

## Latex Allergy Management Guidelines

### Overview

#### Definition of Latex Allergy

In recent years, natural rubber latex (NRL or latex) allergy has been recognized as a significant problem for both patients and healthcare employees.<sup>1</sup> Latex allergy is an IgE-mediated (immunologic) reaction to the proteins present in NRL that come from the milky fluid of the Brazilian rubber tree, *Hevea Brasiliensis*.<sup>2</sup> Many medical or dental supplies and devices, such as latex gloves, syringes, and catheters, are manufactured from NRL, and can trigger allergies in some individuals. Such allergic reactions typically manifest in the form of redness or itching and can progress to more severe symptoms, such as asthma and anaphylaxis.<sup>2,3</sup> Although there is no cure for latex allergy, prompt diagnosis and management can significantly minimize the risk of this serious reaction.<sup>2</sup>

#### Groups at Risk for Latex Allergy

While the general population has a low incidence of latex allergy, ranging from 1.0% to 6.7%, certain groups remain at high risk. These groups include **healthcare workers** who frequently wear latex gloves (8-16%) and **children with spina bifida, spinal cord trauma, and urogenital malformations** who may have had repeated exposure to latex products because of multiple surgeries (24-64%).<sup>4</sup> Other groups at risk for latex allergy include:

- Workers with occupational exposure to latex (e.g., hairdressers, latex glove manufacturers or housekeeping personnel).<sup>5</sup>
- Patients with a history of asthma, dermatitis or eczema.<sup>5</sup>
- Patients exposed to repeated bladder catheterization as a result of spinal cord trauma or neurogenic bladder.<sup>1</sup>
- Patients with food allergy, especially to bananas, avocados, kiwi, or chestnuts.<sup>1,6</sup>
- Patients with a history of anaphylaxis of uncertain etiology, especially during past surgeries, hospitalization or dental visits.<sup>1,7</sup>
- Patients with a history of multiple surgeries or medical procedures during childhood.<sup>6</sup>
- Female patients facing greater exposure to latex-containing products due to obstetric procedures, gynecological examinations, and contact with contraceptives.<sup>8</sup>

#### Routes of Exposure and Reactions to Latex

Latex allergy usually occurs when latex-containing products (especially **powdered gloves**) come in direct contact with the skin, mucous membranes (eyes, mouth, vagina, and rectum), or the bloodstream. The powder in gloves can absorb latex proteins and then become an airborne carrier. Individuals may develop allergic reactions through merely inhaling latex-containing dust.<sup>1,9</sup> Latex allergy symptoms can range from mild (e.g., redness) to severe (e.g., anaphylaxis) and are typically classified into three major types:<sup>1,10</sup>

- **Immediate hypersensitivity (type I)** - This is an IgE-mediated (immune) response that typically has an immediate reaction (within 5-30 minutes of initial contact). Symptoms can include urticarial, asthma, rhinitis, conjunctivitis, orbit edema, angioedema, lip edema, and anaphylaxis.

- **Delayed hypersensitivity (type IV)** - This is an immune reaction that takes place several hours after initial contact (within 6-48 hours). Common symptoms include erythema, swelling, cracking, itching, weeping, and dryness of the skin.
- **Irritant contact dermatitis** - This is a non-allergic reaction, typically occurring in frequent glove users. The reaction may appear within minutes to hours of glove contact. Symptoms may include redness, chapping, chafing, drying, and scaling and cracking. This condition may not be necessarily attributable to contact with latex, as other products (e.g., household cleaning supplies) may also be responsible for this type of skin reaction.

## Management

### Latex Allergy Management Initiative

Management of latex allergy requires identifying the problem and taking appropriate actions to protect both patients and healthcare workers. Healthcare settings should consider forming a multidisciplinary committee consisting of representatives from the medical staff, clinical staff, and ancillary departments. The committee should be responsible for developing **policies**, **procedures** and **consultation services** related to managing latex allergies. The focus of the initiative should be concentrated in four main areas:<sup>4</sup>

- Identifying and protecting patients at risk;
- Determining whether certain employees are at higher risk;
- Accommodating employees with allergies; and
- Educating and raising awareness among patients and employees.

