

## **ALLERGIC CONTACT DERMATITIS AND ATOPY**

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Atopy is a genetic predisposition to the development of allergic reactions and the increased production of IgE upon exposure to environmental antigens. Clinical manifestations of atopy include asthma, atopic dermatitis (AD) and allergic rhinoconjunctivitis (ACR). We hypothesized that the prevalence of allergic contact dermatitis (ACD) would be higher among patients with a history of atopy and with a familial predisposition to atopy.

For this study, we reviewed the patch test database of the UBC Contact Dermatitis Clinic from 2008 to 2012. A personal history of asthma, AD and ACR was recorded. In addition, a family history was obtained and manifestations of atopy in family members were noted. Our data show that the odds ratio (OR) of a positive patch test with a personal history of atopy was 1.39, while the OR of a positive patch test with a family history of atopy was 1.69. Patients with a personal history of atopy also reacted to greater number of allergens than patients with no history of atopy.

We conclude from our study that patients with a personal or family history of atopy have an increased risk of ACD and that atopic patients react to a greater number of allergens. These results provide further evidence for the link between atopy and ACD.

## **IMMEDIATE TYPE I AND PATCH TEST-CONFIRMED TYPE IV HYPERSENSITIVITY TO CORTICOSTEROIDS IN THE SAME PATIENT**

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Corticosteroids are used to treat many inflammatory disorders including allergic conditions, but paradoxically have become an increasing cause of allergic reactions. While IgE-mediated, type I hypersensitivity to corticosteroids remains exceedingly rare, the prevalence of T cell-mediated type IV hypersensitivity exemplified by allergic contact dermatitis has approached 5% in some studies.

We report the case of a 47 year-old woman with a history of severe asthma, treated with a multitude of different steroids during her life, who complained of a dermatitis that worsened with topical steroids. She also suffered an episode of generalized urticaria, tongue swelling, and

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difficulty breathing necessitating subcutaneous epinephrine following an intramuscular injection of triamcinolone. Patch testing to the North American Contact Dermatitis Group-80 panel and to a steroid panel (Chemotechnique) revealed positive reactions to tixocortol pivalate, budesonide, and triamcinolone acetonide. She was referred to an allergist to flesh out the strong likelihood of concomitant type I hypersensitivity to corticosteroids.

To our knowledge, our patient is the first case of allergic contact dermatitis to corticosteroids confirmed by patch testing to have type IV hypersensitivity while also experiencing classic type I symptoms. Only 3 previous cases in the literature have reported a combined reaction. Two of those cases were due to intranasal steroids and the third case had negative patch testing (and therefore unconfirmed type IV hypersensitivity).

## **CUTANEOUS DELAYED-TYPE HYPERSENSITIVITY IN PATIENTS WITH ATOPIC DERMATITIS: REACTIVITY TO SURFACTANTS**

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Background: Patients with atopic dermatitis (AD) have abnormalities in skin barrier function, and are predisposed to developing cutaneous delayed-type hypersensitivity. Soap and detergents are known to exacerbate the breakdown of the skin barrier.

Objective: We sought to assess whether atopic patients in our database were more likely than non-atopic patients to patch test positive to the surfactants cocamidopropyl betaine (CAPB) and cocamide DEA, or to the surfactant precursor amidoamine.

Methods: Between January 1, 2001 and the present, a total of 1674 patients underwent patch testing to the NACDG standard screening series. The incidence of positive patch tests to CAPB, cocamide DEA, and amidoamine among patients with AD (n=242) and without AD (n=1422) was assessed. Statistical analysis was done using a  $\chi^2$  test.

Results: AD was associated with contact hypersensitivity to CAPB, but not to cocamide DEA or amidoamine.

Conclusions: Patients with AD should avoid the use of skincare products containing the surfactant CAPB, but need not avoid products containing cocamide DEA.

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## **POST-TRAUMATIC ECZEMA**

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A 25-year old woman was referred for evaluation of a 3-year history of recurring localized pruritic skin eruptions after venipuncture that began 24-48 hours after a hypodermic needle pierced the antecubital fossa. Patch testing with an expanded North American Contact Dermatitis Research Group Screening Series and a Metals Series (Chemotechnique) was negative at 2 and 4 days, suggesting that the metal needle was not the inciting factor.

A glass slide was used to lightly scratch her volar forearm. Approximately 48 hours later she reported pink papules and pruritus around the site. Examination on days 3 and 6 revealed a 10 cm cluster of edematous pink papules surrounding the scratch site. A similar scratch in the popliteal fossa also reacted with surrounding papular eczema but a scratch to the flank had no response.

A biopsy from day 6 showed focal spongiosis with a mixed perivascular and interstitial infiltrate composed of lymphocytes and eosinophils. Immunohistochemical stains from day 1, 3, and 6 provided insight into the temporal progression of inflammatory cells that could be implicated in the pathophysiology of this reaction.

This patient has a rare case of "idiopathic post-traumatic eczema," as characterized by Mathias (Mathias, 1988), although her specific clinical and histopathologic reaction may be better categorized as localized post-traumatic autosensitization. Intriguingly, she was most sensitive to trauma in areas classically involved in adult atopic dermatitis and resistant to this phenomenon in other sites.

## **TEN-YEAR RETROSPECTIVE ANALYSIS OF PATCH TESTING IN AFRICAN AMERICAN PATIENTS**

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Background: The heterogeneous appearance of allergic contact dermatitis (ACD) and patient skin pigmentation may result in diagnostic difficulty.

Objective: Determine patch testing results of African American (AA) patients over a ten-year period at the Cleveland Clinic Foundation.

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Methods: Retrospective chart review of 138 patients self-identifying as “African American” or “Black” undergoing patch testing between 2003 and 2012. The average age was 45.0 (range: 10-91) and consisted of 106 (76.8%) females.

