

# Occupational hand dermatitis: clinical features, prevention and treatment

## Abstract

Occupational Hand Dermatitis (OHD) is a socially significant health problem and one of the most frequently recognized occupational disease with a prevalence up to 30% in some occupations of increased risk like metal workers, hairdressers, cleaners and healthcare workers. Wet work and chemical agents alters normal structure and functions of the skin. It may be regarded as a mild dermatological problem. However, in some people it lasts for years in severe forms that can have a great impact on daily life and also restrict someone's ability to work. OHD accounts for more than 80 per cent of contact dermatitis cases. Some studies have indicated that OHD has considerable impact on quality of life and may lead to depression. OHD is characterized by a chronic course with relapses upon contact with allergens or irritants. Management is complicated by lack of effective and reliable diagnosis.

**Keywords:** occupational hand dermatitis, hyperkeratotic hand dermatitis, occupational disease, desquamation, moisturizers

Volume 2 Issue 1 - 2018

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**Received:** February 08, 2018 | **Published:** February 20, 2018

**Abbreviations:** ICD, irritant contact dermatitis; OHD, occupational hand dermatitis; ACD, allergic contact dermatitis

## Introduction

Repetitive irritant insults to the skin barrier not strong enough to an acute reaction but capable of damage over a longer period of time is the routine. Lesion happens after exposures to wet work, chemical irritants detergents, wearing occlusive glove material, and excessive hand washings (more than 20 times daily). The earliest warning signs of skin damage are redness, dryness, pruritus and desquamation by the finger webs or back of the hand and this is the right moment when worker must avoid contact with the irritating material and should be removed for another task or even be excused from work.<sup>1</sup> A combination of clinical patterns usually acts concurrently.

### Irritant contact dermatitis

Irritant contact dermatitis (ICD) accounts for more than 80% of OHD being the most prevalent type resulting from multiple sub threshold insults by weak irritants. Repetitive nature of the irritants does not allow the skin to recover. The need for patch testing might be less imperative (Figure 1).



**Figure 1** Irritant contact dermatitis in metalworker. The patient was not properly treated nor removed from the aggressive workplace irritants, so these lesions progressed to extreme chronicity with fissured, infiltrated and desquamative plaques. Some of these patients develop additional contact sensitization if they have predisposing factors like flexural eczema in childhood, asthma or pollinosis. Metal freezing fluids act both as irritants and potential allergens. Its formula contains biocides/preservatives and a worker can develop both type of dermatitis from metal working fluids.

### Type IV Allergic Contact Dermatitis (ACD)

The allergic type is the second most common type of hand eczema. Involvement of the ventral wrists with lichenification is very typical. So, these patients are significantly more likely to have a contact allergy and should be patch tested. The treatment of ACD is avoidance of the allergen considering he will always be allergic. The focus must be protecting the skin by changing the way the irritant comes into contact the way the handling is done and improving protective equipment (Figure 2).



**Figure 2** Chronic fissured allergic hand eczema. Patient is a metalworker who patch tested positive to metals (nickel and cobalt) and preservatives (Methylchloroisothiazolinone).

### Frictional and hyperkeratotic hand dermatitis

This is the result of shearing force acting horizontally to the surface of the hand. Hard manual work with horizontal hand friction (construction and forest workers, machinists, mechanics, paper handlers) leads to hand hyperkeratosis and they not always improve once removed from work environment and sometimes permanent disability work occur.<sup>2</sup> Also, detailed work of handling of small metal components, paper, plastic, cardboard, fabric and bus driving may cause frictional dermatitis.<sup>3</sup> The potential of friction to cause dermatitis is ignored and under-diagnosed (Figure 3) (Figure 4).



**Figure 3** A 30-year-old male patient who used brooms and other cleaning materials in supermarket job developed this dermatitis, difficult to cure. He was removed from the friction task. Modification of the job to decrease frictional forces is sometimes difficult, so gel impaction gloves have shown some promise at prevention of shearing frictional reactions.



