

# Occupational Irritant Contact Dermatitis in Healthcare Workers – Meeting the Challenge of Prevention

a report by

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## Introduction

Irritant contact dermatitis (ICD) is the term used to describe red, sore, itchy skin resulting from mechanical or chemical injury.<sup>1</sup> It may develop very quickly or up to 24 hours later. ICD is usually a mild, self-limiting condition but recurs with repeated exposure and may become chronic.<sup>2</sup> It is distinguished from atopic dermatitis, a condition that results from exposure to an allergen in susceptible individuals. However, those with a history of atopy are more at risk. ICD occurs most often in people whose work exposes them to prolonged contact with water ('wet work') and the hands are frequently affected.

Occupational ICD is defined as a pathological condition of the skin for which occupational exposure can be shown to be the main causal or contributory factor.<sup>3</sup> It is a major problem that employers cannot afford to overlook, accounting for more days lost from work than any other occupational disorder apart from musculo-skeletal conditions.<sup>4</sup> For example, in the UK, the Health and Safety Executive (HSE 1995) has estimated that over 84,000 people develop occupational ICD with four million working days lost each year.<sup>4</sup>

Much has been written about occupational ICD and the literature is international, although more research appears to have been conducted in Europe than the UK or the US.

## How Many People are Affected?

A questionnaire study among 20,000 randomly selected citizens in Sweden reported that 25% had developed symptoms during the previous year.<sup>5</sup> Women are more likely to be affected and to perceive their symptoms as severe.<sup>6</sup> Risks in the general population also appear to be associated with heavy domestic commitments, especially child care and lack of access to modern domestic appliances.<sup>7</sup>

Disadvantages of the self-report approach employed in these studies are: low response rate, biased findings (those with problems will respond) and reliance on self-report (which may be inaccurate). Studies in

which the skin is examined by medical personnel are more likely to yield valid findings.<sup>8</sup> Patch-testing is required to identify the irritant.<sup>9</sup>

## Which Occupational Groups are Most at Risk?

People who work in heavy industry, those whose work involves contact with harsh chemicals that have the potential to damage skin and those who are required to undertake wet work routinely are most at risk. They include: young, otherwise fit, men employed as metalworkers,<sup>2</sup> rubberworkers,<sup>10</sup> beauty therapists<sup>11</sup> and bakers.<sup>12</sup> Hairdressers have been the subject of numerous research studies because of the many hours they engage in wet work with exposure to harsh chemicals such as dyes and styling fluids. A major incidence study among 2,272 trainee hairdressers in Germany revealed that 821 (36%) developed skin changes during the three years of their apprenticeship.<sup>13</sup> Additional factors contributing to risk included: low ambient temperature (causing skin to dry); youth (juniors do most wet work) and a history of atopy.<sup>14</sup>

## ICD Affecting Healthcare Workers

Specialists in occupational health medicine recognise that nurses and other healthcare workers are particularly at risk of ICD in view of their exposure to wet work and chemicals (detergents, antiseptics) that can damage skin. It has been estimated that nurses in Denmark undertake an average 3.5 hours (range 0.5 to 9 hours) daily and are exposed to disinfecting products on an average of 21 (range 0 to 70) occasions.<sup>2</sup> Self-report questionnaire studies confirm this high risk of exposure.<sup>15,16</sup>

In these studies, qualified nurses tended to report fewer episodes and less severe damage than unqualified healthcare assistants and cleaners. This is probably because nurses must undergo a comprehensive occupational health assessment before they commence training. Applicants with a history of severe atopy are not considered suitable on occupational health grounds, thus removing one of the major risk factors. For nurses, ICD is a nuisance



rather than a reason for leaving their profession. Nevertheless, it is an occupational health problem that should not be dismissed by managers.

