American Latex Allergy Association

Guidelines for the Management of Latex Allergies

Gordon Sussman, M.D. and Milton Gold, M.D.

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Disclaimer
These guidelines were developed by the authors through dialogue with and contributions from other stakeholders. These guidelines are intended as a framework to guide a health care facility in the management of safe latex medical product use. The decision to use latex or non-latex products in specific circumstances is the responsibility of individual facilities and health care professionals based on informed judgment and available scientific information.

Use of these guidelines is for information purposes only. The authors, the Canadian Healthcare Association and the American College of Allergy, Asthma & Immunology are not responsible for their application, or for facilities? decisions in the use of medical products.

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Introduction
Natural rubber latex, commonly referred to as latex, is a common component of many medical supplies used in the hospital environment. Although latex is most often associated with disposable gloves, other items which may contain latex include airways, intravenous tubing, syringes, stethoscopes, catheters, dressings and bandages.

The reporting of allergic reactions to latex has dramatically increased in the past six years. The increased numbers of latex-allergic individuals have prompted the establishment of guidelines for patient care, such as those developed by the American College of Allergy, Asthma & Immunology (?Interim Recommendations to Health Professionals & Organizations Regarding Latex Allergy Precautions,? March 1992). Frequent users of latex products may develop allergies to latex proteins, with resulting allergic reactions varying from mild to life-threatening. This document provides guidelines for management of individuals that are working with or exposed to latex in the health care facility environment. These guidelines were developed with the cooperation of several organizations and individuals in both Canada and the United States (see Appendix 1).

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Description of Latex Allergy
Background
Natural rubber latex is a processed plant product of which over 99% of the world?s supply is derived from the latex or the milky cytosol of the tree Hevea braziliensis found in Africa and Southeast Asia. Latex is produced by specialized lactifer cells and is composed of various chemicals: lipids, phospholipids and proteins. The proteins are responsible for allergic sensitization predisposing to IgE mediated reactions. There are 200 other plant species capable of producing latex, but only one other, the guayule bush, has the potential to produce enough for commercial use.

After the harvesting process, ammonia and other preservatives are immediately added to the latex to prevent degradation. Other chemicals including anti-oxidants (phenylenediamine) and accelerators (thiurams,

carbamates) are added to give the latex its desirable properties. Porcelain molds are then dipped into these latex concentrates to produce products of different shapes and sizes, such as balloons, gloves and condoms. The accelerators speed up the vulcanization or curing process in which the rubber precursors are cross-linked.

The chemical additives are responsible for some local skin reactions (for example, allergic or chemical sensitivity contact dermatitis), but are virtually never the cause of immediate generalized allergic reactions or anaphylaxis. These latter reactions are almost invariably due to immediate allergic sensitization to latex proteins themselves.

Natural rubber latex should not be confused with synthetic rubber (for example, butyl or petroleum-based). Synthetic rubber poses no hazard to latex-sensitive individuals (Jones et al., 1996).

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Reactions Caused by Latex Allergy

Contact Dermatitis

Contact dermatitis, including both irritant and allergic responses, is the most common clinical reaction associated with latex and its additives. (Heese et al., 1991).

Irritant Contact Dermatitis

Irritant contact dermatitis is a non-allergic skin rash characterized by hand erythema, dryness, cracking, scaling and vesicle formation. These changes may be due to sweating or rubbing under the glove and from residual soaps and detergents in prolonged contact with the gloved cutaneous surface (Fay, 1991).

Allergic Contact Dermatitis

Allergic contact dermatitis (ACD), or chemical sensitivity contact dermatitis, is a specific immune response of sensitized lymphocytes to chemical additives contained in latex products. This response is known as delayed hypersensitivity. Clinically at the outset, there may be an acute eczematous dermatitis on the dorsum of the hands often with vesicle formation. The lesions typically appear 48-96 hours after exposure. Subsequently, the skin may become dry, crusted and thickened. Etiologic agents involve chemical additives, such as accelerators or antioxidants. Thiurams and carbamates are commonly implicated agents, but ACD can potentially occur to any latex chemical additive (Conde-Salazar et al., 1993).

Contact dermatitis may be involved in latex sensitization. Irritant or allergic contact reactions reduce the barrier properties of the skin and allow absorption of larger amounts of chemicals or proteins. This is thought to increase the risk of latex sensitization. An increased frequency and progression through ACD may precede the onset of latex allergy (Charous et al., 1994). The use of cotton liners for protection under the gloves or the use of non-latex gloves should reduce sensitization and is recommended for individuals with irritant or ACD.

