

# Care of the Latex-Hypersensitive Patient in Surgery

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**I**n recent years, growing concern has surrounded the care of latex-hypersensitive patients in surgery. The incidence of latex hypersensitivity in patients is increasing daily; health care professionals must be prepared to recognize the signs and symptoms indicative of this disorder, and to face the challenge of caring for such high-risk patients in surgery. Operating room personnel must ensure that the safest possible surgical environment is provided to these patients. First, a historical perspective of latex hypersensitivity is presented.

## History

Latex is the milky sap derived from the rubber tree (*Hevea brasiliensis*). This sap is used to produce surgical gloves and a variety of other products through complicated processes.<sup>1-4</sup>

The British first discovered natural latex in the mid-18th century, and its use became widespread by the mid-1900s. The first incident of an allergic reaction to latex was recorded in medical literature in 1979: a British housewife suffered a hypersensitive reaction to her household cleaning gloves. European medical journals reported approximately 50 such cases between 1979 and 1988. In the fall of 1989, the FDA received reports of anaphylactic shock occurring during radiologic exams, and in 1990 and early 1991, nine surgical patients at Milwaukee Children's Hospital were reported to have suffered hypersensitive reactions during the administration of anesthesia prior to surgery. A common denominator existed in all nine cases: the presence of anesthesia equipment and intravenous catheters containing latex. Fortunately, none of these allergic reactions was fatal because appropriate emergency techniques were employed.<sup>1,2</sup>

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In 1986, nearly 1.4 billion gloves

were used in the provision of medical care; in 1988, 2 billion were used. When health care providers began to implement the universal precautions regulations relating to the bloodborne pathogens standard issued by the Occupational Safety and Health Administration (OSHA) in December 1991, the increased demand for latex gloves by the medical community resulted in the use of more than 8 billion surgical/exam gloves.<sup>1,6-8</sup>

Studies conducted when the OSHA universal precautions were first undertaken in health care institutions revealed that only 2.4% of health care workers were at risk of allergic reaction to latex. Some workers were placed at greater risk because of the frequency of exposure to latex. Operating room personnel were placed at a 5.6% risk of reaction, whereas the risk to surgeons was 7.2%. More recently, the risk to all health care workers of developing hypersensitivity rose to between 10% and 17%, and those reacting to latex exposure were found to have latex-specific immunoglobulin E (IgE) antibodies in their sera or had developed wheal-and-flare reactivity when subjected to skin testing. Experts estimate that health care professionals currently face a 20% risk of affliction with latex hypersensitivity.<sup>1,6</sup>

The emergence of latex hypersensitivity as a life-threatening disability can be attributed to several factors. Glove producers rushed to meet the demand for gloves that were needed in order to comply with the safety precautions mandated. Unfortunately, many "shortcuts" were taken: quality measures in the manufacturing process were slackened, resulting in "dirty" gloves reaching the market. The prospect of a glove shortage caused some suppliers to solicit manufacturers of inferior gloves to fill the void. Flawed processing in the production of these gloves contributed to the incidence of latex sensitization in

users. Gloves containing high levels of latex proteins were introduced on the market and continue to be used today. Latex proteins have been implicated in allergic reactions, and the cornstarch powder used to ease the donning of latex gloves exacerbates user sensitization because of the powder's effect on the aerosolization (producing a mist) of the latex proteins. Therefore, an individual can become sensitized to latex without coming into direct contact with a latex product.<sup>1,6</sup>

## Identifying High-Risk Groups

One of the first steps in minimizing the dangers of latex hypersensitivity within the health care environment is to recognize members of patient groups considered to be at high risk for developing this disorder, such as those with spina bifida; health care personnel; rubber manufacturing workers; patients with a history of multiple surgeries; those diagnosed with atopy (an allergy toward which a patient is genetically predisposed); or those requiring chronic or repeated catheterization of the bladder.<sup>1,3,5,9</sup>

