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Creating a latex-perioperative environment

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As more patients and healthcare providers become sensitized to latex, the need for precautions grows.

Latex awareness and education are crucial for patients and perioperative staff. Healthcare facilities should establish a multidisciplinary team to prepare the environment to care for latex-sensitive and latex-allergic patients and healthcare workers, and develop protocols to create a latex-safe environment.[1]

Because of the close containment of supplies and abundance of products that may contain latex, dealing with latex-sensitized patients or healthcare providers is challenging. Latex may be present in packaging, even if the product itself doesn't contain latex. In the surgical setting, the greatest source of latex aeroallergens is latex gloves (both sterile and unsterile). The use of low-allergen, powder-free gloves reduces airborne latex allergen sources to below detectable levels, lowering occupational exposure, especially in ORs and invasive procedure rooms, where glove use is high.[2]

The demand for and use of latex gloves increased dramatically, from 800 million to more than 20 billion per year after the CDC's recommendation for universal precautions in 1987. Experts don't know if the increase in allergic reactions to natural rubber latex is a direct result of increased glove use or a result of abnormally high levels of residual latex antigen in gloves as a result of manufacturing issues. One in 50 healthcare workers becomes sensitized to latex each year through exposure to latex gloves.[3]

According to the Occupational Health and Safety Administration (OSHA), the use of powder-free gloves has been shown to reduce the dissemination of latex proteins into the environment, decreasing the likelihood of reactions via the inhalation and dermal routes.[4] The use of low-protein, powder-free gloves is associated with a significant decrease in Type I allergic reactions to latex among healthcare providers.[5]

The skin prick test is the gold standard to determine Type I latex hypersensitivity.

About latex

Latex is a natural product from the milky sap of the rubber tree. Repeated exposure to latex increases patients' and healthcare providers' potential for latex sensitization, an immunologic reaction in response to exposure to an antigen. A latex allergy causes the body to develop IgE antibodies in response to the antigen (the latex proteins).[6] Over time, repeated exposure may trigger an IgE-mediated allergic reaction that may be fatal if not treated promptly.

Before establishing a plan of care specific for the latex-sensitive patient, gather data about the patient populations at the greatest risk for latex sensitization.

The American Society of Anesthesiologists has identified five high-risk groups:

- Patients with a history of multiple surgical procedures. For example, 30% to 70% of patients with spina bifida have latex allergy.
- Healthcare personnel with occupational exposure. About 70% of adverse reactions to latex reported by the FDA involve healthcare providers.
- Other patients with occupational exposure to natural rubber latex.
- Patients with a history of atopy, hay fever, rhinitis, asthma, or eczema.
- Patients with a history of food allergy to tropical fruits.[6]

Types of reactions

A patient can be exposed to latex through contact with the skin or mucous membranes, by inhalation or ingestion, and by parenteral injections or wound inoculation.[6]

The three types of reactions to latex are:

- **Irritant contact dermatitis,** a nonallergic irritation that can result from frequent hand washing, insufficient rinsing, aggressive scrub technique, use of hand antiseptics, seasonal irritation, glove use, and glove powder. Symptoms include cracking of the skin, scaling, and drying. The risk for developing a latex allergy may increase if latex gloves are worn when symptoms of contact dermatitis are present. During glove use, sweating, mechanical friction from ill-fitting gloves, glove powder, and chemical glove additives may provoke and exacerbate irritant reactions, which may mimic latex glove allergies.[7,8]

Once the reaction is identified, management involves avoiding the irritant, possible use of a cotton glove liner, and use of an alternative product. For example, nonlatex gloves can be used for activities that aren't likely to involve infectious materials. Avoid oil-based hand creams, which can cause latex gloves to deteriorate, and wash your hands with mild soap and dry thoroughly after removing latex gloves.[2]

- **Type IV hypersensitivity,** also called delayed cutaneous hypersensitivity and allergic contact dermatitis, is a T cell-mediated reaction to exposure to chemicals used in the harvesting or manufacturing of latex. Symptoms include redness of the skin, raised rash, blistering, crusting, and horizontal cracks that may extend up the forearm. The reaction may occur after a sensitization period resulting from repeated exposure to latex or irritant chemical. Symptoms usually resolve spontaneously, especially when contact with the chemicals is eliminated.[8]