Immediate Allergic Reaction

An immediate allergic reaction (or IgE mediated hypersensitivity reaction) is caused by latex proteins which directly sensitize the patient and subsequently cause allergic symptoms, including rhinitis (Carrillo et al., 1986), conjunctivitis (ibid.), urticaria (Nutter, 1979), angioedema (Axelsson et al., 1988), asthma (Seaton et al., 1988), anaphylaxis (Axelsson et al., 1987) and death (Ownby et al., 1991).

Direct contact with the medical product is not needed for sensitization to latex. Allergenic latex proteins are also adsorbed on the glove powder which, when latex gloves are snapped on and off, become airborne and can be directly inhaled (Lagier et al., 1990). Direct latex exposure at mucosal or serosal surfaces also occurs by repeated use of rubber catheters (Meerpol et al., 1993) or gloves used intraoperatively during abdominal or urologic surgery

(Gerber et al., 1989; Gold et al., 1991).

Serious anaphylactic reactions have occurred in many different settings including vaginal deliveries (Laurent et al., 1992) and examinations (Axelsson et al., 1987); medical procedures, such as barium enema examinations (Ownby et al., 1991); dental procedures, with rubber gloves or cofferdams (Gratten and Kennedy, 1985); while donning gloves (Swanson et al., 1993); and intraoperatively, most commonly during abdominal or genitourinary surgery (Gerber et al., 1989; Gold et al., 1991).

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Risk Groups
Population at risk for developing latex allergy and the prevalence of latex sensitization in these groups are listed below.

Patient Risk Groups	**Prevalence of Latex Sensitization**
Patients with spina bifida and congenital genitourinary abnormalities	18-73% [1]
Health care workers (housekeepers, lab workers, dentists, nurses, physicians)	3-17% [2]
Rubber industry workers	11% [3]
Atopic patients (asthma, rhinitis, eczema)	6.8% [4]
Patients who have undergone multiple procedures	6.5% [5]

[1] Slater et al., 1991; Kelly et al., 1994. [2.] Sussman et al., 1995; Turjanmaa, 1987; Zoltan et al., 1992; Lagier et al., 1993; Arellano et al., 1992. [3.] Tarlo et al., 1990. [4.] Shield and Blaiss, 1992. [5.] Moneret-Vautrin et al., 1993.

In addition to these risk groups, individuals who have certain food allergies, including banana, avocado, chestnut, apricot, kiwi, papaya, passion fruit, pineapple, peach, nectarine, plum, cherry, melon, fig, grape, potato, tomato and celery, may also have a coexisting latex allergy (Kurup et al., 1994). Other implicated foods and food products include apple, pear, carrot, hazelnut, wheat, rye, mugwort, profilin, potatin, plant stress proteins and ficus. The latex sensitivity may appear before, at the same time or after the development of the food sensitivity. Questioning about latex reactivity and skin and serologic testing should be considered in this group. However, not all patients with these food allergies will require latex avoidance, and similarly, not all patients with latex allergies will have problems with these foods.

Patients with none of the above risk factors may still be allergic to latex. A recent study of 1,000 volunteer blood donors found a 6.4% prevalence of serum specific anti-latex IgE antibody (Ownby et al., 1994). A second study reported 10 out of 224 (4.5%) allergy clinic patients with a positive skin text to latex (Hadjiliadis et al., 1995). Most of these patients were symptomatic on latex exposure, but the full extent of the clinical relevance of these results in unknown. The fact that symptomatic latex allergy has been reported in the absence of known risk factors suggests that these findings may have significance for some affected individuals (Charous, 1994).

The frequency of clinical reactions to latex has not been determined for those with intermittent use of rubber

gloves, such as police officers, ambulance attendants, funeral home workers, firemen, restaurant workers, painters and gardeners.

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Reasons for the Increased Prevalence

There are several theories that explain the recent increase in prevalence of latex allergy. The most plausible is the introduction of universal precautions in an effort to prevent the spread of hepatitis B and HIV infections (Centers for Disease Control, 1987). With universal precautions, a single standard of blood and bloody body fluid precautions must be used with all patients at all times, as it is assumed that these fluids are potentially infectious. One of the main ways of complying with universal precautions is through the use of gloves. This has created a growth industry for latex glove production and has resulted in greater exposure of predisposed health care workers and patients to latex products.