Results: 102 patients (73.9%) patients had at least one positive ( $\geq 1+$ ) result from patch testing. There were 277 total positive patch test reactions. Most patients (53.6%) had a history of atopy (allergic rhinitis, childhood eczema or asthma). Nickel sulfate (27.5%), fragrance mix (18.1%), bacitracin (13.0%), and Balsam of Peru (12.3%) were the most common sensitizers. The face (31.2%) and hands (21.7%) were most commonly affected; nearly a quarter of patients (22.5%) had more than one affected area. Twenty patients (14.5%) had occupationally relevant positives. The majority of patients (55.8%) received a final diagnosis of ACD.

Discussion: ACD in AA patients appears more lichenified and pigmented. There is less perceived erythema and an early follicular response. As a result, AA patients may experience a delay in diagnosis, possibly due to low index of suspicion.

## **RESULTS OF PATCH TESTING FOR COMPLICATIONS OF ORTHOPEDIC IMPLANTS**

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Background: Some recipients of orthopedic implants will develop complications such as localized or generalized dermatitis, chronic pain, loosening or other device malfunction. When hypersensitivity to a component of the alloy or cement is discovered, removal of the offending material may be curative.

Methods: Between 2007 and 2013, orthopedic surgeons referred 19 patients for assessment of potential allergy to endoprostheses. All patients were patch tested with the NACDG standard series and with a comprehensive metals series. Readings were performed after 48 and 96 hours.

Results: Six patients presented with eczematous lesions, either generalized or localized to the area overlying prostheses. Three had positive patch tests of possible relevance (nickel, nickel and palladium, cobalt). Thirteen patients without skin lesion were referred because of mechanical failure of their device (1 case) or chronic pain with or without swelling or limitation of movements. Patch tests failed to show relevant allergic sensitization to metals or components of bone cement in 12 subjects. One patient with chronic painful synovitis around a knee prosthesis showed positive tests to nickel and palladium.

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Conclusion: In our series, allergy to metals or bone cement was a rare occurrence, possibly relevant in 4 cases. In 15 patients, the subjective complaints of pain and the objective findings of swelling or dermatitis could not be explained by allergic sensitization.

### **THE BEAK SIGN: A CLINICAL CLUE TO AIRBORNE CONTACT DERMATITIS (US)**

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Importance: Approximately one in five persons in North America and Western Europe suffer from some form of contact dermatitis. Airborne contact dermatitis (ACD) can result from exposure to allergen or irritant-inducing materials that have potential for transmission as dust, droplets, or gas. ACD can at times present a difficult clinical diagnostic challenge. We present a new clinical sign to aid in diagnosis and management.

Observations: We report three cases of ACD that present with sparing of the skin of the nose, a finding that we have termed the “beak sign.” The unique distribution of the presenting dermatosis facilitates the diagnosis, and a detailed history of possible exposures may lead to identification of the responsible contactants. In these patients, we determined the diagnosis of ACD by our clinical observation, the patient’s history, and, in some cases, by closed patch testing. All patients demonstrated variable dermatitis distribution, yet consistently showed sparing of the nasal skin.

Conclusions and Relevance: In the appropriate clinical setting (e.g. concordant patient history, known exposures, positive skin-patch testing), the “beak sign” may facilitate a diagnosis and, thus, the clinician’s ability to counsel the patient to avoid continued exposure to the offending agent. In our experience, this sign represents the “face of airborne contact dermatitis,” as it strikingly presents when encountering such patients at initial consultation and therefore offers an instantly recognizable clinical clue in the diagnosis of ACD.

### **LOCALIZED CUTANEOUS HYPERSENSITIVITY REACTION: BULLETT DERMATITIS**

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We report a case of localized dermatitis associated with a retained bullet. A 46 year-old woman presented to our clinic with a rash of 3 months duration. Twenty-one years prior, the patient was shot multiple times. In May 2013, the patient developed an erythematous rash on her left

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mid back, conspicuously located at the entry site of one of her prior gunshot wounds. While the eruption itself was asymptomatic, the patient endorsed musculoskeletal pain in this same general location. On exam, a solitary erythematous, indurated 5 x 7 cm plaque was located on the left mid back with a well-healed scar noted centrally. Skin biopsy was consistent with a hypersensitivity reaction. Chest x-ray confirmed the presence of a bullet in the soft tissues of the back adjacent to the eruption. Patch testing to 128 allergens, including a panel of 42 metals, demonstrated 2+ reaction to 4 metals: nickel sulfate 2.5 % pet, gold sodium thiosulfate 0.5% pet, Vanadium (III) chloride 1% pet, and manganese (II) chloride 2% pet. Additionally, the patient’s dermatitis flared during patch testing, supporting the possible relevance of metal hypersensitivity. We conclude that the retained bullet is the likely cause of the patient’s

localized cutaneous hypersensitivity reaction. There is a potential role for patch testing in patients with concomitant dermatitis and traumatically implanted foreign bodies.

### **NOVEL USE OF PATCH TESTING IN THE FIRST REPORT OF ALLERGIC CONTACT DERMATITIS TO CYCLOBENZAPRINE**

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A 39 year old man with cervical radiculopathy was treated with a compounded topical medication containing ketamine 10%, diclofenac 5%, baclofen 2%, bupivacaine 1%, cyclobenzaprine 2%, gabapentin 6%, ibuprofen 3%, and pentoxifylline 3% in Lipoderm Activemax cream. Although his pain was relieved, he developed an itchy rash at the site of application. Suspecting allergy to diclofenac, the patient's pain doctor changed the compound to exclude diclofenac, but the patient still developed a rash to the new cream. He stopped using the medication, leading to resolution of the rash but recurrence of pain.

We developed a customized patch test by contacting the pharmacy to obtain samples of the individual topical components. Patch testing performed with these preparations showed a positive reaction to cyclobenzaprine but not the other components, including diclofenac. Removal of cyclobenzaprine from the compounded cream resulted in adequate pain relief without causing a rash, confirming that cyclobenzaprine was the relevant allergen.