Children and adults afflicted with spina bifida comprise the highest-risk group. Spina bifida is a congenital defect of the vertebral laminae, affecting primarily the lumbar region of the spine. These patients—already highly atopic—become sensitized because of extensive exposure to latex when undergoing multiple surgeries and catheterizations, and through repeated contact with medical personnel who wear latex gloves.<sup>1,3-7,9-11,13</sup>

Health care workers experience the second-highest incidence of latex hypersensitivity. Statistics recorded in 1994 indicate that surgeons were at a 7.5% risk of developing an allergy to latex, while operating room personnel had a 5.6% risk. Dentists had a 13.7% risk and hospital personnel other than nurses

and physicians were placed at 1.3% risk. The general public faced a risk of less than 1%.<sup>1</sup>

### Patient Screening

Diagnosis of the latex-hypersensitive patient is begun in a thorough history-taking that may reveal a pattern of allergic reaction to foods; elicit a history of atopic allergy or the occurrence of anaphylaxis during surgery or upon contact with latex; or confirm the existence of any other symptoms indicating that the patient may be at risk. Detailed questioning of patients upon admission to the hospital, particularly of those undergoing surgical or radiological procedures, is a crucial preventive measure. The importance of health care practitioners' becoming familiar with and being able to recognize symptoms related to latex hypersensitivity can not be overemphasized. The nature of these symptoms may range from a minor inconvenience to a major, life-threatening occurrence. The reaction may occur immediately or be delayed for several hours. Following are the most common symptoms demonstrated in an allergic reaction to latex; their degree of severity may vary from patient to patient:

**Oral.** Itching in the palate or pharynx; excessive production of mucus; hypopharyngeal edema causing difficulty in swallowing.

**Ocular.** Itching, excessive production of tears, and edema of the eyelids or conjunctiva.

**Nasal.** Sneezing, itching followed by watery rhinorrhea, and congestion.

**Laryngeal.** Hoarseness, loss of voice, and cough.

**Pulmonary.** Symptoms ranging from mild cough to life-threatening asthma; bronchospasm, congestion, or sensation of tightness in the chest.

**Mental.** Dizziness, anxiety.

**Gastrointestinal.** Nausea, vomiting, abdominal pain, and diarrhea.

**Integumentary.** Localized swelling, urticaria, and contact dermatitis.

**Cardiac.** Tachycardia, palpitations.

**Anaphylaxis.** The most severe of all symptoms, this life-threatening event involves marked respiratory difficulty, hypotension, and shock, accompanied by any or all of the symptoms named above.<sup>1,3,10,12</sup>

In the early 1990s, European researchers reported the discovery of a link between food allergies and latex

hypersensitivity. Clinical research suggests that nearly 50% of all patients allergic to natural rubber latex may also exhibit allergic reaction to certain foods, such as bananas, avocado, chestnuts, kiwi, passion fruit, apricots, pineapple, peaches, cherries and grapes. In the past, health care providers failed to acknowledge the value of identifying certain food allergies as relating to a potentially concomitant hypersensitivity to latex.<sup>1</sup>

The standard allergy tests—the skin-prick, intradermal, and serological tests—are being evaluated by experts for their effectiveness in diagnosis. While skin testing is considered to be the most accurate means of diagnosis available, others believe that it is both unsafe and unreliable. More sophisticated diagnostic tools are under development; one of these is a latex extract for which FDA approval is anticipated. At

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present, researchers in the United States and Europe are focusing on new blood analysis techniques that are safer for those patients undergoing testing who may be at risk of life-threatening anaphylaxis posed by the standard serological tests: the newer techniques do not expose such patients to latex serum. Currently, no antidote for latex hypersensitivity exists.<sup>1,2,5,6,11</sup>

### Latex-Precautionary Task Force

Hospitals are advised to assemble a latex-precautionary task force whose mission it is to address the need for proper protocols applicable to the care of latex-hypersensitive patients and to the protection of health care workers. Specific procedures that anticipate the admission of latex-allergic patients must be established. Following is the recommended composition of this task force; the multidisciplinary personnel and their respective functions within the task force are included.

