

# St. Michael's

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Inspiring Science.

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## **BACKGROUND**

### **TYPES OF OCCUPATIONAL SKIN DISEASE**

Occupational skin disease (OSD) is one of the most common occupational diseases in many jurisdictions.<sup>1</sup> The most common types of OSD are irritant contact dermatitis (ICD), where workplace irritants cause a direct toxic effect on the skin, and allergic contact dermatitis (ACD) that involves a Type IV immune response to skin sensitizers. Less common occupational skin disorders include: occupational contact urticaria, folliculitis/acne, infections, skin cancer, hyperpigmentation and vitiligo. Though the other types of OSD will be briefly addressed, this strategy is focused on the prevention of occupational contact dermatitis (OCD). The strategies to prevent OCD will, in many cases, also prevent the other types of OSD.

### **CAUSES**

#### Occupational Contact Dermatitis

There are many identified irritants and allergens that can cause OCD. Common irritants include: wet work, soaps and detergents, solvents, food ingredients and metalworking fluids.<sup>1-3</sup> Common occupational allergens include: nickel, chromium, epoxy, acrylates, formaldehyde resins, rubber additives, paraphenylenediamine and preservatives.<sup>1-3</sup>

These causative agents may be found in many industries and jobs. Industries and jobs that more commonly have OSD include: agriculture, beauticians, chemical workers, cleaners, construction workers, cooks and caterers, electronics workers, hairdressers, healthcare workers, machine operators, mechanics, metalworkers and vehicle assemblers.<sup>1</sup> The European Union and Australia have prioritized wet work as a key exposure of concern for OCD.<sup>4-6</sup>

#### Occupational Contact Urticaria

Common workplace causes of occupational contact urticaria include contact with animal products, food products including grains and flours and natural rubber latex.<sup>1</sup>

#### Occupational Folliculitis and Acne

Common workplace causes of occupational folliculitis and acne include exposure to oils and greases. Polyhalogenated biphenyls may cause chloracne.

#### Occupational Skin Infections

Common workplace caused skin infections include scabies and fungal infections but a wide array of biological agents may cause an occupational skin infection.

#### Occupational Vitiligo and Hyperpigmentation

Common workplace causes of occupational vitiligo include a number of anti-oxidants, often used in the rubber industry. Hyperpigmentation may occur following an

injury to the skin and with exposure to repeated friction, burns, UV light exposure and petroleum derivatives.

### Occupational Skin Cancers

The most common workplace exposure leading to occupational skin cancers is sun exposure, experienced by outdoor workers. Other agents that may cause occupational skin cancer include polycyclic hydrocarbons, arsenic and ionizing radiation.

### **DIAGNOSIS OF OCD**

The diagnosis of OCD varies depending on the specific disease. There are validated criteria for the diagnosis of OCD.<sup>7,8</sup> ICD is diagnosed based on the clinical presentation and history of exposure. ACD is diagnosed based on the clinical presentation, history of exposure and results of patch testing. Patch testing is key to the diagnosis of ACD. Access to appropriate patch testing is often limited. First, only a few dermatologists and allergists perform any patch testing. Second, there are only two centres in Ontario with the capability of expert testing for occupational substances. The lack of patch testing may substantially interfere with the diagnosis of allergic contact dermatitis. A recent study from the United States of workers exposed to metalworking fluids found that only 22% sought medical attention and none were patch tested.<sup>9</sup>

### **BURDEN OF DISEASE – OSD**

There are a number of measures to assess the burden of disease. These include prevalence and incidence, clinical burden, effect on the healthcare system, impact on work and function, and cost.

### **The Challenge of Under-Recognition and Under-Reporting**

#### *Under-Recognition*

The first major challenge in determining the prevalence and incidence of OSD is the problem of under-recognition. Under-recognition means that the skin disease is never recognized as occupationally related, and therefore, does not appear in statistics related to prevalence or incidence. The key factor in under-recognition is the failure to link workplace exposures with the skin disease. This may relate to the worker being unaware of their workplace exposures, and therefore, not being able to provide this information to their healthcare provider. It may also relate to the healthcare provider not collecting occupational exposure information from the worker resulting in the link between the workplace exposures and the disease going undetected. It may also result from the employer's lack of awareness of the possible workplace causes of occupational skin disease leading to denial of a possible link.