Research studies have repeatedly demonstrated that sore, dry hands are a major disincentive to practising hand hygiene.<sup>17</sup> Failure to comply with hand hygiene protocols is highly undesirable because hand hygiene is accepted by infection control experts worldwide as the single most effective and cost-effective method of preventing infection in healthcare settings.<sup>18</sup> Most healthcare-related infections are disseminated via the hands and decontamination after patient contact has been demonstrated to reduce cross-infection.<sup>19</sup> Traditionally, washing with soap and water removes transient bacteria on the skin that are easily transferred, resulting in cross-infection.<sup>20</sup> Nurses report that soaps dry the skin and make hands sore, a problem that is worse with antiseptics. However, antiseptics are recommended when risks of infection are particularly high because they destroy bacteria and are thus more effective than soap.<sup>20</sup>

Hand hygiene has become so established in standard infection control policies internationally that there is no possibility that nurses or other healthcare workers would ever be advised not to undertake it. For example, wearing gloves does not eliminate the need to decontaminate hands. If the gloves are being used to prevent the transfer of infection to a susceptible patient when performing an aseptic technique (e.g. dressing a wound, catheterisation) the hands must first be decontaminated because gloves can perforate.

Decontamination is necessary when gloves have been removed because the hands may become contaminated through accidental contact with their outer surfaces. Gloves themselves may increase the risk of developing sore, damaged skin. Allergy to the latex in many brands can be exacerbated by the powder they contain is a common problem among healthcare workers.<sup>21</sup> Although the incidence of allergy can be reduced by providing alternatives to latex and powder-free products, the hands become macerated during occlusion, friction causes irritation and there is increased likelihood of developing ICD in response to soaps and antiseptics as a result.<sup>21</sup>

ICD is becoming such an issue among healthcare workers that, in some countries, it is attracting the attention of trade union officials.<sup>22</sup>

### **Why Controlling ICD is Crucial for Healthcare Workers**

Damaged skin is associated with an increase in the number and composition of the bacterial flora of skin.<sup>23</sup> The prevalence of clinically significant species such as *Staphylococcus aureus* and Gram-negative rods

intrinsically resistant to antibiotics rises, with concomitant increase in the total number of bacteria, so that more are present to contribute to cross-infection. There is also significant occupational health risk to staff. Abrasions provide a route of entry to parenterally spread viruses such as HIV, hepatitis B and C, which are associated with considerable morbidity and mortality.<sup>23</sup> These risks are compounded because nurses are reluctant to take sick leave, continuing to work despite marked discomfort from ICD.<sup>15,16</sup>

Another compelling reason for controlling any occupational health hazard among healthcare professionals, especially nurses, is that recruitment and retention is now recognised to be a problem internationally.<sup>24</sup> Nursing is no longer a popular option among school-leavers because the hours are long and unsociable, with poor pay, particularly as the career options open to young women – the traditional recruits to nursing – have now much improved. The existence of occupational health hazards will contribute to the poor image of the profession to new recruits and will not encourage those already employed to stay. Wise managers will be aware of this problem and will wish to tackle it by doing all they can to reduce occupational health risks such as ICD.

### **How ICD can be Avoided**

All employees at risk of ICD should be trained to recognise early signs of irritation and take preventative action promptly, reporting symptoms that do not resolve.<sup>6</sup>

Healthcare workers are advised to adopt a rigorous regime of hand care to reduce susceptibility.<sup>25</sup> Purchasers should seek the advice of pharmacists and infection control teams so that hand hygiene products are chosen carefully, in line with evidence-based recommendations. Throughout Europe, the UK and the US, alcoholic preparations are increasingly recommended.<sup>26</sup> An alcohol gel or solution is applied directly to the hands, then massaged to contact all hand surfaces. Alcohols are becoming popular because they are highly effective when frequently applied during patient care, convenient to use (canisters of product can be placed at the bedside, so there is no need to waste time walking to a sink) and are inexpensive.

Emollients are incorporated into the product so that the alcohol content does not cause de-fating and dry the skin. However, some staff are reluctant to use alcohol because their hands are already chapped through frequent traditional decontamination and it causes stinging. The answer is to persevere with the alcoholic preparation so that the skin heals. The initial discomfort will then resolve.