Increase demand for latex gloves created changes in glove processing and manufacturing, including shorter wash and shelf times, which have increased the amount of latex protein antigens in gloves and other products (Levy et al., 1992). Despite improvements to the manufacturing process to reduce the protein allergens, high levels of extractable latex antigens are still being found in latex gloves. Recent research has indicated that not all manufacturers have lowered the allergen level (Jones et al., 1994). Low-protein latex gloves are now being evaluated for allergenicity (Yunginger et al., 1994).

Another reason for the increased prevalence relates to the greater familiarity with latex allergy and the corresponding increased recognition and reporting of it (Kelly et al., 1994). For general reviews on the origins of latex allergy, see Truscott (1995) and Charous et al. (1994a).

Latex Allergy Guidelines for Health Care Facilities and Medical Clinics

Latex Allergy Program

A facility-wide strategy to manage latex allergies in the health care environment should include the formation of latex allergy task force and the development of appropriate facility policies, awareness and educational initiatives.

Latex Allergy Task Force

A multidisciplinary latex allergy task force should be a regular part of the health care facility employee and patient care committee. The membership of this task force should include representation from the medical staff (medicine, surgery, allergy, anesthesia and radiology), nursing (operating room, ambulatory care, intensive care and general ward care), hospital administration, pharmacy, housekeeping, central supply and occupational health.

Policies

Policies should be developed to manage the latex-sensitive individual in all areas of the hospital, with particular attention to high-risk areas. Emergency and X-ray departments, operating rooms, intensive care units, nurseries and dental suites are areas of high latex usage and airborne exposure.

A mechanism for the complete and timely evaluation of all suspected latex reactions should be in place. To facilitate reporting of possible latex-allergic symptoms, educational policies should be established for all hospital staff, presurgical and high-risk areas. Education on the potential health risks related to latex sensitivity should be first targeted to areas of high glove usage.

Policies regarding occupational latex allergies should address the issues of (1) measures to be taken for latex-

related illness, (2) procedures for reallocation of severely allergic employees, (3) allowance of sick leave and workers compensation benefits, including relocation, short-term leave and long-term leave.

As the health care environment is continually changing, a regular review of latex allergy policies and procedures will be necessary.

Consultation Services
Questions regarding latex allergy should routinely be asked of presurgical patients and prospective hospital employees.

A latex consultation service should be available for evaluation of latex allergic individuals. Any possible reaction to latex devices should be immediately reported to the consultation service, which should then conduct an investigation and advise follow-up testing and consultation as appropriate.

Review of Glove Usage
As latex gloves are the most common medical product implicated in latex allergies, a facility-wide review of glove usage should be undertaken to determine the appropriateness of use (degree of risk, level of protection, compliance with universal precautions) and thereby prevent the unnecessary use of latex gloves (Sui et al., 1995). Non-powdered, low-protein gloves should be the standard in a health care facility with powdered, low-protein gloves available only on request and their use monitored.

Hospitals need to evaluate manufacturer information on non-latex gloves in areas of durability, barrier protection and cost. Substitute gloves, particularly vinyl , need assessment of barrier characteristics because some studies suggest a higher viral leakage rate than latex gloves. Until further studies are done, latex is still considered superior with respect to barrier characteristics against transmissible diseases (Korniewicz et al., 1992).

Compendium of Products
The hospital should prepare a compendium of all hospital latex products. Ideally this compendium should include information on the content of latex protein. However, at this time, only the protein content of gloves is provided by manufacturers on a voluntary basis.

Lists of non-latex substitutes for medical supplies and devices should also be accessible. **(A list has been developed by A.L.E.R.T., Inc. - Allergy to Latex Education and Resource Team, Milwaukee, Wisc.)** [1]. Since manufacturers are continuously developing non-latex alternatives, a regular review and updating of these lists is recommended.

Latex-Safe Environment
A latex-safe environment should be the goal of the health care facility. Latex-safe carts containing non-latex substitutes should be available in all patient care areas, particularly those with high latex usage.

A latex allergy quality assurance program should be established and address the following areas:

- supervising latex use in the hospital areas
- developing databases of all latex products
- developing databases of all latex substitutes
- assessment and reporting of all latex-related reactions
- supervising and maintaining latex-safe environments
- changing to low-protein, low-powder latex gloves

Identification of High Risk Patients
Patients belonging to high risk groups should be identified. The following should be carried out by a physician for all high risk patients:

- All historical data should be documented with written reports of all reactions to latex (medical, surgical or dental products; household products, such as gloves, clothing or toys). Clinical allergic responses include contact dermatitis, urticaria, angioedema, rhinitis, conjunctivitis, asthma and anaphylaxis.