A particular issue with ACD is the lack of information available related to sensitizers being present in the workplace. There are at least two causes of this problem. First, allergens may not be listed on Material Safety Data Sheets (MSDS).<sup>10,11</sup> Even if the workplace parties consult the MSDS, they will be misled if the allergens are not listed. A second source of missing information is professional health and safety resources such as the ACGIH threshold limit values (TLVs) and the National Library of Medicine (NLM) Haz-Map database. When the three resources were examined for the

ten most common occupational allergens, only the NLM Haz-Map database identified all ten with a skin or contact dermatitis notation. The ACGIH TLV booklet only identified three of the ten allergens with a sensitizer notation and only three of the 10 allergens were identified as a skin sensitizer in the NIOSH Pocket Guide.<sup>12</sup> Should the workplace parties consult these resources, they may be misled and believe there are no allergens present in the workplace even though they are. It should be noted that NIOSH in recent years has updated their skin notations and established specific categories reflecting the type of effect a substance can have on the skin (for example, irritant, allergic or systemic).

### *Under-Reporting*

Even if a work-related skin disease is identified, there is strong evidence that there is significant under-reporting of OSD to various administrative authorities such as workers' compensation schemes. Examples of studies demonstrating this problem in specific workplace groups include hairdressers and healthcare workers. An Australian study documented that only 29% of hairdressers applied for workers' compensation; a Danish study of 7,840 hairdressers found 21% reported their dermatitis to the compensation authority; and a study in Copenhagen found only 11% of cases were reported.<sup>13-16</sup> A study of healthcare workers found only 12% notified authorities.<sup>15</sup> A recent Cochrane review is focused on interventions to increase the reporting of occupational disease by physicians.<sup>16</sup>

### **Prevalence and Incidence**

There are a number of sources of information related to prevalence and incidence of occupational contact dermatitis. However, given the challenges of under-recognition and under-reporting, it must be remembered that administrative sources will significantly under-estimate the incidence and prevalence of OCD.

### **Administrative Databases**

A key source of information is administrative databases including reporting to government or workers' compensation authorities. As explained above, a key challenge with this source of information is under-recognition and under-reporting. The most reliable sources are various European schemes although even here there is considerable under-reporting as evidenced in the studies cited above.

The annual incidence of OSD is reported to be between 5.7 and 101 cases per 100,000 workers per year.<sup>1</sup> In one study, OSD accounted for 34% of occupational disease.<sup>18</sup>

### **Voluntary Reporting Schemes**

Another source of information is voluntary physician reporting schemes which also suffer from a lack of complete reporting. The major schemes are EPIDERM and OPRA in the United Kingdom. While not able to provide accurate prevalence or incidence information, these reporting systems provide useful information on the occupations at risk and causative agents.<sup>19</sup>

## Clinical Populations

A third source of information is clinical populations, particularly clinics which carry out patch testing to diagnose ACD. Clinical populations of workers with OCD provide useful information on causative agents. In particular, when patch test results are examined over time, trends of increases and decreases in the percentage of positive responses can demonstrate the effect of a control measure that has been implemented or the emergence of either a new workplace allergen or the re-emergence of a known workplace allergen in a different setting. For example, the implementation of regulation in Europe to reduce chromate exposure in cement has been accompanied by a decline in chromate positive patch test results.<sup>20</sup>

## Workplace-Based Studies

A different source of information that avoids a number of the factors leading to under-recognition and under-reporting are workplace-based prevalence or incidence studies. As this type of study is time and cost intensive, there are relatively few. There have been workplace or industry-based studies in several industry sectors.

There have been a number of recent studies of healthcare workers. These studies have found prevalence rates of 20-25%.<sup>16,21-23</sup> A recent study of student nurses followed for three years, found a one year period prevalence of hand dermatitis of 23% in the first year, 25% in the second year and 31% in the third year.<sup>24</sup>

There have also been studies of hairdressers with prevalence rates in the 35% to 45% range.<sup>15,25</sup> A recent study of workers exposed to metalworking fluids found a prevalence of 22% for skin changes in those exposed to the fluids.<sup>9</sup>

## Clinical Burden

Even though a diagnosis of OCD is made, many workers may continue to have clinical disease after diagnosis.<sup>1</sup> OCD is often chronic with 50% of workers continuing to report symptoms after 15 years.<sup>26</sup>

## Impact on Hand Function and Quality of Life

OCD may have a significant impact on worker's quality of life.<sup>1</sup> This includes troublesome symptoms of itching and pain and interference with a variety of daily activities.<sup>27,28</sup> Those with OCD were more likely to have itching and pain, interference with daily activities, interference with work, interference with sleep and relationships and finding the treatment messy and time-consuming than those with non-work-related contact dermatitis.<sup>27</sup> OCD may also impact hand function. An Ontario study of workers with hand dermatitis found over 80% experienced impairment of grip strength and over 50% had impairment of restriction of some hand movements.<sup>29</sup>

## Impact on Healthcare System

Because workers are often not diagnosed on their first visit to a healthcare provider, there is significant health services utilization as workers repeatedly visit a variety of physicians seeking diagnosis and treatment.<sup>30</sup> As the problem is not initially recognized as work-related, these costs are allocated to the public healthcare system, not the workers' compensation system. This results in both financial cost to the system

as well as many physician visits, and potentially, a poorer outcome as the longer the delay between start of symptoms and diagnosis, the poorer the outcome.

