Worker Health Care Journey
CREOD Research Summary
April 2023

BACKGROUND

The workers' health care journey including health services utilization can be viewed from different perspectives including timelines for care, barriers and facilitators to care and clinician practices related to the diagnosis of occupationally related disease.
Definitive diagnosis of the work-relatedness of some occupational diseases is critical to effective treatment as changes to exposures are needed.
We summarize here work addressing these various topics for occupational contact dermatitis (OCD), occupational asthma (OA), and hand-arm vibration syndrome (HAVS).

EXECUTIVE SUMMARY

1. Workers with occupational disease often spend significant time in the health care system seeing different clinicians before assessment and definitive diagnosis
2. Reasons for delay include system and patient factors
3. Research findings have continued to inform and improve diagnostic and treatment practices

A summary of key articles from CREOD researchers related to the health care journey for OCD, OA and HAVS are summarized in Table 1. Following the table key findings are outlined by disease. For some of the shorter latency occupational disease the time between onset of symptoms and definitive diagnosis and management is related to outcomes with the shorter the time the better the outcome.

Table 1. Worker's journey through the health care system with relevant timepoints and studies included in the review

	Occupational contact dermatitis (OCD)	**Occupational asthma (OA)**	**Hand-arm vibration syndrome (HAVS)**
Time to initial presentation to health care providers	Holness, 2004[2] Kwok et al, 2008[7] Holness, 2011[8] Nurmohamed et al, 2014[9]	Poonai et al 2005[3] Santos et al, 2007[6]	Bodley et al, 2015[10]
Barriers to initial presentation	Nurmohamed et al, 2014[9]	Poonai et al 2005[3] Santos et al, 2007[6]	Bodley et al, 2015[10]
Type of health care provider/facility consulted for initial presentation/ assessment	Butalia et al 2003[1] Holness, 2004[2] Kwok et al, 2008[7] Nurmohamed et al, 2014[9]	Santos et al, 2007[6]	Bodley et al, 2015[10]
Referral to specialists/specialized clinics	Holness, 2004[2] Holness et al, 2007a[4] Nurmohamed et al, 2014[9]	Holness et al, 2007b[5] Santos et al, 2007[6]	Bodley et al, 2015[10]
Time to definitive diagnosis		Santos et al, 2007[6]	

	Occupational contact dermatitis (OCD)	Occupational asthma (OA)	Hand-arm vibration syndrome (HAVS)
Practices related to diagnosis including obtaining work history	Butalia et al, 2003 Holness et al, 2007a[4] Holness, 2004[2] Kwok et al., 2008[7]	Holness et al, 2007b[5] Santos et al, 2007[6]	Bodley et al, 2015[10]
Barriers related to diagnosis	Holness et al, 2007a[4]	Holness et al, 2007b[5] Santos et al, 2007[6]	
Treatment medical	Holness, 2004[2]		
Treatment Advice about work	Holness 2004[2] Kwok et al , 2008[7] Holness 2011[8]		
Outcomes post diagnosis and/or treatment	Holness, 2004[2] Holness, 2011[8]	Santos et al, 2007[6]	
Satisfaction	Butalia et al, 2003[1]		
Follow-up following definitive diagnosis	Holness 2004[2] Holness 2011[8]		
Clinician numbers of seeing OD	Holness et al 2007a[4]	Holness et al 2007b[5]	

OCCUPATIONAL CONTACT DERMATITIS (OCD)

A number of studies examined components of the worker's journey through the health care system and outcomes for those with potential occupational contact dermatitis. The participants in the studies involving patients were all recruited through the occupational medicine clinic at St Michael's Hospital.

Butalia et al. conducted an initial pilot study focused on health care utilization involving 22 patients in 2002.[1] Holness and colleagues recruited 100 workers being assessed for possible OCD in 2000-2001 for a study examining multiple aspects of prevention and also included information about health care.[2] Seventy eight had a final diagnosis of OCD after clinic assessment. Two follow-up surveys were completed for these workers, one at 3 months post diagnosis (N=75 for those with OCD) and the other at 6 months (N=60 for those with OCD).[2,8] Kwok et al. investigated factors that affect timely presentation for patch testing among 39 workers with suspected CD or OCD.[7] Nurmohamed et al. conducted a study of 149 participants in 2013 investigating health care utilization and barriers to care.[9] 57 (38%) had a final diagnosis of OCD.