Topical medications are increasingly used to manage pain, yet topical delivery can lead to sensitization, as exemplified by this first reported case of allergic contact dermatitis to cyclobenzaprine. Customized patch testing is a novel method for identifying the culprit component, especially in cases involving preparations with ingredients that are not in standard patch test series.

Acknowledgements: Bellevue Pharmacy, St. Louis, MO.

### **EPICUTANEOUS PATCH TESTING IN CHILDREN BY THE NACDG, 2005-2011**

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Ecematous dermatitis is common in children; patch testing is vital to the identification of relevant allergens causing or contributing to allergic contact dermatitis. We analyzed data from 760 patch tested children (age 0-18y, screened with a 65- or 70-allergen panel) by the North American Contact Dermatitis Group from 01/01/2005 to 12/31/2011 and used previously published data (2001-2004) for comparison.  $\geq 1$  positive patch test (PPT) and  $\geq 1$  relevant positive patch test (RPPT) frequencies were 61.8% and 56.1%, respectively. PPT and RPPT frequencies (%PPT/%RPPT) were highest with nickel sulfate (28.7/26.2), cobalt chloride (12.3/8.7), neomycin sulfate (7.2/6.6), balsam of Peru (5.8/5.7), and fragrance mix (5.3/5.0).  $\geq 1$  PPT and  $\geq 1$  RPPT frequencies in children did not differ ( $P \geq 0.05$ ) from adults (age  $\geq 19y$ ) or with previously tested children (2001-2004). 24 different allergens had RPPT frequencies that differed between children and adults. Compared to 2001-2004, RPPT frequencies in children decreased for cobalt chloride and diazolidinyl urea, and increased for balsam of Peru.  $\geq 1$  irritant patch test rate was 5.7%. Differences in PPT and RPPT frequencies between children, adults,

and test periods confirm the importance of periodic updates for patch testing in children to enhance clinicians' vigilance to common allergens.

## **ACRYLATE CONTACT ALLERGY PROGRESSING TO A SYSTEMIC CONTACT DERMATITIS**

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Background: Acrylates, the 2012 American Contact Dermatitis Society allergen of the year, are found in a range of industries and products including the absorbent materials contained within feminine pads. When fully polymerized, acrylates are non-immunogenic; however, if not completely cured the monomers can be potent allergens resulting in delayed-type hypersensitivity reactions (type IV allergic reaction).

Objective: A 28 year old female is presented that had her teeth varnished with Septodont's Isodan that contains 2-hydroxyethyl methacrylate (HEMA) with no initial reaction.

Approximately 1 month later, the patient developed a genital dermatitis secondary to her feminine pads. The initial reaction resolved but 5 month's later the patient developed a systemic contact dermatitis after receiving a second varnishing.

Methods: The patient was patch tested to the North American Contact Dermatitis standard screening series, select acrylates, select vehicles and preservatives, sunscreen series, flavours

and fragrances series and the patient's own pads both wet and dry pieces from various layers. Patch test readings were performed at 48 and 96 hours.

Results: The patient was dramatically patch test positive to many acrylates: methylmethacrylate, hydroxyethyl methacrylate, butyl methacrylate, hydroxypropyl methacrylate, ethylene glycol dimethacrylate, triethylene glycol dimethacrylate, butanediol dimethacrylate, urethane dimethacrylate, hexanediol diacrylate, tetrahydrofurfuryl methacrylate, triethylene glycol dimethacrylate, dimethyl ethyl methacrylate, tripropylene glycol diacrylate and trimethylolpropane triacrylate.

Conclusion: This case demonstrates likely a reaction to unpolymerized acrylates within a feminine pad as well as broad cross sensitization to acrylates and the potential for systemic contact dermatitis with re-exposure to unpolymerized acrylates.

## **ACRYLATE SENSITIZATION IN PRECLINICAL DENTAL STUDENTS**

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Two dental students, a 27-year-old female and a 29-year-old male, sought treatment for red rashes on the dorsum of their right and left hand, respectively. Both had developed the rashes after repeated applications of a dental adhesive used as a bonding agent with composite to their gloved hand. Both students were patch tested with T.R.U.E. Test™ Panels 1.2, 2.2, and 3.2 and with the North American Core Series. At their 96-hour reading, both had positive reactions to 2-hydroxyethyl methacrylate (HEMA), 2-hydroxy ethylacrylate, 2 hydroxypropyl-methacrylate, and ethyleneglycol dimethacrylate. The dental adhesive that the students had been using contained HEMA, and they were advised to avoid further mixing of the adhesive on top of their

gloved hands. The male also had positive reactions to cinnamic aldehyde and oleamidopropyl dimethylamine, and the female also had positive reactions to thimerosal, gold sodiumthiosulfate, glutaraldehyde, and fragrance mix II, but no clinical relevance could be established for these additional allergens. Suspicion for acrylate sensitization should be high in dental workers and students with hand dermatitis because dental examination gloves may fail to provide adequate protection from exposure to this allergen.

### **CUMULATIVE IRRITANT CONTACT DERMATITIS IN NURSES**

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Background and Objectives: Cumulative irritant contact dermatitis (ICD) is the most common clinical type of contact dermatitis. Common irritants in the health care setting include soaps, disinfectants, alcohol based hand sanitizers and glove wearing, in addition to wet work. The objective of this study was to review the return to work experience of four nurses with ICD.

Methods: A chart review was conducted examining the return to work experience of four nurses.

Results: In addition to ICD, three of the nurses had allergic contact dermatitis. Removal of the allergen alone did not result in a successful return to work. In addition to proper skin care management and monitoring, administrative changes of either alternating shifts or decreasing consecutive shifts, thereby decreasing the cumulative dose of irritation, resulted in successful return to work.

Conclusions: Administrative controls altering cumulative exposure are an important workplace modification to accomplish successful return to work.