### **Impact on Work**

OCD may have a substantial impact on work. Even those workers who remain at work have been shown to have a decrease in their productivity.<sup>29</sup> Many workers lose time off work because of their OCD.<sup>1</sup> Many workers end up changing their jobs because of their skin problem or not working at all.<sup>1,31-33</sup> In an Ontario follow-up study at least two years post diagnosis, 69% had lost time from work, 35% at least one month and though 78% were working, 57% had changed jobs, the majority because of their skin.<sup>31</sup> In another Ontario follow-up study at six months post diagnosis, 38% were not working, the majority because of their skin and of those working, 32% had changed jobs, most because of their skin.<sup>31</sup> A German study found 63% of workers with OCD had lost time from work, an average 76 days in the previous year.<sup>33</sup>

### **Costs**

The economic burden of OSD is considerable and includes direct and indirect costs.<sup>16,34,35</sup> Direct medical costs include: treatment, medication and physician visits. Medical costs in Europe for occupational hand eczema are estimated at €11 billion per year. Direct non-medical costs include: travel, informal care, time costs and out-of-pocket expenses. Indirect non-medical costs include: loss of productivity due to reduced performance at work, sick leave, re-training and compensation. The total economic burden of dermatitis in U.S. workers is estimated at 11.5 billion (direct costs: 8.4 billion; lost productivity: 3.2 billion) and the primary sectors affected are: agriculture, forestry and fishing, mining, construction, manufacturing, wholesale and retail trade, transportation, warehousing and utilities.<sup>35</sup> A recent German study found the average societal costs were €8,799 per patient per year.<sup>33</sup> Indirect costs represented 70% of the total.

## PREVENTION – OCD

There are three levels of prevention: primary, secondary and tertiary. Primary prevention which prevents the exposure from occurring in the first place, is the desired strategy. Primary prevention includes the traditional hierarchy of controls including elimination or substitution, engineering controls, administrative controls, personal protective equipment and education and training.

Secondary prevention involves the detection of changes at a pre-clinical or early phase when intervention can lead to reversal of the disease. Screening programs are a secondary prevention strategy. There are characteristics of the disease and the screening activities which are necessary to satisfy the requirements of an appropriate screening intervention.

Tertiary prevention involves preventing impairment and disability in a worker who has developed the occupational disease. Tertiary prevention approaches include medical management and appropriate workplace interventions using primary prevention strategies as appropriate.

The focus of this strategy is on primary prevention. Because secondary prevention (screening) may have a role in the detection of OCD, it will also be discussed. Tertiary prevention will not be included.

### Systematic Reviews and Other Resources

The first systematic review of prevention for OCD was published in 2005.<sup>36</sup> Recently, there have been three systematic reviews of prevention related to occupational skin disease. These include: a Cochrane Review on interventions for preventing occupational irritant contact hand dermatitis; another systematic review of prevention programs for hand dermatitis; and finally, a review leading to evidence-based guidelines for the prevention, identification and management of occupational contact dermatitis and urticaria.<sup>1,3,37</sup> While each review noted the limited number of high quality studies and recommended further evaluation of prevention programs, there was general agreement that there was evidence for comprehensive programs that include: education, skin protection measures (including use of cotton liners with gloves and pre- and post-work creams and moisturizers). While reduction of exposure to the agent is the first priority, there were no studies cited in the reviews regarding this strategy. The experience with the chromate regulation in Europe and the reduction in use of natural rubber latex speaks to the positive impact of elimination. An excellent book summarizing an approach to prevention is by Sithamparanadarajah.<sup>38</sup> Another resource, *Occupational Skin Diseases and Dermal Exposure in the European Union (EU-25): Policy and Practice Overview* is included in Appendix 1.

### Current State

While we now have a reasonable evidence base for prevention, there is little known about the actual state of prevention practices in workplaces. One source of information about OSD prevention is patients attending the Occupational Health Clinic at St Michael's Hospital. Several studies of workers being assessed for OSD conducted over the past 10-12 years have demonstrated that a significant portion of workers report inadequate training, both for general occupational health and safety and skin prevention in particular. In 2000, in a study of 100 workers being assessed for contact dermatitis, 45% reported training related to gloves and 34% reported skin specific training.<sup>39</sup> A study conducted in 2010-2011 of 105 workers being assessed for contact dermatitis found

44% reported training related to gloves at work.<sup>40</sup> A study conducted in 2014 of 140 workers being assessed for contact dermatitis found similar results with 49% reporting skin training.