Another study carried out by Holness et al. collected information about on practice patterns of OCD, barriers to early recognition, and educational needs of 70 dermatologists and 107 family practitioners in Ontario in 2004.[4]

The results of these studies are summarized below.

Time to initial presentation

Several studies examined the time from symptoms to initial presentation. Kowk et al reported a mean time of 109 days (range 1-285).[7] In another study the average time from onset to definitive diagnosis at the occupational medicine clinic was 25 months.[2]

Nurmohamed et al noted the following wait time until first seeking care for the overall group of 149: less than one month 27%, one to three months 28%, three to six months 17%, six to twelve months 8% and greater than 12months 20%.[9] For the 57 with a final diagnosis of OCD, 56% presented with the first 3 months.

Barriers to initial presentation

The focus of the Nurmohamed et al study was barriers to initial care.[9] For the 57 patients with OCD the reasons for waiting until seeking care were (note an asterisk means this reason was significantly higher in those with OCD vs those with non-worked dermatitis):

- thought would get better – 73%
- symptoms not serious enough 47%
- symptoms not limiting ability to work 35%
- symptoms not limiting regular activities outside of work 19%
- concerned about missing work for appt 20%*
- thought symptoms were a natural consequence of work 18%*
- concerned about losing job 20%*
- co-workers had similar symptoms not a big deal 17%*
- worried seeking med attention lead conflict at work 11%
- worried about cost of treatment 11%*
- thought the doctor couldn't help 7%
- anxious about symptoms and preferred not to have them looked into 9%

For the overall group of 149, the main reasons for seeking care were

- not better or worse 51%
- symptoms bothersome 24%
- getting hard to work 8%
- appearance/involve face 7%
- healthcare provider arranged 4%
- wanted to know cause 3%

Type of health care provider/facility consulted for initial presentation

Several of the studies examined the type of provider and type of facility accessed. In some instances the number of times the provider was seen was also examined.

Family physician

The following studies reported on the percentage of patients who saw their family physician and in some cases also the number of visits.

- Butalia et al[1] – 95%
- Holness[2] - 95% (median # visits 3, range 1-90)
- Kowk[7] - family physician 85%
- Nurmohamed[9] - Those who had OCD - 56%

Dermatologist

The following studies reported on the percentage of patients who saw a dermatologist and in some cases also the number of visits.

- Butalia[1] 70%
- Holness[2] 71% (median # visits 3, range 1-11)
- Kowk[7] - 74%

Types of facility

Type of facilities accessed also include walk-in clinics (28% in Kwok et al[7]; 29% in Holness[2], 24% in Nurmohamed et al[9]), emergency departments (15% in Holness[2], 5% inn Nurmohamed[9]) and occupational health clinics outside of work (4% in Holness[2]).

Several studies collected information about health services in the workplace. Kowk et al [1,7,9]reported 8% accessed these services, Butalia et al noted 36% used workplace services and Nurmohamed et al reported 13%. Holness asked further questions about workplace health services.[2] Participants were asked whether a nurse or physician were preent in the workplace and if so, if the worker saw them. 28% reported having a nurse present at workplace and 81% of those with nurse present reported consulting the nurse for their skin problem. While proportion reporting physician present in the workplace was similar (25%), only 69% reported seeing the physician for their skin problem when present.

Referrals to specialists/specialized clinics

Information concerning referral patterns was examined in by Holness.[2] Of the 78 workers participating in the study, 76% were referred to specialists by their family physician. Referrals included to dermatologists (77%), occupational medicine physicians (16%), and allergists (5%). Similarly, 58% of workers were also referred to other physicians by a dermatologist including 96% to an occupational medicine physician and 4% to other dermatologists.

Referrals to the occupational health clinic were made by dermatologists (55%), family physicians (17%), non-specialist occupational medicine physicians (13%), occupational medicine specialists (10%), allergists (3%), and nurses (1%).

The study by Nurmohamed et al examined referral times.[9] For those with a diagnosis of OCD, they found 82% were referred to dermatologist before being referred to the occupational medicine clinic at St Michael's Hospital. If these workers saw a dermatologist, the wait time for 59% was less than three months. Referral sources to the occupational medicine clinic included 58% from dermatologists, 14% from family physicians and 24% from the WSIB.