All gloves used by staff in the facility need to be evaluated for effectiveness (i.e., appropriate barrier protection). Given that latex gloves are the main source of allergies, high-quality non-powdered, low protein gloves should be used as standard across all healthcare settings.<sup>9,11-13</sup>

### Latex-Safe Environment

A latex-safe environment should be provided and appropriately managed in all healthcare facilities. Many facilities in the United States are now latex-safe. However, maintaining a latex-safe environment is not always easy as it involves considerable resources in terms of time and money. Leadership, organizational readiness for change, and continued education are equally important in creating and maintaining a latex-safe environment.<sup>12</sup>

Areas designated as latex-safe need to be closely supervised to ensure availability of latex-safe carts with non-latex medical products in all patient care areas.<sup>13</sup>

The facility should develop, maintain, and regularly update a database system that contains all latex products, their substitutes and documents cases with latex-related reactions.<sup>13</sup> Updated lists of non-latex products are available on the following websites: the Spina Bifida Association of America ([www.sbaa.org](http://www.sbaa.org)) and American Latex Allergy Association (<http://latexallergyresources.org/medical-products>).

Healthcare professionals working or volunteering in developing countries need to be aware that facilities may not be latex-safe.

## Managing High Risk Patients

Successful management of high risk patients (immediate hypersensitivity, type I) involves early diagnosis and emergency treatment.

### 1. *Pre-operative Assessment*

All patients should be assessed for latex allergy before anesthesia. Detailed patient history is obtained to identify patients at risk, including:<sup>1,14</sup>

- Patient history of latex allergy.
- Occupation/employment history.
- The presence of symptoms, such as itchy, swollen eyes, runny nose, and sneezing. Some people may develop asthma (symptoms may include chest tightness, wheezing, coughing and shortness of breath) after contact with latex-containing products (e.g., allergic reaction after blowing a balloon).
- Any history of fruit allergy.
- Spina bifida and multiple surgical procedures during childhood.

If any of the above symptoms are present, patients should be treated as if they are allergic to latex.

### 2. *Pre-operative Diagnostic Testing*

A health care provider should advise his/her patient with suspected latex allergy to undergo further testing. It is especially important to rule out IgE-mediated sensitivity. In the United States, there are three different FDA-approved serum tests to detect and quantify latex-specific IgEs: CAP, ALaSTAT and HYTEC. While these tests are highly specific, their sensitivity is rather low (range 75% - 90%). Skin prick testing, on the other hand, has a high specificity (more than 90%),<sup>1,3</sup> however, this type of diagnostic technique may induce anaphylactic reaction in some patients and therefore, should be carried out only by trained healthcare professionals.<sup>15</sup>

### 3. *Perioperative Precautions*

A patient with confirmed type I allergy should be advised by his/her healthcare provider to follow immediate precautions, including:

- Be monitored by an allergist.
- Wear latex allergy medical alert bracelet.
- Keep an epinephrine auto-injection kit.

### 4. *Preparing the Operating Room*

Facilities that are not latex-safe should prepare the operating room the night before in order to avoid the release of latex particles. Patients should receive scheduling priority in the morning. The anesthesia professionals involved in the case should be informed that the patient has a latex allergy. The patient's latex allergy also needs to be documented in case notes.<sup>3</sup>

5. *Treating Patients in the Operating Room*

All items containing latex must be removed from the patient care area. Only non-latex medical supplies should be used including, but not limited to:<sup>13</sup>

- Gloves
- Catheters
- IV equipment
- Surgical tape
- Tourniquets
- Ventilation and airway equipment
- Medication containers without latex stoppers.

Preoperative prophylaxis of latex allergy patients with antihistamines and corticosteroids has been recommended in the past but many are moving away from this practice.<sup>16</sup> The rationale for not using pretreatment is that it may lessen an early immune response. This may result in anaphylaxis being the first sign of an allergic reaction.<sup>17</sup>

*Other considerations*

- It is unlikely that a type I hypersensitivity reaction will occur in a patient with latex allergy due to exposure to the latex contained in a syringe plunger.<sup>18</sup>
- Rubber vial stoppers should be punctured once. This is the usual practice of hospital pharmacists to minimize the risk of exposing the patient to latex from this potential source. The use of stopcocks can eliminate the need to inject medications via intravenous tubing latex ports.<sup>19</sup>

**Important: Use caution when selecting non-latex gloves. Not all substitutes can equally protect against bloodborne pathogens. Care and investigation should be taken in the selection of substitute gloves.**<sup>20</sup>

6. *Recognizing Anaphylaxis during the Perioperative Period*

Some patients may develop anaphylaxis 30 to 60 minutes after being exposed to latex (via absorption of airborne allergens or with mucous membrane exposure) during surgery. This is a serious allergic reaction involving severe difficulty in breathing and/or a sudden drop in blood pressure.<sup>5</sup> Anaphylaxis often presents a diagnostic challenge during anesthesia and surgery because the symptoms may resemble other medical conditions, such as extensive sympathetic blockade. Also, anaphylaxis may be missed in patients who are draped during surgery. Incorrect diagnosis and delayed treatment of anaphylaxis can cause severe health consequences and even death.<sup>8</sup> Bronchospasm and cardiovascular collapse are often the first signs of an anaphylactic reaction.<sup>5</sup> Other symptoms are summarized in Table 1 below:<sup>1</sup>