## **PREVENTION STRATEGY**

Contact dermatitis can be prevented using traditional occupational hygiene measures based on the hierarchy of controls. These controls are addressed in detail in *Objective 1: Focus on Reducing Harmful Exposures*. Improved understanding of where to implement these controls and determine the effectiveness of new primary preventive efforts can be achieved through *Objective 2: Establish Appropriate Reporting and Surveillance Mechanisms*. All levels of prevention (primary, secondary and tertiary) should make use of the best available evidence as discussed in *Objective 3: Ensure Maximum Use of Best Evidence*. To date, primary prevention efforts have been lacking. The main barriers to primary prevention for contact dermatitis seem to be: 1) lack of awareness; and 2) lack of incentives (financial, regulatory). Lack of awareness can be addressed through education of relevant stakeholders as addressed in *Objective 4: Improve Education and Awareness*. Educational programs and enforcement of regulations for contact dermatitis (recommended) should be targeted to high risk exposures, occupations and industries as presented in *Objective 5: Target High Priority Diseases, Exposures, Occupations and Industries*. All of the proposed strategies will be best achieved through active involvement of all parties in the occupational health and safety system as addressed in *Objective 6: Promote Ongoing Engagement and Strategic Partnerships*.

### **Objective 1: Focus on Reducing Harmful Exposures**

Approaches to reducing exposure include: elimination or substitution of harmful substances (irritants, allergens), technical measures (eg., enclosure of the process, automation), administrative or organizational (eg., distribution of work tasks to decrease duration of exposure), skin protection program to maintain skin barrier function, personal protective equipment and education. The role of regulatory activity is also important.

#### Elimination and Substitution

Elimination and substitution are not always feasible, however, there are excellent examples of the effectiveness of such primary prevention methods, such as: 1) the introduction of powder-free gloves which limits the amount of leachable protein in latex gloves; 2) chromate-free cement; and 3) elimination of aldehyde disinfectants (eg., glutaraldehyde). Regulation is a relatively effective way to address elimination and substitution. The example of the regulation of chromate in cement in Europe has seen a decrease in the number of workers with chromate sensitivity. Elimination and substitution may be most feasible for specific agents, often allergens, but may not be possible for more ubiquitous exposures.

Some workers (eg., healthcare, service, automotive sectors) are at an increased risk of developing occupational contact dermatitis because of exposure to wet work. Wet work includes activities where workers: 1) regularly perform the majority of their work (i.e., > 2 hours/day) with their hands in a wet environment; 2) must wash their hands frequently or intensively; and 3) wear protective gloves with occlusion effects (accumulation of heat and moisture) for a corresponding period (the “liquid-tight” effect of protective gloves prevents the evaporation of perspiration which leads to swelling of the

skin with increased duration that gloves are worn thus reducing the skin's barrier effect; because the skin is pre-damaged in this way, it becomes easier for irritants, potentially sensitizing substances or infectious agents to penetrate the skin).

With regards to the prevention of dermatitis caused by wet work, the most effective prevention measures are those which aim to reduce at the source or preferably completely eliminate the exposure to wet work caused by occupational processes entirely or provide engineering alternatives for wet work tasks, such as automated cleaning processes. Such control strategies may not be feasible in some settings (e.g. healthcare).

### Technical Measures

If elimination or substitution are not possible, the next preferred set of control measures comprises those which change the way work tasks are performed (ie., changes to work practices). For example, implementation of “no-touch” techniques for handling wet objects – such as the use of tongs or baskets and crates to raise products out of liquids.

### Administrative

The introduction of administrative time restriction and task rotation control measures are other wet work or irritant exposure controls. These controls arrange for wet work tasks or tasks with exposure to irritants to be distributed amongst a group of workers over time so that no one worker is excessively exposed. An example of this might be the distribution of a task such as hair washing amongst workers in a hairdressing salon, so that this duty is carried out by more than one worker.

### Skin Protection

Another control measure is the development and implementation of a workplace “skin protection program”. A skin protection program would include elements such as the workplace supply of mild hand cleansers, as well as the provision of after-work moisturizers and (if appropriate) suitable pre-work (“barrier”) creams. The skin protection program should be easy to understand and accessible to all employees. Warning signs should be visible to employees with potential exposure.<sup>41,42</sup>

### Education and Training

The provision of ongoing education and training related to all components of the prevention strategy are important to ensure that workers understand the hazards and the prevention strategies in their specific workplace setting. From an educational standpoint, the Health and Safety Executive in the United Kingdom has an extensive body of literature directed at employers and workers on implementation of prevention strategies, including user-friendly guides ([www.hse.gov.uk/skin](http://www.hse.gov.uk/skin)).