Once the offending chemical is identified, the person should consider using an alternative product that doesn't contain the chemical additive, and possibly a glove liner.[6]

- **Type I hypersensitivity,** also called latex allergy or immediate reaction hypersensitivity, is an immunoglobulin-mediated reaction to latex proteins (see *Type I and Type IV hypersensitivity reactions*). The

proteins can be on the glove surface, or bound to glove powder and released with glove removal, which results in latex protein suspension in the air. The latex proteins settle on objects or are transferred by touch.[8] Localized reactions involve skin redness, urticaria, or itching on the skin under the glove. Severe generalized reactions include facial swelling, rhinitis, eye symptoms, scratchy throat, respiratory distress, bronchospasm, and, in rare cases, anaphylaxis.[8]

Read all product packaging and question latex content.

Once the patient is identified as having a latex allergy, management includes avoiding latex-containing products; having coworkers use nonlatex or powder-free, low-protein gloves; and following an anaphylaxis protocol in cases of an acute allergic reaction with anaphylaxis.[6]

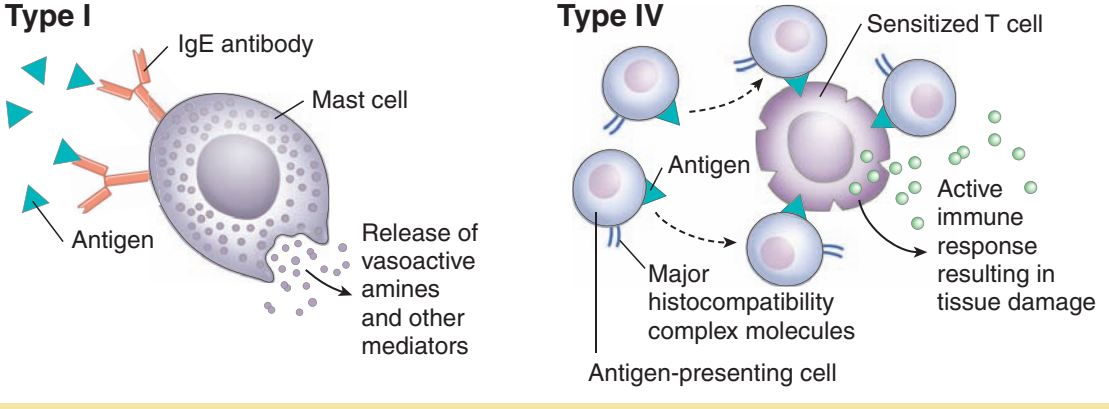
Keeping everyone safe

Perioperative nurses should question patients about potential latex sensitivity, and customize intraoperative nursing care plans to meet patient needs. A preoperative questionnaire can help in the initial assessment phase of screening latex-sensitive patients (see *A latex screening tool*). Treat patients in a manner that minimizes the risk of an allergic reaction—a latex-safe environment should be mandatory for latex-sensitized patients.[9] Several studies have shown that healthcare providers have been able to continue working in healthcare settings when low-protein, powder-free gloves are used.[5]

Preoperative testing for latex sensitization may include a skin prick test. This test, using antigens extracted from various glove products, is the current gold standard to determine Type I latex hypersensitivity. The test has a sensitivity and specificity close to 100%.[6] The radioallergosorbent test, a blood test that detects allergen-specific IgE, may be useful in confirming allergy to inhaled allergens.[10] Differentiating between hypersensitivities and latex reactions can help clinicians determine treatment protocols.

The American College of Allergy, Asthma, and Immunology has developed guidelines for healthcare facilities dealing with latex-sensitive patients and staff (see *Latex allergy guidelines for healthcare facilities*). Facilities should have a policy available for reference and guidance whenever a patient states that he or she has a latex allergy or sensitivity.

Type I and Type IV hypersensitivity reactions



Source: Smeltzer SC, Bare BG, Hinkle JL, Cheever KH. *Brunner & Suddarth's Textbook of Medical-Surgical Nursing.* 12th ed. Philadelphia, PA: Wolters Kluwer/ Lippincott Williams & Wilkins; 2010:1610.

