run from mild (skin redness, hives, itching) to more severe (cough, hoarse voice, chest tightness, runny nose, itchy or swollen eyes) to life threatening (bronchospasm and shock).[12]

Diagnosis of this allergy requires a careful recording of medical history followed by serologic testing (RAST) and/or skin prick testing. Management of this allergy means that the individual has to avoid contact with latex proteins at all cost. They should use non-latex products and, ideally, should work in a powder-free environment. Starch powder is responsible for aerosolization of the latex proteins that may cause an allergic reaction in sensitized individuals.[13]

POWDER ISSUES

When natural rubber latex gloves were first introduced over 100 years ago, they were sterilized by boiling and donned over wet hands. Later on, when dry sterilization was introduced, it was necessary to use a dusting powder agent to facilitate donning. The first agents used were lycopodium powder, talcum powder or a mixture of the two. Over time, these agents were found to cause peritoneal granulomas.[14] Therefore an absorbable alternative was needed.

"In 1947, the superiority of cornstarch powder treated with epichlorhydrin over talc as a lubricant for surgical gloves was reported. This mixed with 2 percent magnesium oxide as a desiccating agent was later marketed as absorbable dusting powder (ADP) glove powder. It is this material that remains in use today".[15] When ADP was first introduced, starch peritonitis was not a problem mainly because the cornstarch was broken down during the steam sterilization process, which led to rapid absorption in the body. As gamma irradiation became the sterilization process of choice for surgical gloves, the cornstarch granule was not damaged sufficiently to lead to early absorption.[16] This lead to the formation of granulomas and adhesions in some surgical patients.[17] Aerosolization of the latex protein is a hotly discussed issue. Researchers have reported that cornstarch powder on latex gloves serves as a carrier of the latex proteins and may precipitate an allergic reaction in sensitized individuals.[18] Asthma, upper airway, and ocular symptoms are associated with the airborne latex proteins.[19]

Powder also acts as a foreign body that can elicit an inflammatory response and may interfere

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with a host's defenses against infection.[20] In addition, when cornstarch contaminates soft tissues, it can delay wound healing.[21] Starch powder can be introduced into wounds by the use of powdered gloves during surgical procedures, despite glove washing and wiping beforehand.[22] Powder also has masqueraded as peritoneal carcinomatosis.[23] For at least these reasons, the use of powder-free gloves in any environment simply makes sense. Many hospitals have already made the decision to convert to a powder-free environment and may have also saved money while increasing safety.[24 25]

LATEX-SAFE ENVIRONMENT

Due to the potential risks associated with latex allergy, and to help avoid further sensitization, healthcare facilities should take steps to create a safe place for both patients and employees.[26]

One of the first things to do is to form a multidisciplinary latex committee. This committee will be responsible for disseminating information on latex to their various departments so that everyone will be knowledgeable of latex products if questions regarding the allergy arise. Education for this committee is imperative and the group must be committed to seeing that the latex-safe environment is maintained.[27]

Latex allergy protocols, for both patients and employees, are very important. Each healthcare facility should consider writing protocols that address how to deal with latex-allergic and high-risk patients. A screening questionnaire is an important way to help identify people with the allergy or those who are at risk. Once individuals are identified by the questionnaire, it is a good idea to use a special coloured armband, signs, and other methods to clearly identify the latex-allergic patient.[28] A latex-free cart may be readily available outside the patient's room. The latex-allergic person should, ideally, be in a private room. If that is not possible, the other individual(s) in the room must be treated as if they are latex-allergic as well. If the facility does not have a latex-safe procedure or operating room the latex-allergic patient should be the first case of the day. That is when the level of aerosolized latex protein is at the lowest.[29]

Also according to Kim, employees who are latex-allergic should be closely monitored on a regular basis.[30] Using a screening questionnaire for employees could be part of their annual employee physical (***see page 22***). This would assist the Employee Health Practitioner in keeping accurate records and/or updating the progress of those employees who are either already latex-allergic or are just beginning to exhibit signs of acquiring the allergy. Education programs on latex allergy are very important for all hospital staff. The more knowledgeable the staff, the better they can care for the latex-sensitive patient. Hospitals may want to make this information part of their annual mandatory information sessions.

