



Natural rubber latex is used in many manufactured goods such as tires, balloons, condoms, catheters, rubber dams, vaccine injection portals, and medical and surgical gloves. In the healthcare setting, the strength, durability, and flexibility of latex contribute to satisfying a glove wearer's needs for comfort, ease of use, and barrier protection from infectious agents. The increase in demand for medical gloves has been accompanied by reports of latex sensitivity, prompting efforts to understand and reduce its incidence.

Latex sensitivity reactions can involve either allergic or nonallergic reactions. Because of the variety and complexity of response to different offending agents, classification of the different sensitivity reactions, irritant versus allergic, has been difficult and confusing, especially in emergencies, when time-consuming allergy testing is not practical. For practical purposes, three reactions relevant to latex sensitivity are discussed here: the nonimmunologic Irritant Contact Dermatitis, and the two immunologic hypersensitivities: Type IV delayed hypersensitivity, and Type I immediate hypersensitivity.

Irritant Contact Dermatitis

Irritant contact dermatitis is a reaction that is not caused by an immune response, but by cell damage that leads to inflammation¹. The reaction is localized to the area of direct contact, and it is reversed by removing the offending irritant.

Type IV Delayed Hypersensitivity

Type IV delayed hypersensitivity, also known as Allergic Contact Dermatitis, usually involves an immune response to a chemical, rather than to protein. It can spread over a wider area than just the site of contact, and it is considered delayed in onset because symptoms can appear several hours after contact. Symptoms do not appear unless an individual has been sensitized to the chemical first. Type IV delayed hypersensitivity is considered to have two phases: sensitization and elicitation².

Sensitization can occur when an allergen is first detected by the immune system. The sensitizing chemical is detected by Langerhans' cells, which migrate to regional

lymph nodes and cause the production of specialized T cells that recognize the chemical allergen. These specialized T cells can then migrate to the peripheral tissues, including the skin, where they are ready to function during subsequent exposure.

If a sensitized individual is exposed to the allergen again, the increased number of effector cells in the local area recognize it, and send out signals triggering an allergic response. An excematous reaction develops, reaching a maximum between 18 and 48 hours after chemical exposure. Although this elicitation involves an immune response, it is not IgE antibody mediated, thus distinguishing it from Type I immediate hypersensitivity.

Type I Immediate Hypersensitivity

Type I immediate hypersensitivity usually involves an immune response to the proteins in natural rubber latex. If an individual becomes Type I sensitized, subsequent exposure can cause an immediate reaction, with symptoms ranging from urticaria (itching) to hives, swelling of tissues, wheezing, difficulty breathing, nausea, and, in rare instances, anaphylactic shock. This reaction involves mast cells with IgE receptors on their cell surfaces, which, when triggered, release histamine and other chemical mediators that correlate with the onset of allergic symptoms.

Distinguishing between the nonimmune irritant contact dermatitis and the two immune-related hypersensitivities, both Type IV and Type I, is important for treatment and avoidance of re-exposure. For irritant contact dermatitis, gloves with reduced levels of chemical residues should be used. These gloves should also help reduce the incidence of Type IV reactions. For Type I hypersensitivity, measures should be taken to address both sensitization and reaction. To reduce the potential for sensitization in susceptible individuals, gloves that are low in protein should be used. Glove wearers that are already Type I sensitized to latex should switch to a glove made of synthetic latex or a non-latex material. Consultation with an appropriate allergist and/or dermatologist is recommended.

- 1 van der Valk, PGM, and Maibach, HI, eds., The Irritant Contact Dermatitis Syndrome. New York: CRC Press, 1996, pp. 55-56.
- 2 Vos, JG, et al, eds., Allergic Hypersensitivities Induced by Chemicals. New York: CRC Press, 1996, pp. 186-198.
- 3 Gonzalez, E, Hospital Practice, Feb 15, 1992, pp. 137-151.

Note: All standards referenced should be reviewed for the latest active revision level.