### **DERMATOLOGICAL FINDINGS IN GULF WAR I VETERANS OCCUPATIONALLY EXPOSED TO DEPLETED URANIUM**

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Introduction: Depleted uranium (DU)-containing weapons have been used in military operations since 1991. There is interest in following Veterans who were occupationally exposed to DU by either inhalation or retention of fragments. A cohort of DU-exposed Gulf War I Veterans has been followed longitudinally at the Baltimore Veterans Administration Medical Center (VAMC) since 1993. One of the goals at each visit is to monitor dermatological findings associated with occupational DU exposure.

Methods: 35 Veterans were evaluated. This study was reviewed and approved by the IRB and the VAMC research service. DU exposure was measured using creatinine-adjusted urine U concentrations (U<sub>ug/gCr</sub>). A detailed medical history, physical examination and exposure history was also performed.

Results: Using a cutoff level of 0.1 U<sub>ug/gCr</sub>, 11 veterans were placed in the "high" uranium exposure group while 23 Veterans were placed in the "low" group. Retained fragments were

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documented in 91% of the “high” vs. 13% of the “low” group ( $p < 0.001$ ) and fragment-related scarring was significantly increased in the “high” group ( $p = 0.002$ ). Other dermatological findings like dermatitis and infections were also assessed.

Conclusions: Fragment retainment and related scarring was significantly increased in Veterans exposed to “high” levels of DU. Continuous monitoring of this cohort will yield interesting dermatological findings related to DU exposure.

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### **OCCUPATIONAL COAL TAR ALLERGY: AN OLD STORY REVISITED**

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Coal tar is one of the oldest treatments in dermatology but is also used in different industries such as coke production, aluminum reduction, pipe coating, roofing and paving.

It has often been referred as a contact allergen although reports are scarce. We describe a case of occupational allergic contact dermatitis to coal tar pitch in an aluminum-processing worker.

The patient presented with a one-year history of an eczematous and bullous eruption of the hands, arms and neck, after 25 years working in this industry. A diagnosis of allergic contact dermatitis was made after patch testing with custom-made allergens (coal tar pitch, coke and graphite 10% and 50% petrolatum). Two controls were tested negative.

To our knowledge this case is one of a few to describe the allergenic potential of coal tar and is the first one to be reported in the last 25 years. Coal tars contain a variable mixture of phenols, heterocyclic compounds and polycyclic aromatic hydrocarbons (PAHs). PAHs are thought to be the responsible agents in coal tar allergy.

Whereas coal tar is less often encountered today as a topical treatment, it should be kept in mind as a potential allergen in occupational cases of suspected contact dermatitis.

### **PATTERNS OF SENSITIZATION IN WET WORKERS**

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Background: Wet-work increases the risk of irritant contact hand dermatitis which may increase the risk of allergic sensitization.

Objective: Determine if patients undergoing evaluation for allergic contact dermatitis who perform wet work are more likely to be sensitized to weak and medium potency sensitizers compared to patients who do dry work.

Methods: 1,650 patients patch tested between 2003-2013 were classified as wet or dry workers and included in this analysis. Positive patch tests to weak and moderate potency sensitizers, as defined by the local lymph node assay, were tabulated.

Results: 509 wet workers and 1,141 dry workers were tested to the standard screening series. Hand dermatitis was more common in the wet workers than dry workers (50% vs 29%). There was a higher rate of positive patch tests to weak and medium sensitizers in the wet workers, mostly due to rubber chemicals. There was no significant difference in the percentage of positive patch tests to strong sensitizers in the wet workers compared to dry workers.

Limitations: Retrospective study design. Classifications may not always reflect wet exposures

(e.g. office workers who wash hands frequently would still be classified as dry workers).  
Conclusions: Glove allergens may pose a greater hazard to wet workers than allergens in emollients or medicaments. Strong sensitizers do not require pre-existing irritant dermatitis, such as to wet work, to induce allergy.

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## **COMPLEMENTARY AND ALTERNATIVE MEDICINES AND CHILDHOOD ECZEMA: A US POPULATION-BASED STUDY**

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Complementary and alternative medicines (CAM) are commonly used in the US. However, the prevalence of CAM use in US children with eczema is unknown. Further, it is unknown whether commonplace use of CAM in the US may be associated with higher eczema prevalence. We sought to determine the eczema prevalence in association with CAM usage. We analyzed data from the 2007 National Health Interview Survey from a nationally representative sample of 9,417 children ages 0-17 years. Overall, 46.9% (95% confidence interval [95% CI]: 45.6-48.2%) of children in the US used =1 CAM, with 0.99% (95% CI=0.28-1.71%) using CAM specifically to treat their eczema. The most common CAM used to treat eczema were herbal therapy (0.46%), vitamins (0.33%), Ayurveda (0.28%), naturopathy (0.24%), homeopathy (0.20%) and traditional healing (0.12%). Several CAM used for other purposes were found to be associated with increased eczema prevalence, including herbal therapy (survey logistic regression; adjusted odds ratio (aOR)=2.07, 95% confidence interval (CI)=1.40-3.06), vitamins (aOR=1.45, 95% CI=1.21-1.74), homeopathic therapy (aOR=2.94, 95% CI=1.43-6.00), movement techniques (aOR=3.66, 95% CI=1.62-8.30) and diet (aOR=2.24, 95% CI=1.10-4.58), particularly vegan diet (aOR=2.53, 95% CI=1.17-5.51). Several types of vitamins were associated with increase eczema prevalence, including multivitamins (aOR=1.40, 95% CI= 1.15-1.69), calcium (aOR=2.44, 95% CI=1.21-4.91), vitamin B complex (aOR=3.67, 95% CI=1.44-9.33), vitamin D (aOR=4.56, 95% CI=1.58-13.14), but not iron, vitamin C or vitamin E (P=0.10). Multiple CAM are commonly used for the treatment of eczema in US children. However, some CAM may actually be harmful to the skin and be associated with higher eczema prevalence in the US. Further, prospective studies are warranted to address the risks and benefits of CAM in pediatric eczema.