The emollients incorporated into alcohol products eventually build up so that traditional washing is required to remove them. When this is necessary, the condition of the skin can be maintained by applying decontaminant to hands that have already been moistened, rinsing thoroughly and careful drying with good quality, absorbent disposable paper towels. Anecdotal reports from hospitals in which alcoholic products have been introduced indicate that there are now fewer reports of sore, dry hands but the problem is by no means eradicated. At times when staff are obliged to decontaminate frequently, for instance during an outbreak or long shifts (at night shifts), there will always be some risk of ICD.

Managers should ensure that gloves are purchased in a choice of different materials and that staff have been advised not to wear the same ones over long periods of time. If prolonged use is necessary, they should be removed, hands should be washed and dried thoroughly and new gloves put on.<sup>21</sup> The frequency with which gloves should be replaced is not stated in the literature. From clinical experience, 30 minutes seems a reasonable length of time but it may vary between individuals.

Two types of hand-cream have been developed to help reduce the risk of dermatitis: barrier and emollient creams. Barrier creams effectively protect the skin against harsh chemicals but have no moisturising effect.<sup>27</sup> Laboratory studies with animal models and human volunteers have demonstrated that emollients have a beneficial effect on the condition of the stratum corneum, increasing the water content and preventing the drying effect of experimentally-induced irritation.<sup>28</sup> Moreover, regular application of emollients can prevent detergent-induced ICD in healthy volunteers by reducing transepidermal water loss and encourages established lesions to heal.<sup>29</sup> Emollient hand-creams appear to be the most suitable for controlling occupational ICD in healthcare settings where the main risks are exposure to repeated wet work and low-grade irritants such as detergents. Compliance has been good when emollient creams have been tested under 'in use' conditions with hospital staff.<sup>2</sup>

### The Role of Skin Care in Preventing and Treating ICD

The use of emollient creams to prevent and treat established ICD has been recommended by occupational health experts<sup>30</sup> with application before prolonged glove use to reduce maceration, occlusion, and friction.<sup>21</sup> A preliminary study with 137 nurses in the US confirmed the increased rate of bacterial carriage on damaged skin. Most of the nurses applied hand-cream two to three times per shift to reduce the associated soreness and dryness, bringing supplies

from home. Self-selection and supply may not be the best policy, however, as staff may have limited information concerning product ingredients or effectiveness and may inadvertently increase the risks of cross-infection by re-using open tubes that have become contaminated through repeated handling.

In a later study, the same authors found preliminary evidence that supplying staff with emollients at work helped to counteract the effects of repeated decontamination.<sup>31</sup> The product was dispensed in single-use sachets and was well-tolerated. Nevertheless, there are many unanswered questions relating to protocols for application. Optimal frequency remains to be established and probably depends on the condition of the individual's skin, the number and types of decontamination performed (soap, aqueous antiseptic or alcohol). Technique of application also deserves attention. Adequate cover of the hands with emollient is essential to ensure protection – areas of the skin that escape contact will not be protected. Trials have demonstrated that application is poor in all occupational groups so far examined, including hospital cleaners.<sup>32</sup> Employees were asked to coat the hands with labelled emollient, ultraviolet (UV) light was then used to demonstrate which areas escaped contact. Most (=150, 67%) did not adequately protect hands although they recognised the importance of skincare and purchased their own products. All registered surprise at the number of hand surfaces (dorsum, fingers, interdigital spaces) left without protection.

A later intervention study by the same authors demonstrated that employees can be taught how to ensure even cover of hands with emollient using the UV light technique.<sup>33</sup> Continued application by this method over six weeks significantly improved the condition of skin, compared with a group instructed by videotape demonstration only.

### Conclusion

ICD is a significant occupational health problem throughout Europe, the UK and the US. Although it affects many occupational groups more severely than healthcare workers, healthcare staff require special consideration because ICD resulting in broken skin increases the possibility of cross-infection, especially if the associated soreness operates as a disincentive to compliance with hand-hygiene protocols. In addition, work in healthcare settings is likely to involve handling blood and body fluids, placing staff at risk of developing serious, potentially fatal parenteral infections. ICD can be reduced by careful choice of hand decontaminants and gloves, providing emollient creams and encouraging staff to use them as part of the overall infection control and occupational health strategy. Purchasers, managers and pharmacists play a key role in developing and implementing these policies. ■

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