- Physician from the allergy/immunology department staff (coordinates the task force; instigates allergy treatment protocols and safety measures)

- Surgeon (serves as physician liaison and promotes implementation of precautionary protocols in the operating room)

- Internist (serves as physician liaison and promotes hospital-wide awareness of and procedures for addressing latex hypersensitivity)

- Surgical technologist (aids in procedural implementation; identifies latex-bearing products and their nonlatex alternatives for use in the operating room)

- Operating room nurse (coordinates implementation of related procedures in the operating room)

- Personnel representing ambulatory surgery, inpatient floors, intensive care, emergency room, and labor and delivery room (develop policies and procedures relating to latex-hypersensitivity precautions and implements them in the respective departments; aids in the education of coworkers)

- Respiratory care personnel (coordinate safe respiratory care of the hypersensitive patient and ensure that coworkers are informed of protocols)

- Personnel representing materials management, central supply, and sterile processing departments (research, update, and maintain a list of latex products and their alternatives; maintain latex-free kits)

- Occupational health personnel (recognize latex-allergic employees and assist in improving their work environment; inform employees of precautionary measures relating to latex hypersensitivity).<sup>1,7</sup>

Development of latex-precautionary guidelines is necessary in all health care institutions in order to provide the safest possible environment for at-risk patients and employees. Although adherence to these guidelines serves to reduce the degree of risk to such persons, the fact that latex is ubiquitous (currently, it is found in more than 40,000 products) renders virtually impossible a total avoidance of exposure. Sensitized patients preparing to undergo surgery or anesthesia must be warned that the latex allergen can never be completely eradicated; the risk of a reaction to latex still exists in spite of the

most stringent measures implemented to control its presence.<sup>17</sup>

The following five-part policy and procedures outline relating to latex-specific precautions and applicable to the surgical department is provided as an example only; the actual implementation of such guidelines requires that they be designed according to the needs of the individual facility.<sup>17</sup>

#### **Policy and Procedure: Operating Room Latex Precautions for the Care of the Latex-Hypersensitive Patient**

##### *I. Policy Statement*

To identify those patients at risk for latex hypersensitivity and to assure them of a safe (and if possible, latex-free) operating room environment.

##### *II. General Guidelines*

- A. Exposure to latex may cause an allergic reaction either locally (ie, itching, urticaria) or systemically (ie, anaphylaxis, IgE-mediated hypersensitivity).
- B. Patients known to have extensive exposure to latex are at a higher risk of acquiring latex hypersensitivity. Spina bifida patients must receive treatment in an environment absolutely devoid of latex contamination, regardless of whether they are symptomatic. Health care providers, rubber manufacturing workers, and patients with a history of undergoing multiple surgical or invasive procedures should be considered at high risk. Patients with atopy or food allergies also are considered at risk.

##### *III. Equipment*

A latex precautions kit/cart and alternative, nonlatex surgical supplies necessary for the procedure are made readily available. A three-person task force comprised of a surgical technologist, an OR nurse and an OR purchasing specialist can be assigned the responsibility of researching and devising a list of equipment and supplies (delineating latex-bearing OR products and their nonlatex counterparts) for use in their particular health care facility.

##### *IV. Implementation*

- A. Patient Assessment. During history-taking, all patients are assessed for risk of latex hypersensitivity for the purpose of identifying those patients who are members of high-risk groups.