### Personal Protective Equipment

The least effective, but most commonly utilized control measure, is the use of personal protective equipment (PPE) often in the form of occlusive gloves. As discussed above, the wearing of occlusive gloves may be regarded in itself as wet work exposure. If occlusive gloves are used for long periods, it is recommended that thin cotton gloves

are worn under the outer gloves to address the potential damage to the skin from excessive sweating. Health and safety guidelines prescribe that PPE including chemical protective gloves and coveralls, is the last line of protection. The reasons for this include:

- PPE can only protect the wearer; control measures at source protect all those in the area;
- If the PPE is sized, selected or used incorrectly, or is badly maintained, the wearer is unlikely to receive adequate protection;
- PPE is uncomfortable to wear and is an intrusion into normal activities;
- PPE may interfere with work; interference may be due to factors such as incorrect size, inappropriate shape, inappropriate thickness (causing loss of dexterity) and incompatible material from which PPE is made;
- Contaminated PPE may present one or more risks to the wearer and third parties such as waste handlers and family members; in the case of family members, risk arises when the contaminated PPE is taken home;
- The extent of protection achieved depends on good fit and attention to detail.

When PPE is used as the last resort, it is the last line of defence between the user and harm; if it does not work for any reason, the user will be exposed to the hazard. This is why PPE must be selected, used and maintained and stored correctly.

The situations where employers are required to provide PPE for dermal exposure protection include:

- Where dermal exposure risks remain (residual risk) even after implementing *reasonably practicable* controls at the source (eg., process, engineering and administrative) to ensure adequate safe working distance (SWD) between the chemicals and the skin;
- Short-term or infrequent dermal exposures where implementing controls at source to establish suitable SWD is not reasonably practicable;
- As an interim measure, while other control measures are being put in place to achieve adequate dermal exposure control;
- For dealing with emergency work that cannot wait until suitable controls at source are put in place;
- To deal with temporary failure of control where other means of control is not reasonably practical;
- Emergency rescue by trained personnel

Exposure of the hands to chemicals is an important and significant contributor to total skin exposure. It has been shown that the exposure of the hands accounts for between 50% and 90% of total skin exposure. To mitigate this problem, it is common practice to provide gloves rather than establishing short working distance between the skin and the contaminants by other measures. This could be the reason that chemical protective gloves are one of the most widely used forms of PPE. Gloves are used for providing localized protection to the skin from irritant, allergic and corrosive substances and/or protection against chemical uptake through the skin.

Many factors affect the performance of chemical protective gloves including:

- glove factors (permeation, penetration and degradation)

- mechanical and physical factors (stretching, flexing, tearing, exerted pressure between gloved hand and tool, etc.)
- glove material
- dexterity, grip and comfort
- internal contamination (due to various incorrect use patterns)
- temperature and humidity (can affect structure and integrity of some glove materials)
- glove-related skin problems (materials used in their manufacture may cause irritation or allergy)

### Enforcement

Barriers to the implementation of the above identified prevention measures include lack of awareness and/or lack of incentives (financial, regulatory). Educational efforts targeted at employers and workers will help, but may not be fully effective in the absence of regulatory requirements specifically addressing occupational skin disease. Development of legislation is a medium to long term objective in the overall disease prevention strategy, while educational efforts with the focus being on technical measures, organization, skin protection program and use of personal protective equipment could be short term objectives. Consideration could be given to focusing on controlling skin exposure to wet work. For all, there exist materials and regulations that could be used to develop Ontario specific materials and legislation.

From a regulatory perspective, the prevention of OSD is covered under the general duty clause of the Occupational Health and Safety Act but there are no specific regulations related to prevention of OSD. In Germany, a regulation for wet work exposure is in effect (BauA German Federal Institute for Occupational Safety & Health, Appendix 2).

There are currently no comparable occupational exposure limits (OELs) for dermal exposures as for inhalation exposures (and none in the foreseeable future). From a regulatory perspective, the simplest approach that could be taken in Ontario would be to do the same as has been done in various countries of the European Union and Australia and adopt a guideline for the prevention of occupational dermatitis caused by wet work. Ontario could also adopt the use of the newly revised NIOSH skin notations (refer to Appendix 3: NIOSH Current Intelligence Bulletin 61: A Strategy for Assigning New NIOSH Skin Notations).

### **Objective 1 - Key Actions**

#### *Short Term*

1. Review NIOSH skin notations and consider if they could be used as a guide in Ontario for organizations involved in the OHS system;
2. Identify programs in place in other jurisdictions (eg., Germany – hairdressing) that could be trialed in Ontario;
3. Review regulations focused on skin exposures in other jurisdictions;
4. Collect and review available resources on occupational skin disease to develop a tool kit of resources and training materials; CREOD has been working with OHS system partners to develop a skin health tool box containing a number of resources; there is a multi-stakeholder group working on the review and development of fact sheets related to OSD; the resources developed to date are available at [creod.on.ca](http://creod.on.ca)

*Medium Term*

1. Deliver educational materials to various organizations including the Health and Safety Associations;
2. Deliver an educational program to Ministry of Labour inspectors on occupational skin disease and its risk factors (as above); inspectors should issue warnings if exposure to wet work is identified as a cause for concern (using the General Duty clause until a guideline for wet work is developed) and target the appropriate sectors (manufacturing, service, healthcare).