Additional information on referrals comes from the study of family physicians and dermatologists and their reporting of their practice.[4] Only 11% of dermatologists and 13% of family physicians reported always diagnosing OCD themselves. 24% of dermatologists and 10% of family practitioners mostly refer to specialists and 64% and 77% respectively sometimes refer to specialists.

Practices related to diagnosis – obtaining exposure information

Several studies collected information about occupational history taking. Butalia et al found the workers reported that 5% of family physicians and 36% of dermatologists they had seen obtained detailed work exposure information.[1] Participants in the study by Holness reported that only 67% of family physicians asked about their job, 3% asked for additional information about work, and none asked for a Material Safety Data Sheet (MSDS).[2] In comparison, 53% of dermatologists asked about the worker's job, 5% of which asked for additional information about work, 3% asked for a MSDS, and 1% talked to someone at the workplace.

Again, additional information comes for the study of family physicians and dermatologists. Ninety one percent of dermatologists reported taking a history of workplace exposures at least most of the time in comparison to only 57% of family practitioners.[4]

Barriers related to diagnosis

The study of family physicians and dermatologists sheds light on the reasons they do or do not take an exposure history, diagnose occupational disease themselves, refer and suggestions for things to overcome some of these barriers.[4]

The most common barriers to taking a history of workplace exposures for dermatologists include time constraints (50%), lack of knowledge (83%), complicated/excessive forms to fill in (67%) and lack of adequate re-imbursement (50%). Barriers identified by family physicians included lack of time (86%), lack of knowledge (74%) and forgetting to ask (67%).

The three most common barriers related to diagnosis include not having the necessary testing facilities (95% for dermatologists and 60% for family practitioners), not having the expertise (40% dermatologists and 77% family practitioners), time constraints for family practitioners (28%) and lack of adequate re-imbursement for dermatologists (40%). Other reasons included the lack of necessary testing facilities, complicated/excessive forms, lack knowledge of admin/WC, lack of cooperation from employer or WC, patient attitude, concern that patient will suffer financially, wish to avoid medico-legal issues

Reasons for not referring to other specialists were also probed. Dermatologists reported the following reasons: 71% competent to diagnose themselves, 47% lack timely access to specialists, 18% lack access to specialists and 55% enjoy doing the diagnostic process themselves. For family physicians the reasons include: 83% felt competent to diagnose themselves, 63% lack timely access to specialists, 55% lack access to specialists 55% and 29% enjoy doing the diagnostic process themselves 29%

They also provided suggestions for things that would make these tasks easier. These included

- improved remuneration: family physicians 55%, dermatologists 75%
- easily available standard tests: family physicians 53%, dermatologists 64%
- readily available and timely referral sources: family physicians 78%, dermatologists 59%
- templates for asking questions: family physicians 63%, dermatologists 58%
- education on how to initiate a claim: family physicians 50% dermatologists 48%
- 1-800 # or website for info: family physicians 43%, dermatologists 41%
- better education to enable early detection and referral: family physicians 70%, dermatologists 34%

Treatment

Medical

One study asked about medical treatment.[2] Workers reported receiving the following: 100% topical steroids, 19% oral steroids, 23% antihistamines, 6% topical antibiotics and 6% oral antibiotics.

Workplace

Several studies explored management related to the workplace. In the Holness study workers reported the following actions by their family physicians and dermatologists.[2] The workers reported that 4% of family physicians and 1% of dermatologists talked to someone at the workplace, 12% of family physicians and 17% of dermatologists suggested a job change, 6% of family physicians and 8% of dermatologists suggested job modifications and 3% of family physicians and 4% of dermatologists suggested applying for workers compensation.

In the follow-up studies of the 78 workers with OCD other recommendations for treatment revolve around job change and work modifications.[8] Work modifications have included avoiding particular exposures (12%), using different PPE (12%), starting to use gloves (20%), changing glove type (16%), or changing skin regimen (11%).