- B. Documentation. The presence of latex hypersensitivity or risk thereof shall be clearly documented on the front of the patient's chart.
- C. Communication. The fact of a patient's latex-allergic status or qualification as a member of one of the high-risk groups should be reported immediately to the patient's physician, surgeons, and attending anesthesiologist so that preanesthesia prophylaxis can be initiated if necessary.
- D. Latex Allergy Sign. A latex allergy sign will be posted on the operating room door. Products containing latex shall be removed prior to housekeeping. No latex products are allowed to be stored in or carried into the operating suite.
- E. Latex Supplies and Alternative Product List. A list of the most frequently used latex supplies and their nonlatex counterparts shall be posted in the operating room. In addition to the standard list used hospital-wide, the operating room maintains and updates a separate list of all latex-containing products and their alternatives, which is posted at all times.
- F. Operating Room Latex Precautions Kit. In addition to the standard hospital latex precautions kit obtained from central supply, operating room personnel ensure that an "operating room latex precautions kit" is assembled, containing the following items: surgical masks; nonlatex surgical gloves (one box each in various sizes); nonlatex pneumatic tourniquet cuffs; dressings; and nonlatex shoe covers. Among the nonlatex items to be included in the standard hospital kit are latex allergy room signs; latex allergy wrist band; intravenous (IV) supplies (IV tubing [blood tubing without portals], non-latex IV tourniquet, stopcocks, and Tegaderm [do not use tape]); latex-free blood pressure cuffs; nonsterile vinyl gloves (one box each in medium and large sizes); masks; goggles (glasses with protective side shields, but without usual elastic straps); stethoscope with plastic tubing; nonsterile gowns; bottle opener; nonlatex tourniquet; nonlatex ambulatory resuscitation ("Ambu") bag; and a list of latex medical/surgical products and their nonlatex alternatives.

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##### *V. Precautionary Procedures*

Once the operating room staff has been apprised of a surgical patient's suspected or confirmed latex hypersensitivity, the operating room is inspected to ensure that it is as latex-free as possible: all latex-containing supplies have been removed and housekeeping has been performed. A latex precautions kit/cart is requisitioned from central supply, an operating room precautions kit is obtained, and a latex allergy sign is posted on the door of the surgical suite. Operating room personnel ensure that all necessary nonlatex surgical and anesthesia supplies are available and ready for use. A list of latex supplies and their nonlatex alternatives is posted in the operating room. A latex allergy wrist band is placed on the patient and a latex allergy sticker is applied to the front of the patient's chart when the patient is admitted to the surgical suite. Personnel representing all of the departments involved in the patient's care are notified of the patient's latex-allergic status as soon as possible. All traffic entering and exiting the operating room during the procedure is closely monitored to prevent the possible introduction of latex-bearing products. Preferably, the latex-hypersensitive patient is scheduled to be the first surgical case of the day. If the surgical procedure being performed is an emergency, operating room personnel must be cognizant of the fact that natural rubber latex proteins become aerosolized on glove powder; therefore, anyone entering the room is required to have showered, donned clean, laundered scrubs, and adhered to proper hand-washing technique.

##### **Additional Precautions**

The effectiveness of premedication care plans for latex-hypersensitive patients

preparing to undergo surgical or radiological procedures is unproven; however, guidelines pertaining to this protocol are published in the professional journal of the American Association of Nurse Anesthetists and in *Immunology & Allergy Clinics of North America*.<sup>13</sup>

Patients and health care providers need to be educated about latex hypersensitivity and its attendant risks and to continue to stay up to date on preventive, diagnostic, and treatment measures being developed. Of greatest concern to latex-allergic patients is avoidance of latex in their daily lives. Since latex is ubiquitous in both the medical and home environments, the latex-hypersensitive individual must, for his or her own safety, remain constantly vigilant of the potential for latex contamination in one's surroundings or suffer the consequences of increasing severity of symptoms. Latex may be omnipresent, but it can elude identification in the environment. Hypersensitive patients are advised to wear Medic-Alert bracelets at all times and to carry with them a letter describing their allergic condition and specifying precautions to be taken in the event that they require emergency treatment. If prescribed by a physician, an epinephrine "Epi-Pen" must be carried by the latex-allergic individual at all times for use in treating an anaphylactic reaction. Being aware of and avoiding exposure to latex whenever possible is the only measure currently available in the management of this disease.<sup>1,5-7</sup>

The FDA is contemplating banning the use of the term "hypoallergenic" by manufacturers of medical gloves; if so, the phrase "low allergen content" may instead be used to describe such gloves. On March 18, 1993, the FDA announced that regulations for labeling of latex-bearing medical products would soon be published in the Federal Register; however, to date this has not occurred. A comprehensive system for the labeling of such products is necessary for the safety of latex-sensitive individuals, not only in the health care arena, but in the domestic and commercial environments as well. Until such a program is initiated, the identification of products containing latex will continue to be difficult.