*Long Term*

1. If NIOSH skin notations (and corresponding skin notation profiles) are found to be useful, implement their use in Ontario; Ministry of Labour to consider current guidelines on wet work implemented by the jurisdictions noted above.

## **Objective 2: Establish Appropriate Reporting and Surveillance Mechanisms**

Establishment of surveillance and reporting systems for exposures that cause OSD may be possible. If surveillance on a broad scale were to be undertaken, expansion of CAREX (currently chemical-based and cancer specific) to include dermal sensitizers and irritants could be considered.

Surveillance through screening programs on a smaller scale for example, at the level of individual workplaces, could be feasible and recommended as part of workplace specific health and safety programs. Occupational contact dermatitis (OCD) is one of the most common occupational diseases. The earlier the disease is diagnosed the better the outcome. Screening would seem to have the potential to identify workers at an early stage and implement treatment and workplace interventions to improve outcomes.

Though screening has been suggested for OCD, there are no published reports in the literature related to screening. An important consideration is the capacity of the workplace to conduct screening. In a worksite with an occupational health centre, this may be feasible. However, some industries such as construction and small business in the service sector, present challenges since worksite clinics may be challenging to establish. Thus, there is a need to assess the feasibility of a simple screening tool in the workplace setting. CREOD has implemented a program of research on screening for OCD. Initial work tested screening tools in hospital settings and another study examined hospital employee health unit practices related to OCD. CREOD is now conducting a large feasibility implementation study testing both OHS staff and self-screening methods for OCD in the hospital sector.

The UK HSE has developed informational material ([www.hse.gov.uk/skin](http://www.hse.gov.uk/skin)) for both the employer and workers to check for early signs of dermatitis. The expressed intent of screening for secondary prevention is to: 1) identify susceptible workers (eg., those with pre-existing skin problems (eg., psoriasis, eczema); 2) identify work-related skin disease at an early, and therefore, still reversible stage; and 3) monitor the effectiveness of prevention efforts (control measures).

A useful source of surveillance information for OCD is the Occupational Health Clinic at St Michael's Hospital. It sees approximately 500 individuals per year for evaluation including patch testing and has created a patch test database that will provide information on diagnosis, work-relatedness, workplace characteristics and causative agents. This provides a useful window into workplaces in Ontario and over time can track trends.

### **Objective 2 - Key Actions**

#### *Short Term*

1. Collect and review available surveillance tools (similar to those used by the HSE in the United Kingdom) with a view to recommending those that could be used in Ontario workplaces;
2. Review the experience with screening in other jurisdictions;
3. Continue the St Michael's Hospital patch test database.

#### *Medium Term*

1. HSAs in conjunction with the MOL should develop a tool for employers to assess exposure to wet work in targeted sectors (manufacturing, service, healthcare);
2. Based on the results of the CREOD feasibility implementation study of screening tools, consider implementation of screening in organizations at high risk for OCD;

3. Continue the St Michael's Hospital patch test database to provide ongoing information on contact allergens, OCD and causative agents.

#### *Long Term*

1. If screening is found to be feasible, the HSAs in conjunction with the MOL should convene a process to consider the use of surveillance and screening for OSD;
2. A centralized surveillance database may not be feasible though expansion of CAREX (currently chemical-based and cancer specific) to include dermal sensitizers and irritants could be considered;
3. Continue St Michael's Hospital patch test database to provide trend information on contact allergens, OCD and causative agents.

### **Objective 3: Ensure Maximum Use of Best Evidence**

High priority areas for targeted intervention to reduce OSD are generally well known and, for the most part, the groundwork regarding evidence for and implementation of control strategies has already been done by countries within the European Union. Use of this data and guidance information forms the evidence base to ensure that the best evidence is being utilized.

To operationalize primary and secondary prevention strategies, stakeholders require knowledge about OSD. This process requires capturing the evidence and delivering it to HSAs and other occupational health and safety system partners, who in turn, will deliver it to employers and workers through effective knowledge transfer and exchange. This can be accomplished through the HSAs (in consultation with CREOD) by the provision of guidance documents and other educational tools, as well as through training programs for workers and health and safety representatives. Occupational hygienists and inspectors must also be trained with regards to occupational skin disease awareness including current methods / tools available for skin exposure assessment (eg., wipe samples to determine surface contamination or colour indicating pads worn under PPE to detect chemical breakthrough). Education of healthcare providers is of the utmost importance to address informal surveillance for the condition by general practitioners and other providers. This will facilitate identification of cases and increase reporting, as well as referral to specialized centres for more detailed assessment when appropriate.