Follow-up with HCP following definitive diagnosis

The follow-up studies of the original 78 workers with OCD gathered information on both health care utilization post diagnosis and the activities of these health care providers.[8] At the three month point the 75 workers who could be contacted reported the following. 23% reported that their physician wrote letter or talked with employer. At the six month mark the 60 workers who could be contacted reported the following about the use of workplace based health services. Eleven percent reported seeing a nurse and if they had seen a nurse previously 38% saw them again. Six percent reported seeing a physician and if they had seen the physician before, 135 saw them again. Visits to other health providers and facilities at six months post diagnosis included 4% to the emergency department and 2% to a walk-in clinic. Sixty two percent saw their family physicians (median number of visits 2, range 1-6). Their family physicians were reported to have suggested job change (15%) and modifications (9%). Twenty three percent reported seeing their dermatologist (median number of visits 1, range 1-8). Their dermatologist were reported to have suggested job change (21%) and modifications (14%),

OCCUPATIONAL ASTHMA (OA)

Three studies included in this summary reported on the worker's health care journey related to occupational asthma (OA).

Poonai et al surveyed 42 patients with definite or probable OA about the initial assessing physician and reasons for delay in diagnosis.[3] Santos et al conducted a survey with participants recruited from an occupational lung disease clinic and Ontario WSIB asthma claimants.[6] 80 participants who had OA and 87 who had workplace-exacerbated asthma (WEA) completed the survey. Holness et al conducted a mail survey of 65 pulmonologists and 107 family physicians in Ontario to better understand their practice patterns related to OA.[5]

Workplace screening

Santos et al reported that 31% of those with sensitizer induced OA reported workplace screening (of which 63% included a questionnaire and 79% pulmonary function tests).[6] For those with work-exacerbated asthma 11% reported workplace screening (of which 43% included a questionnaire and 90% pulmonary function tests).

Time to initial presentation

Poonai et al found the mean time to diagnosis from symptom onset was 4.9 years (range 0-21, if exclude 4 outliers 3.4y).[3] The time between symptom onset and reporting of symptoms was 0.6 years.

Santos et al reported that the time to first physician visit was 8 months for those with sensitizer-induced OA versus 5.7 months for those with work exacerbated asthma.[6]

Barriers to initial presentation

Pooani et al examined the reasons for delay in discussing the worker's problem with their primary care provider.[3] The reasons included:

- physician did not ask about workplace association with symptoms 41%
- afraid of lost time 38%
- afraid of forced job loss 33%
- underestimation of symptoms by patient 27%
- afraid of forced job change 26%
- appt scheduled at unsuitable time 12%
- patient didn't find time to make the appt 12%

Poonai et al also examined the reasons influencing the disclosure of symptoms.[3] The reasons included:

- symptoms became unbearable 93%
- took advice of friend/family 26%
- presence of workplace screening program 17% (if yes 43% referred to physician through screening program)
- presence of workplace health and safety program 44% (if yes 28% influenced by program)
- aware of exposure to agent that caused asthma 48% (if yes, influenced by awareness 50%)
- co-workers experienced similar symptoms 69% (if yes, influenced by co-workers 24%)
- prior knowledge about OA before diagnosis 7% (if yes, influenced by knowledge 33%).

Santos et al also examined reasons for seeking care.[6] They included:

- 93% when symptoms became worse or unbearable
- 74% thinking that symptoms were work-related
- 63% afraid of a job change

Santos et al also found other reasons included being aware of exposure to an agent at work, coworkers with similar symptoms, and having knowledge of OA before diagnosis also influenced workers to seek medical attention. When they examined associations between delay in diagnosis and other factors, significant associations related to workplace factors those with sensitizer induced OA was lack of awareness of association between symptoms and work and lack of knowledge of WHMIS. For those with work-exacerbated OA associations included absence of a health and safety program at work, absence of a union, lack of awareness of AL and of agents at work that could affect asthma.

Type of health care provider/facility consulted for initial presentation

Poonai et al found that 60% reported seeing their family physician, 26% visited an emergency department and 12% a workplace clinician.[3]

In the study by Santos et al 64% reported seeing their family physician, 30% the emergency department or walk-in clinic and 6% a company physician.[6]

Referrals to specialists/specialized clinics

Poonai et al reported that the sources of referral to the tertiary asthma clinic included 12% from the family physician, 38% from a specialist and 2% from a company physician.[3] They found that the diagnosis was confirmed 62% of the time by respirologists, 7% occupational medicine and 5% allergists.