## **CONTACT DERMATITIS IN SAFFRON WORKERS: CLINICAL PROFILE AND IDENTIFICATION OF CONTACT SENSITIZERS IN A SAFFRON CULTIVATING AREA OF KASHMIR VALLEY OF NORTH INDIA**

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Introduction: Saffron a bulbous perennial plant, belonging to Iridaceae family is the most expensive cultivated herb known as red gold in producer countries, the reverence of which

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emanates from the fact that its widely used for Industrial as well as non Industrial purposes. It is also regarded as a big storehouse of many health benefits. However, besides its attractive and valuable properties, contact dermatitis due to saffron is an uncommon reported entity.

**Materials and Methods:** The present study was conducted in collaboration with the Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir in Pampore, a saffron cultivating area. 110 saffron workers with history and clinical evidence of contact dermatitis due to saffron were patch tested with 39 allergens which included Indian Standard Series antigens, Plant Series antigens (European Series) and antigens belonging to different parts of Saffron flower.

**Results:** Total of 82 positive reactions were observed. The 20 allergens in Indian standard series accounted for 52.44% of the positive reactions. Plant series and different parts of saffron accounted for 47.56 % of positive allergic reactions. Among those patients with positive responses to the supplemental saffron allergens, 89 % of the responses were of present or past relevance.

**Conclusion:** The data observed in the present study confirms that the Saffron dermatitis is a distinct clinical entity with characteristic clinical presentation and has a strong significance as an occupational allergen in those handling this plant. Patch testing with different parts of saffron flower has a role to play in finding out the etiological cause .

## **OVERVIEW OF THE APPLICATION OF CHEMISTRY TO STUDIES OF ALLERGIC CONTACT DERMATITIS AND CONTACT ALLERGENS**

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The chemistry of multiple contact allergens has been studied in our laboratory, often in collaboration with the North America Contact Dermatitis Group. Studies have ranged from screening of a chemical for its allergenic potential to assessment of the content and stability of allergic contact dermatitis (ACD) patch test reagents. Analytical, physical, proteomic, and immunochemical techniques were used to assess the inherent allergenicity of chemicals, identify portals of entry into the skin, sites of binding to skin proteins, assessment of patient provided

materials for allergen content associated with ACD, and analysis of patch test reagent reliability. This presentation reviews (1) a simple direct reading assay for identification of direct acting chemical allergens using p-nitrobenzene thiol and pyridoxylamine chemical probes, (2) the ASTM D7558 and chromatographic methods application for study of allergenic rubber additives from gloves of ACD patients, (3) immunochemical and proteomic studies suggesting the sebaceous gland as a site of active antigen processing and (4) analytical chemistry studies demonstrating the instability of formaldehyde, glutaraldehyde, and methyl methacrylate patch

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test reagents. From these studies, it can be concluded that application of chemical techniques can provide insight enhancing ACD research and diagnostic spectrum.

(All animal and human studies were conducted under approved ACUC and IRB protocols, respectively.)

## **HEALTH CARE UTILIZATION CHARACTERISTICS IN PATCH TEST PATIENTS**

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Background and Objectives: There is relatively little known about the health care journey of individuals with possible contact dermatitis. The objectives of the study were to describe the health care utilization of those presenting for patch testing and identify barriers and facilitators for seeking care.

Methods: Following ethics approval, 149 patients being patch tested completed a questionnaire that obtained information about the practitioners seen, time delays experienced and motivators and barriers to accessing the health care system for evaluation of their skin disease.

Results: Twenty percent waited over a year before first seeking care. Key reasons for waiting included beliefs that: their symptoms would improve, their symptoms were not serious enough or their symptoms were not interfering with work and daily activities. Main reasons for eventually seeking treatment were their symptoms were not getting better and were bothersome. Referral to a community dermatologist and ultimately to the patch test clinic usually occurred within 6 months. Main barriers to access the patch test clinic were wait time and distance to travel.

Conclusions: This study provides useful information on the waiting times for an assessment and the motivators and barriers to seeking care. These factors could be addressed to improve the timeliness of assessment and access to specialized care.

### **HAND ECZEMA: INCIDENCE, PREVALENCE, AND RISK FACTORS FROM ADOLESCENCE TO ADULTHOOD IN A DANISH COHORT**

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Background: 1206 unselected adolescents from a Danish population cohort were followed from primary school into adult life to estimate the incidence, prevalence, and risk factors for hand eczema.

Methods: Participants from a cohort of 8th grade schoolchildren established in 1995 were asked in 2010 to complete a questionnaire and participate in a clinical examination including patch testing (T.R.U.E. Test™).

Results: The incidence of hand eczema was 8.8/1000 person-years. The one-year period prevalence of hand eczema in the young adults was 14.3% (127/891) and the point prevalence 7.1% (63/891) with significantly higher prevalence in women. At the clinical examination 6.4% (30/469) had hand eczema. Factors in childhood of importance for adult hand eczema were atopic dermatitis together with hand eczema. Wet work as adult was a risk factor together with taking care of small children at home. Interestingly, hand eczema among unselected young adults, was associated with sick leave/pension/rehabilitation indicating possible severe social consequences.

Conclusions: A high incidence and prevalence of hand eczema was found in 28-30 years old adults and it was highly associated with childhood hand eczema and atopic dermatitis together with wet work and taking care of small children in adulthood. There was no association to smoking, education level or nickel allergy in childhood.

## **ROLE OF DENTAL RESTORATION MATERIAL IN ORAL LICHENOID LESIONS**

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Background: Dental restorative materials containing mercury compounds have been said to induce oral lichenoid lesions (OLLs).

