

Biogel®

Clinical Summary

A Chemical Battlefield: Contact Dermatitis in the Surgical Suite

Skin, the body's largest organ, provides a protective barrier that shields the body from extreme temperatures, damaging sunlight, harmful chemicals, and infectious organisms.^{1,2} Inflammation of the skin due to physical and/or chemical exposures, known as contact dermatitis, can disrupt the skin's defensive properties. While contact dermatitis can be caused by a plethora of sources, cases that are caused or made worse by workplace exposures are called occupational contact dermatitis (OCD).^{3,4} Occupational skin diseases, mostly contact dermatitis, are the 2nd highest occupational disease after musculoskeletal disorders.^{5,6}

Surgical Nurses at Highest Risk for Both Types of Occupational Contact Dermatitis

Health care workers (HCWs) are among those at highest risk due to working conditions and the extensive use of gloves.⁷ **Nurses are at highest risks with a prevalence of 18-30%.**^{4,8,9}

According to a survey of 510 nurses and surgeons, more than 30% have experienced skin irritation in the last 6 months. 51% of the surveyed clinicians indicated that were not professionally diagnosed by the occupational health team.¹⁰ Only an estimated 10-15% of occupational contact dermatitis cases are properly reported as many workers may not associate the disease with their workplace, while others may fear the association and thus choose to ignore.^{11,12,13}

Not only can contact dermatitis require medical attention at an estimated treatment cost of **\$3,552 per dermatitis claim**,¹⁴ but HCWs are at higher risk for contracting infections and transmitting infections to patients.^{15,16} The social and quality of life impact is also significant with 50% of dermatitis patients reporting inference with daily life activities. According to one study, 74% of HCWs with occupational contact dermatitis changed jobs and 29% were stopped from working.¹⁷

30%

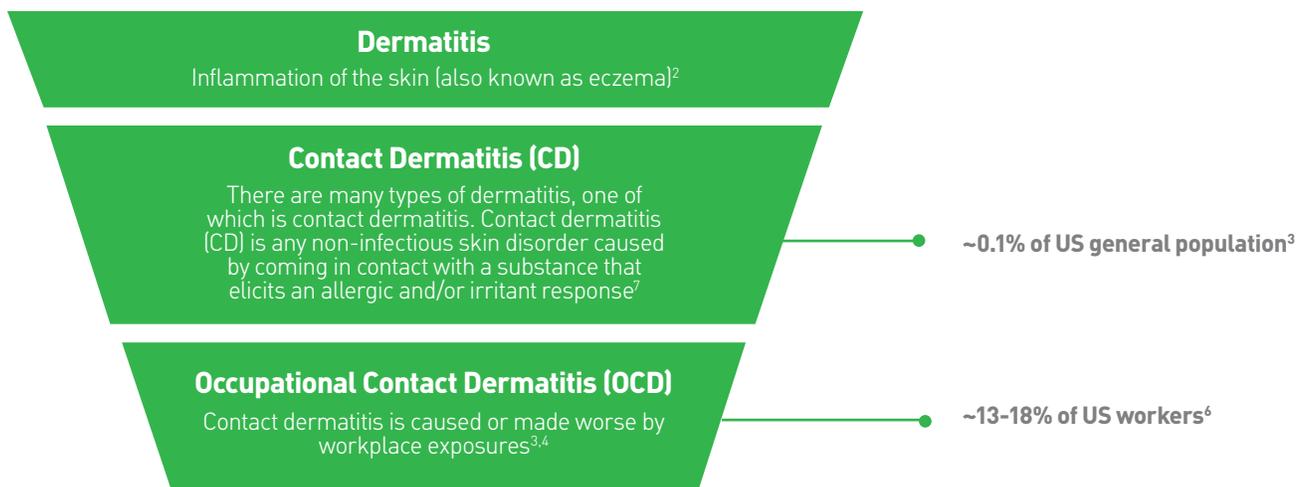
of clinicians surveyed have experienced skin irritations in the last 6 months¹⁰

51%

of clinicians surveyed who experienced skin irritation did not seek professional diagnosis¹⁰

74%

of HCWs with occupational contact dermatitis changed jobs¹⁷



Types of Occupational Contact Dermatitis*

Irritant Contact Dermatitis (ICD), the most common type of dermatitis, is not a true allergy but rather caused by mechanical or thermal insult to the skin.^{18,19} Usually the symptoms occur gradually over time and present as scaling, dryness, or cracking of skin.^{15,20}