- Unexplained allergic/anaphylactic reactions, intraoperative events, a history of multiple surgical procedures, reactions to latex cross-reacting foods, and the presence or past history of documented atopic disorders (asthma, rhinitis or eczema) should be studied and subsequently appropriately identified. A sample questionnaire on patient latex allergies is provided in Appendix 2.

Patient Testing

Patient testing should include sensitivities to rubber additives and allergic reactions to latex proteins.

Rubber Additives Patients with hand dermatitis and exposure to latex should be referred for consultation to determine and document sensitivities to rubber additives. Patch testing is the diagnostic method for allergen identification in allergic contact, but not irritant dermatitis. In patch testing, immunogenic rubber additive chemicals of appropriate concentration are taped on the patient?s back for 48-96 hours. Patch tests are preformed and interpreted according to standardized techniques (see Appendix 3).

All exposed patients with hand dermatitis should also be referred to an allergy specialist to determine if they possess IgE antibody to latex proteins.

Barrier creams used to relieve contact dermatitis can extract latex protein from latex gloves and may enhance skin penetration of allergens. Therefore, these creams should not be used by latex-sensitive patients (Truscott, 1995).

Latex Proteins All high-risk patients in the health care facility should be encouraged to have latex allergy testing.

Low-risk patients with a negative clinical history of known latex reactions do not require allergy testing. The skin tests and in vitro tests available do not have the specificity to evaluate such patients. These individuals should be evaluated only if they have symptoms suggestive of a latex allergy.

Skin Tests Presently, skin testing with allergen extracts is the most sensitive means of detecting IgE antibody.

Skin testing extracts to determine latex protein allergy have included commercial extracts, latex glove extracts and hevea leaves. No standardized latex extract is presently available. One extract used in Canada (Bencard Laboratories, Mississauga, Ontario) has been reported to have 93% sensitivity (Turjanmaa et al., 1994).

Glove extracts are made using a standardized method of soaking glove material in diluent. Extreme caution must be used with glove extracts because of variable allergenic protein levels and the potential for serious reactions from skin tests (Yunginger et al., 1994). Conversely, false negative skin tests may be produced by extracts of gloves with low latex allergen content.

Because of the potential for serious anaphylactic reactions, skin testing must be done by qualified specialists (Kelly et al., 1993), with full resuscitative equipment and medication available in the event of reactions to testing material (see Appendix 4).

In vitro tests In vitro tests measure the IgE response in the serum of a latex-allergic patient. Analysis of the latex proteins has concluded that there are over 240 such proteins, and anti-IgE antibody testing has shown that 25% are associated with the allergic responses (Chambeyron et al., 1992). Latex IgE-binding proteins vary in size and appear to differ between patient groups. For example, spina bifida patients have IgE antibodies to a 27 kD peptide, whereas health care workers may produce IgE antibodies to a 20 kD peptide (Slater, 1994). Research is ongoing in the characterization of these proteins with the goal of modifying or reducing the offending allergens.

In vitro testing should be done in the following circumstances: to confirm results of skin testing; when skin testing is considered too dangerous to perform; when skin testing is not available.

In vitro immunoassays are designed to measure IgE antibody in serum. Several research and clinical latex-specific IgE assay methods are currently used, including the enzyme linked immunosorbent assay (ELISA), the radioallergosorbent test (RAST) and ImmunoCAP System (Upjohn-Pharmacia, Uppsala, Sweden), and the latex AlaSTAT (Diagnostic Products Corporation, Los Angeles, Calif.). In addition, other research procedures, such as Western blot analysis, have been useful in identifying and characterizing the molecular weights of allergenic latex proteins. In early studies, the RAST displayed a 53% diagnostic sensitivity as compared to skin tests with latex extracts (Turjanmaa et al., 1988). Since then, more recent studies have shown that research assays and clinical tests, such as the AlaSTAT, have increased the sensitivity of allergic skin testing. In one study, this diagnostic sensitivity approached 96% in comparison to skin to skin testing (McCullough and Ownby, 1993). Both skin testing and in vitro assays detect the presence of a latex-specific IgE antibody in the skin and serum, respectively, and do not necessarily predict clinical presentations such as anaphylaxis (Kelly, Kurup et al., 1994). A significant association has been shown between the size of the skin test response and clinical manifestations (Hadjiliadis, 1996). Also, a negative latex-specific IgE test does not rule out a latex allergy. However, it is safest to recommend latex-avoidance precautions to protect all individuals with a positive latex skin test and/or serological test.