Objectives: To determine contact allergy to dental restoration material in patients with OLL and to study effect of removal of the material on OLLs.

Results: Forty five patients recruited in three groups of 15 each. Group A (lesions in close contact with dental materials), Group B (lesions extending one cm beyond the area of contact), Group C (no topographic relationship). Thirty controls in two groups of 15 each; Group D (OLLs but no dental material) and Group E (dental material but no OLL). Patch tests were positive in 20 (44.5%) patients. Mercury was the commonest allergen in 8 patients followed by nickel (6), palladium (5), potassium dichromate (2) and eugenol, balsam of Peru and carvone in 1 each. 7 patients were positive to more than one allergen. In 13 of 20 patients who agreed for removal of their dental material, complete healing was observed in 6 (30%), marked improvement in 7

37 (35%) and no improvement in 7 (35%) patients. Relief of symptoms was usually observed after a minimum of three months after removal.

Conclusion: Contact allergy to amalgam is an important etiologic factor in OLLs and removal of restorative material should be offered to patients who have lesions in close proximity to the dental material.

## **BOTANICALS: THE WILD FRONTIER**

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The recent European Scientific Committee for Consumer Safety (SCCS) Opinion was adopted in June, 2012 and provides evidence that 127 ingredients (including 31 botanicals) are established or likely fragrances. However, ACDS CAMP includes well over 2000 botanicals, most of which have not been widely patch tested and it is difficult to determine which ones should be considered possible botanical fragrance cross-reactors. All except 4 of the 31 botanicals in the SCCS Opinion contain one or more of the original 26 fragrances required on product labels in Europe (EUF). In this study, we identify which botanicals contain EUF. These botanicals should be avoided by patients allergic to specific EUF, and are candidates for future study to determine if they are allergenic. This information will allow certain fragrance allergic patients to identify likely safe fragranced products to use. The CAMP cross-reactor committee has redefined the botanical cross-reactor group to include the 31 SCCS botanicals, botanicals containing EUF and composite plants.

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## **POSTER PRESENTATIONS**

### **MANAGEMENT OF CONTACT ALLERGY TO DISPERSE DYES IN TEXTILES AND THE ROLE OF PATCH TESTING**

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Textile contact dermatitis results when a patient develops skin manifestations due to clothing or other fabrics that contact the skin, commonly from chemical additives such as textile dyes, tanning agents, and finishing resins. This study provides a framework for working up and counseling a patient with suspected textile dermatitis, focusing on identifying the textile materials likely to be the cause of the eczematous lesions, the current clinical guidelines, the utility and appropriateness of patch testing, the limitations of these guidelines, and our pro tempore recommendations. Although many challenges exist to correctly identifying and counseling patients on how to avoid offending textile products in a patient with suspected textile dye dermatitis, there is value in following the guidelines set forth to help identify the textile dermatitis source.

Clinicians should instruct patients to categorize and list all colored-fabric textile products that contacted the affected skin areas. The fiber composition, corresponding colorant class, and dye fastness of each suspected garment should then be noted. Lastly, fabrics should be prioritized based on color darkness. While standardized patch tests are useful, dermatologists should understand their limitations for testing patients with suspected textile dye induced dermatitis. These guidelines are expected to increase the likelihood of identifying the causative textile(s) so that patch testing can be supplemented with swatch testing and chemical dye extraction to help discover the allergenic dye.

### **CLINICAL MANAGEMENT OF SUSPECTED FRAGRANCE CONTACT DERMATITIS**

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Fragrances are ubiquitous in skin care products such as creams, shampoos, sun tan lotion, and deodorants. However, when applied to skin, fragrances can cause allergic contact dermatitis. We review the diagnosis, current limitations to patch testing for Fragrance Mix 1 and Fragrance Mix 2, use testing of common consumer products, the relevance of fragrance concentration in products, and our current recommendations in regards to the management of fragrance contact allergy. If contact dermatitis from a fragrance is suspected, the fragranced product should be discontinued for 8-12 weeks. At that point, patch testing for common aromatic

39 allergens included in FM1 and FM2 should be attempted to identify clinically relevant fragrances. If a patient is motivated to use a specific product after the period of abstinence, a Repeat Open Application Test (ROAT) can be performed to ascertain if there is an acceptable exposure concentration. Identification of the offending fragrance and a ROAT to understand appropriate concentration may allow the patient to resume use of the fragranced product in a safe manner.

### **ALLERGIC CONTACT DERMATITIS FOLLOWING HEAVY EXPOSURE TO AN INDUSTRIAL**

#### **PRESERVATIVE USED IN THE ALBERTA TAR SANDS**

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Background: We hypothesize that contact allergens have an intrinsic capacity to activate innate

immune cells, whereas contact irritants do not. This activation is accomplished by signaling through immune receptors. Nickel, Cobalt and Palladium all signal through hTLR4, but it is not known if other contact allergens also use hTLR4.

Methods: A panel of 14 different contact allergens and 3 different contact irritants were analyzed for their capacity to: 1] activate innate immune cells (using human monocytic cell line THP-1), and 2] signal through hTLR4 (using paired cell lines HEK293-hTLR4 and HEK293-untransfected). Activation/signaling was assessed by measuring release of TNF-alpha and/or IL-8.

Results: All of the contact allergens induced TNF-a and IL-8 release from THP-1 cells, whereas the contact irritants had similar concentration-dependant cytotoxic effects, but induced no cytokine release. Nickel, Cobalt and Palladium induced IL-8 release from HEK293-hTLR4 cells but not HEK293-untransfected. The remaining 11 contact allergens (Cinnamic aldehyde, Citral, Diazolidinyl urea, Diphenylcyclopropenone, DMDM hydantoin, DNCB, MCI/MI, MI, Potassium dichromate, PPD, and Thimerosal) failed to induce IL-8 secretion from either cell line.