Funding for future research on OSD could place an increased focus on prevention, such as the development of intervention studies for specific sectors. CREOD has recently engaged in several WSIB/MOL funded studies related to system needs concerning prevention and also monitoring trends in prevention practices reported by workers with OCD. This provides a window into Ontario workplaces and can provide the OHS system with areas of high risk in the Ontario context. Research such as the health and safety association consultant study, provides evidence-based information about Ontario OHS system needs in this area. The current CREOD feasibility implementation study will provide evidence-based information related to screening. Finally, with the development of various awareness and educational tools, it will be possible to conduct implementation research in the Ontario context. This CREOD work is being conducted in partnership with stakeholders in the Ontario occupational health and safety system. A synthesis of CREOD research findings is included in Appendix 4.

### **Objective 3 - Key Actions:**

#### *Short Term*

1. Continue to facilitate linkages between OSD researchers and the OHS system partners that use prevention information; these include primary prevention (eg., HSA consultants, MOL inspectors, occupational safety and occupational hygiene practitioners to develop effective and evidenced-based guidance documents and educational tools for HSAs, employers and workplaces;
2. Continue support for CREOD as the Research Centre with OSD as a programmatic area (refer to Appendix 4 for a summary of CREOD work on OSD);
3. Educational tools already developed by the European Union could form the basis for tool development (as they are based on best evidence) and tailored to specific industry sectors as appropriate;
4. Continue to work with the provincial medical schools to ensure that undergraduate medical training includes an appropriate level of occupational disease education in the curriculum including training on OSD (Occupational Health Champions Program supported by the WSIB);
5. Work with occupational health and safety training programs in Ontario (e.g. Ryerson, U of T) to ensure they include appropriate content.

#### *Medium and Long Term*

1. Work with the Ministry of Health and Long-Term Care to include occupational histories in the electronic medical records including questions about OSD.

### **Objective 4: Improve Education and Awareness**

With respect to awareness and knowledge about OSD, a CREOD study in the service sector indicated there are significant gaps. Effective prevention of OSD, as with occupational disease in general, requires improved education and awareness of stakeholders. The main stakeholders are workers, employers, healthcare providers, Ministry of Labour inspectors, the Health and Safety Associations and researchers.

These initiatives should be directed initially to sectors that have been noted as having a high incidence of OCD. These include manufacturing (including the automotive sector), healthcare, services and construction. Similar to the European Union and Australia, wet work exposure should be a priority.

To improve education amongst workers and employers, improved incorporation of dermal exposure hazards into Workplace Hazardous Materials Information System (WHMIS) training should be considered and followed as we transition to the Globally Harmonized System of Classification & Labeling of Chemicals (GHS). WHMIS requires both *general* and *specific* hazard training of workers. General training covers such topics as: the regulations, labels, MSDS, controlled products, symbols, etc. Hazard specific training is intended to delve more deeply into preventing hazards specific to a given workplace such as: additional training for work tasks where specific hazards have been identified and the provision of specific personal protective equipment for the task, etc. For hazard specific training in particular, it would be useful to include dermal exposure hazard awareness in workplaces where it is relevant (eg., wet work in healthcare, food services, hairdressing, etc.). Also, enforceable guidelines (ie., wet work) will need to be introduced to provide a clear incentive for employers to adhere to WHMIS legislation.

Educational and awareness materials designed for both the workplace parties and occupational health and safety professionals are currently being developed through multi-stakeholder partnerships between Centre for Research Expertise in Occupational Disease (CREOD) and the health and safety associations and other partners in the occupational health and safety system in Ontario. These resources are available on the CREOD website: [creod.on.ca](http://creod.on.ca)

#### **Objective 4 - Key Actions:**

##### *Short Term*

1. Targeted marketing through the HSAs aimed at the manufacturing, healthcare, service and construction sectors on the existence of OSD and its prevention; resources available from the UK HSE ([www.hse.gov.uk/skin](http://www.hse.gov.uk/skin)), other jurisdictions and the developing CREOD Skin Health Tool Box can be used for this purpose; identify and assemble information on available training (programs, continuing education (CE), etc.); identify gaps in available programs; meet with educational providers to explore delivery of programs to address gaps;
2. Encourage OHS professionals to participate in professional development courses such as those offered by the American Industrial Hygiene Association (a PDC in “Dermal Stress Management” via teleweb long distance learning has been offered in the past);
3. Review models in other jurisdictions e.g. EU and Germany - EUROPREVENTION CAMPAIGN 2010: HEALTHY SKIN @ WORK, EPOS (which includes campaigns at the national level, European level (Declaration of Dresden)) (Hairdressers) and international level (WHO Global Workshop) and determine their application in Ontario.