Coordinate the following actions:

- Communicate the patient's latex sensitivity to all unit staff, the receiving unit when transferring the patient, and transport staff.
- Post a sign that latex precautions are in effect.
- Inspect the room for any latex products and remove them before the patient arrives.
- Use latex-free supplies (provide a latex-safe cart).
- Provide only synthetic (nonlatex) gloves for use.
- If the patient is in a semiprivate room (for nursing units), follow latex precautions for both patients.
- When a latex-allergic patient is scheduled for surgery, document the allergy on the OR schedule. If possible the patient should be scheduled for the first case of the day.
- Because medical products containing latex will most likely be in every hospital's inventory, staff must read product packaging and question latex content.[11]

Assemble a latex-safe cart that keeps supplies inventoried for easy access.

Formulating a policy

If a facility doesn't have a policy for latex sensitivity and allergy, a multidisciplinary team can be formed, including representatives from medical, nursing, administration, pharmacy, occupational health, central supply, dietary services, and housekeeping.[6] The team should address how to:

- identify patients and caregivers at risk for latex sensitivity

A latex screening tool

Exposure history (answer yes or no)

- Are you a healthcare worker?
- Do you wear latex gloves regularly, or are you otherwise exposed regularly to latex?
- Do your coworkers wear latex gloves regularly?
- Do you have a history of eczema or other rashes on your hands?
- Do you have a medical history of frequent surgeries or invasive medical procedures? If yes, did these procedures take place when you were an infant?
- Do you have a history of hay fever or other common allergies?
- Do you take a beta-blocker?
- Do any of the following foods cause hives, itching of the lips or throat, or more severe symptoms when you handle or eat them? Apple, apricot, avocado, banana, carrot, celery, cherry, chestnut, fig, grape, hazelnut, kiwi, melon, nectarine, papaya, passion fruit, peach, pear, pineapple, plum, potato, tomato.

Contact dermatitis assessment for patients who frequently wear latex gloves (answer yes or no)

- Does your skin develop a rash, itching, cracking, chapping, scaling, or weeping from latex glove use?
- Have these symptoms recently changed or worsened?
- Have you used different types of latex gloves? If so, have your symptoms persisted?
- Have you used nonlatex gloves? If so, have you had the same or similar symptoms as with latex gloves?
- Do these symptoms persist when you stop wearing all gloves?

History of reactions suggestive of latex allergy (answer yes or no)

- Do you have a history of anaphylaxis or intraoperative shock?
- Have you had itching, swelling, or other symptoms following dental, rectal, or pelvic exams?
- Have you experienced swelling or difficulty breathing after blowing up a balloon?
- Do condoms, diaphragms, or latex sexual aids cause itching or swelling?
- Do rubber handles, rubber bands, or elastic bands on clothing cause any discomfort?

Adapted with permission from Sussman G, Gold M. Guidelines for the management of latex allergies and safe latex use in healthcare facilities. http://www.acaai.org/public/physicians/latex.htm.

Latex allergy guidelines for healthcare facilities

Latex allergy program
A facility-wide strategy to manage latex allergies in the healthcare environment should include the formation of a 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 healthcare facility employee and patient-care committee.

Latex policies
Policies should be developed to manage the latex-sensitive individual in all areas of the hospital, with particular focus in high-risk areas: emergency and X-ray departments, ORs, ICUs, nurseries, and dental suites.

Latex consultation services
Questions about latex allergy should routinely be asked of presurgical patients as well as prospective hospital employees. A latex consultation service should be available for evaluation of latex-allergic individuals.

Reviewing glove use
A facility-wide review of glove use should be completed to prevent the unnecessary use of latex gloves. Nonpowdered, low-protein gloves should be available only on request and their use monitored. Facilities should evaluate manufacturer information on nonlatex gloves in areas of durability, barrier protection, and cost.

Latex product list
Facilities should prepare and regularly review and update a list of all latex products. Ideally this list should include information on the content of latex protein. Lists of nonlatex substitutes for medical supplies and devices should also be accessible.

Latex-safe environment
A latex-safe environment should be the goal of all healthcare facilities. Latex-safe carts containing nonlatex substitutes should be available in all patient-care areas, particularly those with high latex use. Surgical or invasive procedures on latex-allergic patients should be performed in suites that are latex-safe; the suites should also be monitored for airborne latex allergens, as the patient shouldn't have any direct or indirect contact with latex. If latex-safe rooms aren't available, elective patients should be scheduled 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 adverse consequences of inadvertent latex exposure; however, premedication must not be considered a substitute for latex avoidance.