Conclusion: Since the 11 contact allergens tested are capable of activating innate immune cells, but fail to signal through hTLR4, they must signal through other innate immune receptors, which are present on THP-1 cells but absent from HEK293.

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## **SWEDISH EXPERIENCES FROM PATCH TESTING METHYLISOTHIAZOLINONE SEPARATELY ON BEHALF OF THE SWEDISH CONTACT DERMATITIS RESEARCH GROUP**

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Background: Since the early 80's preservatives based on the combination of methylchloroisothiazolinone (MCI) and methylisothiazolinone (MI) at a ratio of 3:1 have been used in industrial and household products as well as in cosmetics; contact allergy to this mix has been common. Since 2005, MI alone has been allowed in Europe as a preservative in cosmetics at a maximum concentration of 100 ppm. Patch testing has mainly been performed with a preparation of MCI/MI and MCI has been considered the primary sensitizer with cross-reactivity to MI. However, recent data show that MI is now the primary sensitizer in most cases.

Objectives: To study the number of additional cases with contact allergy to MI traced by testing with MI simultaneously with testing with MCI/MI.

Material and Method: During 2012, dermatitis patients at 5 Swedish dermatology departments were consecutively patch tested with MI 2000 ppm aq and MCI/MI 200 ppm aq.

Results: The number of additional cases with contact allergy to MI found when testing MI simultaneously with MCI/MI varied between 1.0-5.0% in the 5 centres. In total, 2.1% of the tested patients reacted only to MI and not to MCI/MI.

Conclusion: Due to the increase of contact allergy to MI not traced by MCI/MI, MI in water at 2000 ppm is included in the Swedish baseline series from January 2014.

## **ADDITION OF A METHOXYMETHYL SIDE CHAIN INTO P-PHENYLENEDIAMINE YIELDS 2-METHOXYMETHYL-P-PHENYLENEDIAMINE, A HAIR DYE WITH REDUCED SKIN SENSITIZING PROPERTIES**

Goebel, Carsten<sup>1</sup>; Troutman, John<sup>2</sup>; Hennen, Jennifer<sup>3</sup>; Rothe, Helga<sup>1</sup>; Schlatter, Harald<sup>1</sup>; Gerberick, G Frank<sup>2</sup>; Blömeke, Brunhilde<sup>3</sup>;

<sup>1</sup>Central Product Safety, Procter & Gamble, Darmstadt, Germany; <sup>2</sup>Central Product Safety, Procter & Gamble, Cincinnati, OH, United States; <sup>3</sup>Environmental Toxicology, Trier University, Trier, Germany. p-phenylenediamine (PPD) and p-toluylenediamine (PTD) are the most important hair dye primary intermediates for oxidative hair coloring and are regarded as the key drivers of hair dye allergy. Adding a methoxymethyl side chain to the PPD molecule yields the derivative 2-methoxy-methyl-pphenylenediamine

(ME-PPD) with reduced sensitizing properties compared to PPD and PTD. ME-PPD showed an attenuated innate immune response when analyzed for its protein reactivity and dendritic cell activation potential. In the local lymph node assay (LLNA) in mice, the concentration of ME-PPD 41

needed to induce lymphocyte proliferation 3-fold above background (EC3 value) was 4.3%, indicating a moderate skin sensitizing potency, whereas EC3 values of 0.1 and 0.17% correspond with an extreme to strong potency for PPD and PTD. Quantitative risk assessment (QRA) of the skin sensitizing potency of ME-PPD under hair dye usage conditions indicated an allergy induction risk negligible compared to PPD or PTD.

## **WHAT ARE THE PHYSICAL, FUNCTIONAL AND SOCIAL CONSEQUENCES OF LIVING WITH OCCUPATIONAL CONTACT DERMATITIS OF THE HAND?**

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Background and Objective: Studies using questionnaires have demonstrated the impact of occupational skin disease. The purpose of this study was to enrich our understanding of the physical, functional and social impact using qualitative techniques.

Methods : Following ethics approval, descriptive data was collected through six semi-structured interviews with patients with moderate to severe occupational contact dermatitis. Interviews were transcribed verbatim and coded using NVivo 8.0. Analyses focused on themes regarding physical impairment, activity limitation, and participation restriction, as well as personal and environmental factors that influence their condition and perception of disability.

Results: The most prominent themes were the chronic episodic nature of the disease, difficulty with self-care activities, self-management, "trial and error" strategies to manage the condition, coping with social isolation, inability to work, negative self-perceptions and perceived stigmas.

Conclusions: This study confirms that individuals with moderate to severe contact dermatitis experience severe disability which impacts physical function, daily activities and participation in work and social engagements. As a result, they suffer from physical and social isolation, and describe depressive moods. It also highlights their struggles with the disease and its management.

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## **METAL ALLERGEN RELEASE FROM US MOBILE DEVICES IS FREQUENT**

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As people around the world gain access to telecommunication devices such as cell phones, case reports have highlighted contact dermatitis due to mobile telecommunication devices.

Frequently the dermatitis is found to be an allergic contact dermatitis from metal allergens, notably nickel and cobalt. Assessment of nickel release from mobile devices has been documented in other countries, but not recently assessed in the United States. To assess current exposure to metal allergens, 50 mobile telecommunication were assessed for nickel and cobalt release using DMG and cobalt spot tests. 42% of mobile devices were found to release nickel from at least 1 component (21/50). No phones were found to release cobalt. While mobile devices continue to release nickel, metallic components may be smaller and the implications for mobile device ACD is not yet understood. In contrast to pervasive thinking that only cheap products release nickel, expensive smartphones, including Apple and Android products, also were found to release nickel in sufficient quantities to illicit ACD.