Many experts advise that all latex-allergic individuals should wear a Medic Alert bracelet or some other form of identification of their allergy.[31 32 33] It is also suggested that they carry some kind of self-injecting epinephrine with them at all times. Synthetic gloves should be carried on the person for use in case of an accident.

CONCLUSION

Do we have to get rid of latex gloves in order to have a latex-safe environment? According to several researchers already referenced, the use of powder-free, low-allergen latex gloves can provide an adequate latex-safe environment. A powder-free environment would be beneficial to the latex-sensitive employee and patient. It has been shown that if workers wear powder-free, low-allergen gloves, the latex aeroallergens may be reduced by more than 10-fold.[34] Because of the advances in the technology of synthetic products, some hospitals have looked at going latex-free.

Besides providing a safe environment for its employees, facilities that decide to go powder-free are able to offer the community a place where individuals can feel that their health is the number one consideration from admission through discharge.

Screening Questionnaire for Natural Rubber Latex Sensitivity

IMPORTANT CAUTION: This questionnaire is not intended to be all-inclusive. Individuals who are uncertain whether they have sensitivities or allergies to natural rubber latex proteins and/or chemicals should consult a physician.

1. Have you ever been told by a doctor that you have an allergy to any latex product?

☐ Yes ☐ No

If yes, to what specifically did the doctor say you were allergic? _____

_____

How were you diagnosed?

☐ Patch test ☐ Wear test ☐ RAST test ☐ Skin Prick test ☐ Don't know

2. Have you had a reaction to any of the following personal sources of latex?

	Yes	No		Yes	No		Yes	No
balloons	☐	☐	carpet backing	☐	☐	garden hoses	☐	☐
rubber gloves	☐	☐	clothing	☐	☐	golf grips	☐	☐
hot water bottles	☐	☐	rubber cement	☐	☐	latex cuffs	☐	☐
rubber balls	☐	☐	suspenders	☐	☐	ostomy bags	☐	☐
rubber bands	☐	☐	teething rings	☐	☐	dental masks	☐	☐
adhesive tape	☐	☐	condoms	☐	☐	pacifiers	☐	☐
ace bandages	☐	☐	elastic undergarments	☐	☐	shoewear	☐	☐
dental bite blocks	☐	☐	dental cofferdams	☐	☐	tennis grip	☐	☐
bandages	☐	☐	erasers	☐	☐	weather stripping	☐	☐
belts	☐	☐	face masks	☐	☐	IV tubing	☐	☐
brassieres	☐	☐	foam pillows	☐	☐			

3. Do you have a personal or family history of...

	Yes	No		Yes	No		Yes	No
contact dermatitis	☐	☐	hay fever	☐	☐	autoimmune disease	☐	☐
rhinitis or conjunctivitis	☐	☐	eczema	☐	☐	asthma	☐	☐

4. Do you have any drug allergies?

☐ Yes ☐ No

If yes, what drugs are you allergic to? _____

_____

5. Do you have any food allergies?

☐ Yes ☐ No

If yes, are you allergic to any of the following?

Onset:	Recent (last 12 mos.)	Long-standing		Recent (last 12 mos.)	Long-standing
banana	☐	☐	milk	☐	☐
avocado	☐	☐	peaches	☐	☐
raw potato	☐	☐	tomato	☐	☐
kiwi	☐	☐	papaya	☐	☐
chestnuts	☐	☐	passion fruit	☐	☐

	Onset: Recent (last 12 mons.)	Long-standing
other _____	☐	☐

6. After handling or wearing latex products, have you experienced:

	Yes	No		Yes	No
chapping or "cracking" of skin	☐	☐	redness	☐	☐
runny nose/congestion	☐	☐	swelling	☐	☐
itching (hands, eyes, etc.)	☐	☐	hives	☐	☐
other _____	☐	☐			

7. Have you ever had surgery?

☐ Yes ☐ No

If yes, how many surgeries have you had? _____

At what age did you have your first surgery? _____

Type(s) of surgical procedures _____

Have you ever had an allergic reaction during anesthesia? ☐ Yes ☐ No ☐ Don't know

8. Have you had extensive dental work?

☐ Yes ☐ No

Type of work completed _____

9. Do you have any congenital abnormalities (i.e., spina bifida)?

☐ Yes ☐ No

What type? _____

10. What is your occupation? _____

Does this occupation involve frequent contact with products containing latex?