Allergic contact dermatitis (ACD), also known as Type IV hypersensitivity, is an allergic response caused by the skin's absorption of a chemical.¹⁵ ACD is different than Type I allergy in that it does not cause an immediate, immune response or an anaphylactic reaction. Signs and symptoms of ACD include a red, raised, and palpable area with bumps, sores, and/or cracks that appear within 6-48 hours after exposure.^{21,22} ICD can potentiate the development of ACD, allowing easier penetration of chemicals due to cracking/damage to the skin.^{16,23}

**Irritant and allergic contact dermatitis can occur simultaneously, often making it difficult to diagnose.²⁴*

Surgical Gloves Are the Main Culprit

Surgical gloves, both latex and synthetic, can cause both irritant and allergic reactions.^{25,26}

Glove-Associated Irritants¹⁹

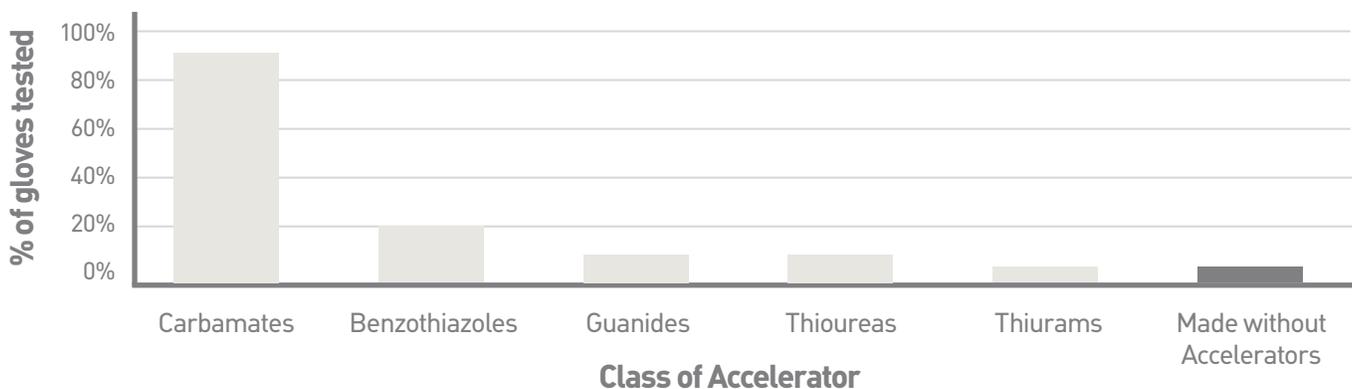
- Friction
- Chemicals
- Heat
- Long-term water/wet work
- Excessive sweating
- Poor hand hygiene

Glove-Associated Chemicals²⁰

- Accelerators
- Antioxidants
- Emulsifiers
- Dyes
- Dispersing agents
- Hardeners
- Natural Rubber Latex

Among the glove-associated chemicals, accelerators are the most common cause of allergic contact dermatitis.²⁰ Accelerators are added to gloves to speed up the rate of vulcanization, the process that chemically crosslinks macromolecules of both natural rubber latex and synthetic gloves adding strength and other favorable functional properties to the gloves. The chemical accelerators most commonly used in synthetic gloves include Thiazoles, Thiurams, Carbamates, Thioureas and Diphenylguanidine. Close to 90% of gloves use Carbamates which can cause sensitivities for some individuals.²⁷

2018 Study of 8 Glove Manufacturers (190 Different Glove Lines)²⁸



To address the recent increase in ACD reactions to synthetic gloves, certain glove manufacturers are developing glove products that are made without accelerators. HCWs who have identified chemical accelerators as a source of sensitivity or cause of irritant contact dermatitis should ask manufacturers to provide the chemical content of their gloves so that troublesome chemicals can be avoided.

Avoiding Irritants and Allergens Are Among Management and Prevention Measures

Management and prevention of contact dermatitis to surgical gloves beyond medical treatment of the dermatitis includes:²⁸

- Determining whether reaction is ICD and/or ACD by seeking professional attention
- Identifying cause(s) of irritation or allergic reactions
- Avoiding irritants/allergens (refraining from work until the lesions are healed may be required)
- Substituting glove products such as use of synthetic gloves made without chemical accelerators known to cause contact dermatitis
- Educating about proper hand hygiene

Summary

Surgical nurses are at the highest risk of acquiring occupational contact dermatitis. Latex and synthetic surgical gloves can cause both irritant and allergic contact dermatitis. Irritants include long-term wet work, occlusion, chemicals, friction, and excessive sweating. Allergens include rubber and chemicals used as accelerators. Prevention strategies include avoiding irritants and allergens by switching to different products, such as gloves made without chemicals known to cause contact dermatitis.

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