**Figure 4** Gel Impaction gloves for the friction task.

Prevention is as important as treatment. Comparison of skin cells as “bricks” and natural oils (lipid layer) surrounding them as “the cement” turns out easy to the patients the comprehension of moisturizers (emollients) as an essential part of treatment. Ceramides 1% containing creams repair the damaged outer skin locking moisture inside. Very few workers use it as they should, repeatedly throughout the day and whenever the skin turns dry.<sup>4</sup>

Wearing protective cotton-lined gloves at work and at home when in contact with irritating chemicals and water is important. The best choice of glove material (rubber, PVC, nitrile etc) will depend on which chemicals or allergens are being handled. Gloves should be clean and dry. Barrier creams must be applied frequently before exposure to irritants. After exposure, washing with soap substitutes, and again moisturize. Alitretinoin (9-cis retinoic acid) 30mg or 10mg are based on vitamin A and are the gold-standard for chronic hyperkeratotic hand dermatitis<sup>5</sup> (Figures 5 & 6) (Table 1).



**Figure 5** Hyperkeratotic hand dermatitis in assembly worker.



**Figure 6** Always be aware of glove latex allergy!

**Table 1** Leaflets on “How to care for your hands” are useful. British association of dermatology (bad.org.uk) has an interesting one directed to patients

Material	Good protection
Latex	Biologic material, water-based solvents.
Nitrile	Solvents, oils, greases, selected acids and bases.
Vinyl Polychloroprene	Acids, bases, oils, greases, peroxides, and amine acids, bases, alcohols, fuels, peroxides, hydrocarbons.
Polyvinyl	Alcohol aromatic and chlorinated solvents, ketones.
Viton (Dupont)	Chlorinated and aromatic solvents, aliphatic, alcohols.
Gel Impaction gloves	Repeat mechanical/physical trauma.

## Conclusion

OHD is regarded as a minor ailment, but if it is left untreated, it will turn out a chronic condition and a significant impact on work and social life. Preventive measures are as important as the treatment itself. Recovery of skin after chemical contact may take long and the worker must leave his workplace. Severe cases need a sick-leave period of 15 to 20 days a time usually needed to restore stratum-corneum. Excessive hand washing should be avoided and alcohol gel is a better choice. Vinyl and cotton gloves instead of rubber and plastic gloves should be used for prolonged periods since sweating inside gloves aggravate dermatitis and to take care for presence of dirt or allergens particles inside the gloves. Gel Impaction Gloves are useful at prevention of shearing frictional impact.

Barrier creams and ointments are very useful if based on Ceramides. Usually they are not. Many barrier creams are based on petrolatum and even allergenic components. Thin smear must be applied to all affected areas many times a day: before work, after washing and when skin dries out. Some jobs turn out impossible to do with creams. Topical corticosteroids are used for 15 to 30 days only to avoid tachyphylaxis and atrophy that may happen from excessive use. Hydrocortisones do not act on thick skin. Antihistamine causes drowsiness.

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vitamin A and are the gold-standard for chronic hyperkeratotic hand dermatitis. A multi-centre study in 111 dermatology clinics by Ruzicka showed excellent results after 24 weeks in half the patients. Systemic immunosuppressants as methotrexate and taking these tablets need careful monitoring. Acute hand dermatitis is indicated for 15 to 30 days, slowly reducing the dose. When hand dermatitis turns out chronic management will usually include patch testing.

### Acknowledgements

We thank Dr Sandy Skotnicki from the Division of Dermatology and Occupational Health, St. Michael's Hospital, University of Toronto for allowing the use of pictures number 4 and 5 as well as her manuscript for the Workplace Safety and Insurance Appeals Tribunal May 2008 which we also recommend (in reference no.4).

### Conflict of interest

The author declares no conflict of interest.

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