☐ Yes ☐ No

If yes, which products do you come in contact with? _____

11. Have you ever had an anaphylactic reaction to latex devices?

☐ Yes ☐ No

If yes, under what circumstances did it occur? _____

_____

_____

_____

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This document is suggested for use by professional healthcare providers as a diagnostic tool.

CAUTION: Latex protein allergies are cumulative. That is, the more a person is exposed to poorly processed latex, the more likely it is that a potentially irreversible allergy will develop. While sensitization threshold levels vary by individual, it is clear that the best way for healthcare workers to avoid future reactions without sacrificing the protection and performance of latex is to wear only powder-free latex gloves with the lowest possible allergen content. However, once a latex allergy is confirmed, only non-latex, gloves should be worn.

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Latex Allergy: Still a Challenge? (cont.)

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LIFE-LONG DREAM FULFILLED

LA RÉALISATION DU RÊVE DE TOUTE UNE VIE

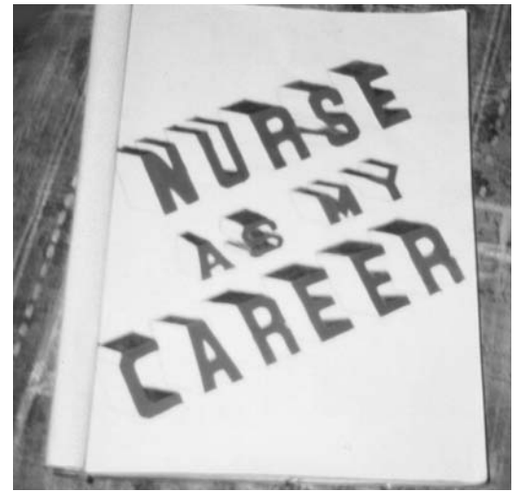
Auteure : *Gloria Stephens, après une carrière d'infirmière de 43 ans, est maintenant à la retraite à Halifax, Nouvelle-Écosse. Pendant sa carrière elle a été présidente du BCORNG de 1970 à 1972 et de l'AIISOC de 1990 à 1993. Elle a reçu le RNABC Excellence Award in Nursing Practice en 1987 et a été la toute première récipiendaire du Isabelle Adams Award en 1988.*

Au début des années 40, quand j'étais une fille de 14 ans en 9e année à la Chebucto Road School à Halifax, Nouvelle-Écosse, un conseiller d'orientation nous a enseigné un cours obligatoire nommé *CARRIÈRES*. Pour réussir le cours, il fallait élaborer un « CAHIER DE CARRIÈRE ». La page titre de mon cahier lisait « Ma carrière comme infirmière ». En fait, j'avais choisi cette carrière bien avant l'âge de quatorze.

LIFE-LONG DREAM FULFILLED

Author: *Gloria Stephens is, after a 43-year career in nursing, retired and living in Halifax, NS. Her career included acting as BCORNG President from 1970 to 1972, a term as ORNAC President (90-93), receiving the 1987 RNABC Excellence Award in Nursing Practice; and receiving the first ever Isabelle Adams Award in 1988.*

In the early 1940's, when I was a 14 year old in grade 9 at Chebucto Road School, in Halifax, NS, a Guidance Counsellor taught my class a compulsory subject titled *CAREERS*. The credit criteria for this subject required the development of a 'CAREER BOOK'. The title page for my career book was Nurse As My Career. I had actually chosen this career long before the age of fourteen.



Courtesy G. Stephens

Cover of author's grade 9 career book

Thankfully mothers often save precious momentos. After my mother's passing, in 2001, I found my career book in a trunk. For those days when we wonder why we do what we do, let me share some of the highlights exactly as they appeared in the pages of my career book:

WHY I CHOSE NURSING *– "nursing is the practical art of caring for the sick in hospitals, private homes, clinics, institutions, as well as preventing diseases. The work is interesting in all branches, varied and stimulating. The patient who has faith and trust in a nurse has a better chance of recovery than one who feels she is being cared for by a nurse for the financial part alone. I have set nursing as my goal in life and I shall work hard until I have success and achieved this goal."*

WORKING CONDITIONS *– "strain of work is severe both mentally and physically therefore it requires an effort to keep oneself healthy."*

QUALIFICATIONS *– "nursing is an occupation that has a lasting future, is honourable, profitable, and must be done to the best of one's ability, therefore requires higher education … start with a High School*

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