Identifying high-risk patients
Patients at high risk should be identified and a healthcare provider should document:
- all historical data with written reports of all reactions to any latex exposure (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, conjunctivitis, asthma, and anaphylaxis).

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. All exposed patients with hand dermatitis should also be referred to an allergy specialist to determine if they possess IgE antibody to latex proteins.
- *Latex proteins.* All high-risk patients in the healthcare facility should be encouraged to have latex allergy testing.

Managing latex-allergic patients
Anyone identified as latex-allergic by history or testing should be counseled by a knowledgeable healthcare provider and take the following precautions:
- Wear a medical-alert bracelet to indicate their allergy.
- Carry an epinephrine autoinjector pen in case of a latex-allergic reaction.
- Carry nonlatex gloves because latex substitutes may not be available at all healthcare facilities.

Adapted with permission from Sussman G, Gold M. Guidelines for the management of latex allergies and safe latex use in healthcare facilities. http://www.acaai.org/public/physicians/latex.htm.

• create treatment protocols for patients with latex sensitivity
• identify the latex-containing products used in patient care
• identify acceptable alternatives to known latex-containing products
• educate hospital and medical staff members about latex sensitivity and latex allergy
• create a mechanism to identify the latex content of new products.

OSHA recommends that the team should address:
• the use of low-protein, powder-free gloves as an alternative to powdered latex gloves. (OSHA recommends not using powdered latex gloves.) Low-protein, powder-free gloves also should be used around employees with latex-induced asthma or rhinitis.
• having employees with latex allergy or sensitivity use nonlatex gloves.
• having employees with latex allergy or sensitivity take latex avoidance measures.[4]

The multidisciplinary team also must outline evaluation measures for the facility's latex-safe policies and practices. For example, the team should develop:
• a process to evaluate all glove selection and use
• a mechanism for reporting and evaluating all suspected latex reactions
• policies and protocols for managing latex-sensitive patients and healthcare providers
• educational programs for all hospital employees.[6]

Continually updating policies and practices will optimize performance improvement measures.

Assembling a latex-safe cart

In addition to designating a latex-safe room, healthcare facilities should have latex-safe carts that keep supplies inventoried for easy access. Centralizing the products also decreases traffic flow in and out of the OR during the surgical procedure. Commonly used products can be discussed by the OR team members, so that the cart's supplies can be customized to unit demand.

Because latex-free products are increasingly available, the number of products on a latex-safe cart has decreased dramatically. Some of the items that might be found on a latex-safe cart for the OR are:
• latex-free gloves in assorted sizes from 5½ to 8½
• silicone indwelling urinary catheters in all sizes
• urimeter
• cloth stockinette
• latex-free surgical drains (such as silicone Penrose drains) in ¼-, ½-, and 1-inch sizes.

Schedule latex-sensitive patients as the first procedure of the day.

Scheduling latex-sensitive patients as the first procedures of the day and preparing the OR according to the latex protocol helps reduce latex in the environment. Notify the OR of a potential latex allergy as soon as possible (preferably 24 hours in advance); identify patient risk factors for latex allergy and inform the healthcare team of these findings; and schedule the procedure as the first case of the day if the facility isn't latex-safe.[8] Allocating one OR on a daily basis for latex-sensitive patients also can help with scheduling.

Treating a latex reaction

Signs and symptoms of latex reactions vary based on the patient's exposure, and successful treatment depends in part on the severity of symptoms.

The perioperative nurse must be prepared to assist the anesthesia provider in managing a latex-induced hypersensitivity reaction. The entire perioperative team must be aware of the possibility of a hypersensitivity reaction and the steps to intervene. A severe acute reaction to latex should be treated as any other case of anaphylaxis.

The initial steps include:
• stopping the procedure and removing all sources of latex in the immediate vicinity
• irrigating the area with copious amounts of water
• securing the patient's airway, resuscitating the patient as necessary, and stabilizing cardiovascular function
• administering drugs for resuscitation and treatment of anaphylaxis (typically epinephrine, diphenhydramine, ranitidine, dopamine, and glucocorticoids, as prescribed and indicated)

• changing gloves and instruments, once the patient is stabilized, and completing the surgery, avoiding all latex products.[12]

By formulating a latex policy, using latex-free products, educating staff, and screening patients, facilities can improve safety for patients and healthcare providers with latex sensitivities. **OR**

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