**Table 1.** Symptoms of anaphylaxis.

Awake Patients	Anesthetized Patients
<ul style="list-style-type: none"> <li>• Itchy eyes</li> <li>• Generalized pruritus</li> <li>• Shortness of breath</li> <li>• Sneezing</li> <li>• Wheezing</li> <li>• Nausea and/or vomiting</li> <li>• Faintness</li> <li>• Abdominal cramping</li> <li>• Diarrhea</li> <li>• Feeling of impending doom</li> </ul>	<ul style="list-style-type: none"> <li>• Facial edema</li> <li>• Hives (urticaria)</li> <li>• Rash</li> <li>• Skin flushing</li> <li>• Bronchospasm</li> <li>• Laryngeal edema</li> <li>• Edema</li> <li>• Hypotension</li> <li>• Tachycardia</li> <li>• Cardiac arrest</li> </ul>

Once anaphylaxis is recognized, aggressive treatment should follow immediately. Treatment usually involves the following steps:<sup>5,21</sup>

- Discontinue all latex-containing products suspected of causing reaction.
- Maintain airway and administer 100% oxygen.
- Discontinue anesthetic drugs if the event occurs during induction.
- Start treatment with epinephrine as soon as possible.
- Maintain fluid balance.
- Administer where appropriate H1- and H2-receptor blockers, which can help alleviate some symptoms.
- Use a corticosteroid to help prevent or control the late-phase reaction (which can occur up to 36 hours later).

### Managing Healthcare Workers

Healthcare workers with latex allergies may acquire a long-term disability resulting in significant individual and social costs related to health care, insurance and workers' compensation claims.<sup>11,22</sup> Some healthcare workers may not want to disclose their symptoms/condition to their employer, which may worsen their reaction to latex-containing products over time.<sup>22</sup> Given these consequences, it is important to have preventive measures in place to protect all healthcare workers against latex allergies.

#### 1. *Reasonable Accommodations for Employees who are Diagnosed with Latex Allergy*

Healthcare facilities should take precautions to reduce latex exposure among their employees.<sup>15</sup>

- Encourage employees to report any symptoms to their immediate supervisor.
- Advise healthcare workers with latex allergy on treatment options.

Healthcare workers with confirmed latex allergy should follow these steps to help reduce symptoms and future exposure:<sup>13,15,23,24</sup>

- Use non-latex gloves only.
- Avoid areas where powdered latex gloves or other latex products are used and dispensed.
- Avoid contact with latex products.
- Wear a latex alert medical bracelet.

- Seek treatment for allergy.
- If possible, request to be transferred to a latex safe environment or 'safe zones' defined as areas in which non-latex products are used and latex proteins have been removed from the environment.

## 2. *General Recommendations Regarding Glove Use Among Healthcare Workers*

In general, healthcare workers should follow precautions to protect themselves at work. If latex gloves need to be worn for barrier protection when handling hazardous materials, healthcare workers should opt for low-protein, powder-free gloves.<sup>20,24</sup> In their study Korniewicz and colleagues were able to demonstrate that although the initial cost of conversion to powder-free, low-protein latex surgical gloves may be high, it can help reduce long-term healthcare costs.<sup>11</sup> Healthcare workers should also take special care of their hands by reducing the amount of time gloves are worn, washing hands with PH balanced soap, and avoiding oil-based hand creams and lotions that can disintegrate gloves. Special care should be exercised when putting on or removing gloves (especially avoiding letting the gloves snap), as latex proteins can be diffused into the air. Using glove liners and wearing double and triple gloves can also help reduce exposure to latex.<sup>15,20</sup>

## Continuing Education

Continuing education of patients, their families, healthcare workers, and employers is an important part of management of latex allergy. Patients who are diagnosed with latex allergy and their family members should be educated about how to manage this condition and follow preventive measures to avoid future exposure.<sup>3</sup>

Healthcare workers should receive education and training on how to recognize the signs and symptoms of an allergic reaction in patients, prevent latex exposure, and treat allergic and anaphylactic response. Healthcare workers should also be encouraged to seek guidance from their employer if they experience latex allergy symptoms.<sup>3</sup>

Finally, facilities need to establish policies and procedures to ensure that the setting is safe for patients and health care workers.<sup>4</sup>

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