Prevention and Management of Latex-Allergic Individuals
All individuals identified as latex-allergic by history or testing should be counseled by a knowledgeable physician. The following precautions apply:

- A medical alert bracelet should be worn to indicate their allergy.
- An epinephrine self-injection kit such as Epi Pen (Center Laboratories, Port Washington, N.Y.) or Ana Kit (Bayer Corporation, Pharmaceutical Division, West Haven, Conn.) should be available in case of latex-allergic reactions.
- Non-latex gloves should be carried by all latex-allergic individuals, as presently, latex substitutes may not be available at all health care facilities
- There is a risk of increasing allergic reactions if exposure to high levels of latex allergens continues

Guidelines for the Use of Latex and Non-Latex Products
General health care facility environment

Powder-free, low-protein gloves or non-latex gloves should be used throughout the health care facility to reduce exposure to airborne latex particles. The use of high-protein, powdered gloves should be discouraged. Hospitals need to evaluate all non-latex gloves for their durability, barrier protection, and cost.

A health care facility should provide a latex-safe environment as follows:
Latex-allergic patients Latex-safe environments should be provided for latex allergic patients needing medical, surgical or dental procedures. Latex-safe areas are defined as those containing only non-latex materials. This includes gloves, catheters, IV equipment, surgical tape, tourniquets, ventilation and airway equipment and medication containers without latex stoppers. As this is an evolving field, the allergenic risks of individual medical products are still being identified.

Latex-free material should be readily available to health care workers. Emergency carts with latex-free medical products should be available on the hospital wards, especially the emergency suites.

Dietary personnel should use non-latex gloves when preparing food for latex-allergic patients. It has been reported that latex-allergic patients have reacted to latex-contaminated foods handled by cafeteria staff wearing latex gloves (Schwartz, 1995).

Latex-allergic workers Latex-allergic workers should use only non-latex gloves and other products, and avoid all latex-containing products. Other persons in the same work environment should use powder-free, low-protein gloves or preferably, non-latex gloves.

Patient Guidelines
Efforts should be made to avoid latex exposure from birth in all children with spina bifida or other medical conditions which require early and repeated operation intervention or instrumentation, particularly if this involves the genitourinary system. In particular:

- Spina bifida patients have a higher sensitization rate and prevalence of latex allergy (18 - 73%, Table 1) with a higher risk of anaphylaxis during surgical procedures (Slater, 1989). It is believed that this is due to extensive latex exposure in early life.

- Reports of successful operations in latex-allergic spina bifida patients where the patients have been exposed to latex are misleading. Kelly, Pearson et al. (1994) found that latex- sensitive patients may experience anaphylaxis once every 13.6 exposures. Avoidance from birth is recommended to prevent sensitization and subsequent allergic reactions.

All spina bifida patients and all latex-allergic patients should receive detailed explanation and counseling about their allergy and safe alternative products, including the need for careful latex- avoidance procedures during medical, surgical and dental procedures (Sussman and Beezhold, 1995).

All hospitalized latex-allergic patients should have proper identification of their latex allergy on armbands, hospital charts, beds and room entrances.

Latex allergic patients should be admitted to latex-safe rooms. Latex products should not be used on other patients in these rooms.

All hospital personnel entering a latex-safe environment, whether or not they are in direct contact with latex-allergic patients, should only wear non-latex gloves. Hospital personnel who have used latex products prior to attending to the latex-sensitive patients should wash and gown before entering the patient?s room to reduce potential exposure to residual latex powder.

Surgery of latex-allergic patients should be done in operating room suites that are latex safe. Ideally, the OR suites would also be monitored for airborne latex allergens (Swanson et al., 1993), as the patient should not have any direct or indirect contact with latex.

Procedures on latex-allergic patients carried out in the recovery room, intensive care unit, radiology suites, emergency departments, dental suites and other treatment areas require similar latex-avoidance precautions. If latex-safe rooms are not available, elective patients should be booked as the first case of the morning in order to minimize exposure to airborne latex.

If a patient has a history of a previous latex anaphylactic event, premedication with antihistamines and corticosteroids may be used in an attempt to minimize the consequences of inadvertent latex exposure. The physician may choose to premedicate latex allergic spina bifida patients no matter how minor their previous clinical reactions. However, premedication by itself has never been validated scientifically and must not be considered a substitute for latex avoidance (Langouet-Astrie et al., 1993).