One recommendation for medical personnel is to avoid use of any product in which the latex content is unknown. Many products may be latex-free, but are packaged in latex-bearing wrappers.

In order to ascertain whether a product contains latex, contact its manufacturer and request in writing a full description of the product's composition as well as that of its packaging. Health care practitioners must continue to pursue such product information because manufacturers may at any time alter processing steps or the ingredients used.<sup>1,2,6,11,13</sup>

### Summary

Ever cognizant of the need to establish and uphold high standards in patient care, surgical technologists must remain knowledgeable of the means by which allergic reactions (such as those exacerbated by the use of latex products in surgical suites) currently are prevented, diagnosed, and treated. □

### Glossary

**Allergen (antigen):** A protein or carbohydrate (such as a toxin, enzyme, etc.), found in and on many substances, that when introduced into the body stimulates the production of antibodies. Allergen and antigen are used interchangeably.

**Anaphylactic shock:** A severe and sometimes fatal systemic (bodily) reaction to a sensitizing substance (allergen).

**Angioedema:** An acute, painless swelling of the skin, fat, or submucosa of the face, neck, lips, larynx, hands, feet, genitalia, or viscera.

**Asthma:** A condition of the respiratory system in which a narrowing of the airways occurs, resulting in wheezing, coughing, and shortness of breath or difficulty in breathing.

**Atopic (Atopy):** Pertaining to the hereditary tendency to develop Type 1 allergic reactions.

**Conjunctivitis:** Inflammation of the conjunctiva, the mucous membrane lining the eyelids and eyeball.

**Hypersensitivity:** An abnormal condition characterized by an excessive reaction to a particular stimulus.

**IgE (immunoglobulin E):** An antibody produced during hypersensitivity reactions.

**Natural latex:** The milky sap (in its original form prior to processing) that is derived from the rubber tree.

**Natural rubber latex:** Refers to products made directly from the water-based natural latex emulsion.

**Dry rubber latex:** Refers to products made from processed, dried, or milled sheets of rubber latex.

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### References

1. Fink JN. Latex allergy. *Immunol Allergy Clin North Am*. 1995;14:39.
2. FDA Consumer. Available from <http://www.safersex.org/s/latex.allergies.html>; Internet; accessed 3 November 1993.
3. Infection Environmental Control Task Force of the AANA. Latex allergy protocol. *J Am Assoc Nurs Anesthet*. 1993; 61:223-224.
4. Hamann CP. Natural rubber latex protein sensitivity in review. *Am J Contact Dermat*. 1993;4:4-21.
5. American College of Allergy and Immunology Task Force on Latex Hypersensitivity. *Interim Recommendations to Health Professionals and Organizations Regarding Latex Allergy Precautions*. March 1992. Palatine, Ill: American College of Allergy and Immunology.
6. Manning J. The latex menace. *Milwaukee Journal Sentinel*. March 18, 1996;1G-2G. Health Edition.
7. Young MA, Meyers M, McCulloch LD, et al. Latex allergy: A guideline for perioperative nursing. *AORN J*. 1992;55:488-506.
8. Occupational Exposure to Bloodborne Pathogens (29 CFR 1910.1030). *Federal Register*. December 6, 1991;56:64003-64182.
9. Eghrari-Sabet JS, Slater JE. Latex allergy: A potentially serious respiratory disorder. *J Respir Diseases*. 1993;14:473-476, 479-482.
10. Hitchens JT. Latex gloves: Friend or Foe? *J Am Assoc Nurs Anesthet*. 1993;61:223-224.
11. White Paper: *Latex Allergy*. Franklin Lakes, NJ: Becton Dickinson & Co; 1993.
12. Sherman SE. Precautions reduce risk of latex reactions. *OR Manager*. 1993;9:17-20.
13. Correspondent Letter. Rockville, Md: Food and Drug Administration; March 18, 1993.