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**CHEMICAL
ALLERGIES AND
MEDICAL GLOVES**

CLINICAL BULLETIN

WHAT ARE CHEMICAL ALLERGIES?



Today, preventing transmissible infections in the healthcare setting is more important than ever. The appropriate selection and use of personal protective equipment (PPE) are key components in all infection prevention strategies. In this regard, medical gloves are the most common type of PPE used to protect healthcare workers (HCWs) from occupational exposure to blood or other potentially infectious materials.¹ As the use of gloves by HCWs continues to increase, so do concerns related to glove reactions.

Most allergy management programs concentrate on the understanding and treatment of latex allergy. However, other types of skin reactions to medical gloves occur and are the source of misinterpretation. One of these reactions is defined as allergic contact dermatitis (ACD), a Type IV delayed hypersensitivity caused by the various chemicals used in the manufacture of both latex and non-latex medical gloves. Chemical allergies are responsible for thirty-three percent (33%) of glove-related reactions from the total HCWs' population.² In addition, ACD may play a role in latex sensitization, since it reduces the barrier properties of the skin and thus allows absorption of larger amounts of chemicals or proteins; that may increase the risk of latex sensitization.³ An increased frequency and progression through occupational contact dermatitis may precede the onset of latex allergy.⁴ Therefore, it is important to recognize chemical allergies and treat these allergies accordingly.

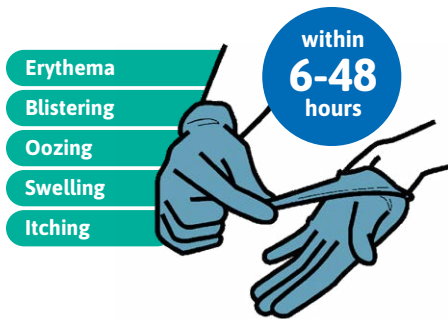
CAUSES OF CHEMICAL ALLERGIES



Chemical allergies to glove products are associated with chemical compounds used in the glove manufacturing process. In particular, chemical accelerators cause most of the reported glove-associated allergic contact dermatitis.⁵ Chemical accelerators are compounds added during the manufacturing process to accelerate the bonding process and stabilize the glove for long term storage. Importantly for the wearer, they give gloves elasticity and tensile strength. There are four main classes of chemical accelerators that induce the majority of ACD reactions:

1. Thiurams: Short-chain such as Tetramethyl thiuram disulphide (TMTD) and Tetraethylthiuram disulfide (TETD) are the most frequent glove accelerators causing Type IV hypersensitivity⁵
2. Dithiocarbamates/Carbamates
3. Mercaptobenzothiazoles (MBTs)
4. Diphenylguanidine (DPG)

DIAGNOSIS



The signs and symptoms of allergic contact dermatitis usually appear within **6 to 48 hours** after the chemical involved penetrates the skin.⁶ The healthcare worker may experience **erythema, blistering, oozing, swelling, and itching at the site of contact**. Dry, cracked, scaly skin may develop, and the rash may extend beyond the site of contact if the condition is chronic.

In the event of persistent dermatitis, consult with a knowledgeable medical practitioner in the diagnosis of skin disorders. Diagnosis is confirmed by a medical examination, a complete medical history review and Patch Testing.

MINIMIZING RISK FACTORS FOR ALLERGIC CONTACT DERMATITIS

A common factor contributing to the development of allergic contact dermatitis is a pre-existing skin condition, such as irritant contact dermatitis (ICD), which affects up to 79% of HCWs in reported dermatitis patch-tested cases.⁷ A range of factors contribute to the development of ICD, such as frequent hand washing, irritant exposure, and inadequate moisturizing.⁷

Strategies that healthcare personnel can implement to help reduce the risk of ICD and ACD caused by glove use may include:⁸

- Patch-testing to identify the susceptible chemical allergens
- Minimizing or eliminating contact with the causative chemical
- Selecting gloves manufactured without the causative agent or accelerator (Note: Chemical accelerators vary and are manufacturer dependent)
- Instituting a regular skin care regimen to keep hands healthy since healthy skin is the first line of defense against infection

! Avoidance

When a specialist confirms that a specific accelerator causes dermatitis, avoid contact with that chemical. Glove selection should include either a latex or synthetic material that does not contain the chemical accelerator involved.

Minimizing ACD Risk with Glove Selection

In response to the increasing risk of allergic contact dermatitis from medical glove use, innovative manufacturers have developed accelerator-free gloves, which are recommended to be worn by already sensitized and allergic individuals.

More recently, gloves that contain biologically safer chemical accelerators have been developed. By avoiding accelerators known to cause allergy, the risk of developing a new sensitization is reduced, and allergy will be avoided.

By understanding the clinical implications of chemical allergies related to glove use, healthcare providers can select and use glove products that promote the highest degree of safety and efficacy.

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CB.03.24

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