##### *Medium Term*

1. Examine the current occupational hygiene dermal exposure assessment methodologies currently used in MOL inspections by occupational hygienists;
2. Revise WHMIS legislation to more clearly define dermal exposures and incorporate this into hazard specific training.

##### *Long Term*

1. Develop a “prevention of wet work guideline”; this would strengthen the ability to update and enforce WHMIS specific hazard legislation; this guideline can be developed based on the guidelines previously developed by Germany, the UK and Australia.

## **Objective 5: Target High Priority Diseases, Exposures, Occupations and Industries**

The number of workers exposed to dermal hazards in Ontario has not been well characterized to date, though it is well established that the manufacturing, service, healthcare and construction sectors tend to have the most workers at risk for development of OSD. From this perspective, it would be easiest and most effective to target industries where OSD is known to be problematic rather than exposures or occupations. This can be accomplished through the HSAs; specifically, the Workplace Safety & Prevention Services (WSPS) (manufacturing, farming and services), Public Services Health & Safety Association (PSHSA) and Infrastructure Health and Safety Association (IHSA).

From a long term perspective, if a “prevention of wet work guideline” is developed, then OSD could be a focus of Ministry of Labour enforcement blitzes. The blitzes could focus on the manufacturing, healthcare or service industries. Inspectors could review whether the employer was providing appropriate preventive strategies in compliance with WHMIS (once WHMIS legislation pertaining to OSD and wet work is strengthened), keeping records with respect to worker skin surveillance and skin protection programs.

### **Objective 5 - Key Actions:**

#### *Short Term*

1. Health & Safety Associations to focus educational campaigns and OSD training programs on targeted high risk industry sectors (manufacturing, services and healthcare).

#### *Medium and Long Term*

1. Make wet work the focus of a Ministry of Labour enforcement blitz targeting the manufacturing, services and healthcare sectors.

## **Objective 6: Promote Ongoing Engagement and Strategic Partnerships**

The key stakeholders for OSD prevention are employers, workers, the Ministry of Labour, the WSIB, the HSAs, occupational health and safety professionals and researchers. Development and enforcement of a new “prevention of wet work guideline” would be the responsibility of the Ministry of Labour. HSAs would be integral for development and dissemination of information and training for OSD prevention. Employers would ultimately be responsible for ensuring compliance with the wet work guideline and WHMIS if developed or amended respectively. Employers would need to put the recommendations into practice.

Occupational health professionals and physicians specializing in the area of OSD should also be considered key stakeholders with respect to partnerships for OSD prevention. This is because they are in the best position to educate stakeholders on OSD which ultimately provides justification for prevention efforts.

In order to promote ongoing engagement and strategic partnerships for OSD prevention, it would be useful to establish a working group that includes key stakeholder representatives to discuss and make recommendations around implementation of high priority prevention initiatives. The working group could initially consider OSD prevention generally and also address compliance through a wet work guideline and updated

WHMIS legislation if these are deemed appropriate. The working group could also consider targeted consultation with employers to ensure recommendations can be reasonably implemented or if there are certain exclusions that should be considered. The working group could include employers, workers, the Ministry of Labour, WSIB, HSAs, occupational health professionals, physicians and researchers specializing in OSD.

#### **Objective 6 - Key Actions:**

##### *Short Term*

1. CREOD has established a working group consisting of key stakeholder representatives to address the development of OSD prevention resources; it would be helpful to have a formal Occupational Disease Working Group at the Ministry of Labour level to ensure an effective connection with the Prevention Office. This group could include employers, workers, the Ministry of Labour, WSIB, HSAs, occupational health professionals, physicians and researchers specializing in OSD.

##### *Medium Term*

1. The formal working group to address legislative initiatives addressing the hazard of wet work, including the need for and ultimate structure of a wet work guideline and amendments to WHMIS to further delineate requirements (further education) for OSD.

##### *Long Term*

1. If a “prevention of wet work guideline” and updated WHMIS legislation is developed, the working group could address educational programs to assist in compliance with the guideline.

### **PREVENTION STRATEGY CONCLUSIONS**

In summary, key components of the OSD prevention strategy include:

1. Enforcement support (guidance notes, regulations)
2. Increased awareness
3. Increased education on key prevention strategies
4. Reminder of the importance of early detection
5. Use of existing sources of surveillance type data, particularly clinical data from St Michael’s Hospital Occupational Health Clinic
6. Ongoing support for research and development focused on OSD including multi-stakeholder review and development of tools and resources such as the CREOD Skin Health Tool Box.

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