Only 27% of pulmonologists and 8% of family physicians reported always diagnosing OA themselves. 23% of pulmonologists and 20% of family physicians mostly referred to specialists and 50% and 72% respectively sometimes referred to specialists.[4]

Time to definitive diagnosis

Poonai et al reported that 48% were referred to a specialist after first visit to presenting physician with the mean time to the visit of three months.[3] It took on average 2.2 visits with the specialist before the worker was told that OA suspected. The average time from first visit to a health care provider to definitive diagnosis at the tertiary referral clinic was 2.3 months.

Santos et al found that the median time to the first suspicion of work-related asthma by a physician was one year for work exacerbated asthma and two years for sensitizer induced OA patients.[6] The median time to a final diagnosis was four years.

Practices related to diagnosis

Poonai et al reported that 41% of participants reported that the physician did not ask about workplace association with their symptoms.[3]

Santos et al found that only 54% of those with work exacerbated asthma received an assessment from a specialist. Among those with OA, the most common tests performed were peak expiratory flow recordings at work and outside of work (58%), repeat methacholine challenges during work and outside of work (49%) and skin tests using work agents (29%).[6]

Most pulmonologists (92%) in the study by Holness et al reported taking a history of workplace exposures in comparison to only 57% of family physicians.[4]

Barriers related to diagnosis

Poonai et al noted that 57% reported delays in completing testing to come to a definitive diagnosis.[3] The problems included arranging at and off work asthma monitoring, specific challenge, patient not willing to return to work for a trial of exposure, the patient electing not to have further testing, having difficulty performing pulmonary function tests. Other workplace factors included a lack of exposure information, workplace closure and the employer refusing to allow a work trial.

Factors associated with a longer than median time to final diagnosis included participants with a workplace screening program in place for those with OA (Santos et al).[6]

Most common barriers to taking a history of workplace exposures for pulmonologists include time constraints (60%), lack of knowledge (60%) and forgetting to ask (40%) (Holness et al., 2007). The same barriers were identified by family physicians but at higher proportions including 86% reporting lack of time, 74% lack of knowledge and 67% forgetting to ask.[4]

Barriers to diagnosis include not having necessary testing facilities which would prompt the provider to refer to a specialist and having access to a readily available and timely referral source (Holness et al., 2007).

HAND-ARM VIBRATION SYNDROME (HAVS)

Only one study included in this summary reported on the worker's health care journey related to hand-arm vibration syndrome (HAVS). Bodley et al conducted a survey with 37 men with confirmed HAVS at the occupational medicine clinic at St Michael's Hospital in Toronto, Ontario in 2013.[10]

Time to initial presentation

On average, participants had waited 3 years and 6 months from symptom onset to consultation with a primary care provider.

Barriers to initial presentation

Participants had many reasons for waiting to seek care including symptoms being natural consequences of work or ageing (70%), not thinking symptoms were serious or severe enough (57%), thinking symptoms would eventually get better (49%), symptoms not limiting ability to work (49%), co-workers had similar symptoms and didn't think it was a big deal (49%), worried that seeking medical attention would lead to conflict with employer (41%), symptoms were not limiting regular activities outside of work (35%), concerned about missing work for appointments (32%) or losing job (24%).

In addition, participants did not think that a doctor would be able to help them (22%), were worried about the cost of treatment (14%) or were anxious about symptoms and preferred to not have them looked at (8%).

Type of health care provider/facility consulted for initial presentation

Type of provider

Family physicians were the most common type of health care provider consulted for initial presentation (66%) followed by nurse practitioners (3%).

Type of facility

Types of facilities used also include workplace clinics (14%) and walk-in clinics (9%) .

Referrals to specialists/specialized clinics

Referrals to the occupational health clinic were completed by the compensation board for 95% of participants and by primary care physicians for the rest.

Practices related to diagnosis

Confirmation of HAVS diagnosis was made by clinical assessment, plethysmography, and nerve conduction studies.

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Diagnostic and RTW interventions

CREOD researchers have done many studies that added to both our understanding and improvement of diagnosis and management for workers with OCD, OA and HAVS. Following are lists of publications that have contributed to this knowledge.

Occupational Contact Dermatitis
Diagnostic methods - Patch testing – methods and allergens

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HAVS

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