Occupational Latex Allergy Guidelines

The responsibility for hospital-related latex illness should be assumed by the facility-based employee health units, occupational staff nurses and physicians. Representatives from these units should be part of hospital committees developed to manage latex-related hospital policies.

Questionnaires should be administered to all new employees to determine the risk or presence of latex-related problems.

Employees should be educated to recognize the signs and symptoms of possible latex allergy and encouraged to report the development of these symptoms.

All high-risk employees should have latex allergy testing. High-risk employees are those who use gloves regularly, have existing allergies, particularly to food, or have hand dermatitis or eczema.

Low-risk employees with a negative clinical history of latex reactions do not need allergy testing, but should be evaluated if symptoms suggestive of latex sensitivity develop during their employment.

Latex-allergic individuals with positive histories and skin tests should be counseled on the risk of continued work in environments with high latex use and advised to use only non-latex gloves and to avoid all latex-containing products. They should have proper allergic identification and always carry an epinephrine auto-injector device.

Persons with irritant or ACD should use cotton liners for protection under latex gloves or non-latex gloves.

Avoidance Issues

It is highly unlikely that all patient exposures to latex in a health care facility can be eliminated for the following reasons:

- It should be recognized that it is impossible to make an operating room completely latex free. The goal should be a latex-safe environment for allergic individuals through the use of non-latex products, and in the case of non-allergic individuals, through the use of low-protein, powder-free gloves.

- The exact latex-avoidance measures necessary to prevent IgE-dependent allergic- sensitization reactions are not clearly established. There have been rare case reports of systemic reactions from IV tubing after needle punctures of the rubber ports presumably due to latex allergy (Schwartz and Zurowski, 1993). However, another study found latex-allergenic proteins in a multi-dose vial only after 40 punctures of the rubber stopper (Yunginger et al., 1993). Natural rubber latex must be differentiated from butyl rubber, which is used in rubber stoppers, and from synthetic rubber in latex paints, neither of which poses hazards to patients sensitized to latex (Yunginger, 1995).

As many as 40,000 consumer products may contain latex. At present, there is no requirement to label rubber products with their latex protein content. No standards exist for the measurement and reporting of latex protein and other substances, making comparison between products difficult. Legislation is needed to change this deficiency of inadequate labeling of sterile and non-sterile gloves and include a quantitative measure of glove protein antigen level.

In the United States, the Food and Drug Administration (FDA), published proposed mandatory labeling of latex rubber in medical devices in the June 24, 1996, Federal Register. The proposed regulations also would disallow use of the misleading term ?hypoallergenic? on labels for medical devices that contain latex. These proposals are contained in the formal position paper issued by the American College of Allergy, Asthma & Immunology (Charous et al., 1995). The College also petitioned the FDA for latex content labeling of consumer goods and establishing maximum levels of extractable latex allergen levels in gloves.

Presently, the hypoallergenic labeling on gloves commonly refers to a reduction of rubber- additive chemical responsible for contact dermatitis. A clear definition and quantitative value for latex chemical additives and supporting test results should be encouraged by health care professionals. Hypoallergenic gloves often contain latex proteins which are responsible for severe life-threatening IgE-dependent allergic reactions. Manufacturers should remove the hypoallergenic label from products and relabel with all product components. Legislation is needed to clarify this issue by directing the manufacturer to provide information on the protein content, chemical-additive content and powder content of gloves.

The hazards of starch powder in aersolizing latex allergens needs to be adequately addressed by both manufacturers and government. Latex gloves have been shown to be the major contributors to latex aeroallergens in hospital operating room environments (Heilman et al., 1996). Appropriate substitutes which do not disperse latex allergens and sensitize patients should be developed. At present, powder-free gloves appear to be adequate in preventing dispersion of allergens.

High-risk patients need to be informed that hospitals can be made latex safe, but not totally latex free. The risk of a reaction still persists. This can be controlled by an increased awareness among health care facility staff, the use

of safe latex substitutes and the appropriate use of prophylactic medications where indicated

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Appendix I: Contributors

Principle Authors

Gordon L. Sussman, M.D. FRCPC; FACP; President, Canadian Society of Allergy and Clinical Immunology; Assistant Professor, University of Toronto; Head, Section of Allergy, Division of Immunology, The Wellesley Hospital, Toronto, Ontario.

Milton Gold, M.D. FRCPC; Assistant Professor of Pediatrics, University of Toronto; Division of Immunology and Allergy, The Hospital for Sick Children, Toronto, Ontario.

Contibutors

Emil Bardana, MD Oregon Health Science University, Portland, Oregon