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### **ALLERGENS IN COSMETIC PEDIATRIC PRODUCTS MARKETED AS HYPOALLERGENIC, FRAGRANCE FREE, PARABEN FREE, AND DERMATOLOGIST RECOMMENDED**

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There is scant data published evaluating allergen content of pediatric cosmetics and the US Food and Drug Administration does not regulate the use of the term "hypoallergenic." 187 pediatric products, including lotions, soaps, shampoos, sunscreens and diaper creams, were purchased in and around Redlands, California in September 2013. Products advertised for the pediatric population that used the phrases "Hypoallergenic," "Dermatologist Recommended/ Tested," "Fragrance Free," or "Paraben Free" were identified and their ingredient lists photographed. Ingredients were compared to allergens in the North American Contact Dermatitis Group screening tray using a search algorithm programmed into Matlab software. 167(89%) of 187 products contained at least one contact allergen, 117(63%)  $\geq 2$  allergens and 21(11%)  $\geq 5$ . The average number of allergens in each product was 2.3. The most prevalent allergen was cocamidopropyl betaine, found in 45(24%), followed by propolis/beeswax 35(19%), phenoxyethanol 33(18%), tocopherol 25(13%), DMDM hydantoin 24(13%), and L. angustifolia oil 24(13%). By allergen type, preservatives 108(58%) and fragrances 55(29%) were most common. The ambiguous term "Fragrance" was listed as an ingredient in 102(54%). Methylisothiazolinone was found in 21(11%). Clinicians and patients should be aware of the discordance between these advertising terms and allergen content.

### **DEVELOPMENT AND FEASIBILITY TESTING OF A HAND DERMATITIS SCREENING TOOL IN HEALTHCARE: A PILOT STUDY**

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**Background and Objective:** Healthcare workers are at increased risk of developing occupational skin disease. Despite the proven effectiveness of prevention programs and early detection of dermatitis, most healthcare settings do not have screening programs. The objective of the study was to assess the feasibility of a dermatitis screening tool.

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**Methods:** Following ethics approval, a screening tool was developed and implemented in three settings in an acute care hospital: new employee orientation, Occupational Health Clinic, and staff on inpatient units. The tool combined self-report by the employee and visual inspection of the hands by experienced occupational health nurses or a trained clinical research assistant. Interviews with those who used the tool to gauge their perceptions of feasibility and effectiveness were conducted.

**Results:** Of 183 employees screened, 28% were found to have normal hands, 59% mild changes and 13% moderate to severe changes. The interviews revealed that the tool was easily and effectively implemented. It was quick to administer and employees responded positively.

**Conclusions:** Dermatitis screening tools may be easily implemented within healthcare settings and have the potential to educate employees about the risk of dermatitis and identify those at risk.

## **TOPICAL BLACK SALVE AND BLOODROOT IN DERMATOLOGIC CONDITIONS**

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Although black salve has no proven anticancer properties, extensive advertising of its effectiveness in recurring skin cancers and healing other skin ailments has led some patients to engage in self-treatment. Black salve often contains bloodroot, a known escharotic, and its application may damage healthy tissue, delay safer and proven efficacious treatment, result in recurrence or metastasis of cancer, and necessitate further treatment.

While other case reports have described the results of chronic black salve use, we describe a 35-year-old woman whose one-time application of black salve to the healing biopsy site of a compound nevus with moderate atypia to self-excise the lesion resulted in the formation of a dermatitic plaque with subsequent scarring and basal layer pigmentation. Natural remedies, which are touted to deliver health benefits, should be subject to standard drug regulations. Use of black salve should be discouraged because of the associated harmful effects and the availability of safer treatments. Dermatologists and other health professionals should be aware of this increasingly popular product to be able to better inform and treat their patients.

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## **A RETURN TO WORK PROGRAM FOR WORKERS WITH OCCUPATIONAL CONTACT DERMATITIS**

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**Background and Objective:** While there is information on return to work (RTW) outcomes and

disease factors that may influence RTW, there is little information available regarding programs designed for RTW for workers with occupational skin disease (OSD). The objective of the study was to describe the RTW program components, outcomes, barriers and facilitators to RTW for patients in Occupational Disease Specialty Program at St. Michael's Hospital.

Materials and Methods: Following ethics approval, 199 patients who had received return to work services for OSD were identified and their charts abstracted. Information collected included: demographics, diagnosis, return to work interventions, barriers and facilitators for RTW and outcomes. Descriptive statistics were used for the analysis.

Results: Common program components included: intensive worker education, case conferences and active follow-up, skin status monitoring and graduated RTW or a RTW trial. Barriers to RTW included: ongoing skin problems, difficulty following recommended skin care practices, ineffective prevention activities, lack of permanent modified work or the employer was not responsive to recommended accommodations. Facilitators included: availability of modified work, good communication between the workplace parties and worker compliance with the treatment plan.

Conclusions: A multifaceted program can assist with RTW.

Supported by a grant from the Ontario Workplace Safety and Board

## **LESSONS LEARNED IN OCCUPATIONAL DERMATOLOGY FROM AUSTRALIA**

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Objective: To discuss emerging trends and lessons learned during an occupational contact dermatitis mentorship elective in Australia.

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Methods: Three case vignettes of cutaneous allergy seen in the Occupational Dermatology Clinic in Melbourne, Australia will be presented.

Results: A 47-year old automotive emissions worker with hand dermatitis was patch test positive to methylchloroisothiazolinone/methylisothiazolinone (MCI/MI) and methylisothiazolinone (MI), found in a hand cleaner at work as well as in numerous personal care products. A 46 year-old endoscopy technician developed respiratory symptoms as well as an eruption on the hands within minutes of entering the endoscopy suite, and was found to be prick test (but not patch test) positive to chlorhexidine. A 31 year-old nuclear medicine technologist had severe atopic dermatitis on her body which cleared with conventional treatment, but her hand dermatitis persisted. Patch testing was positive for coconut diethanolamide in her hand cleanser at work.

Conclusions: 1) Contact dermatitis to MCI/MI and MI alone is found in numerous occupational and non-occupational exposures and has become increasingly relevant in Australia. The Australian Baseline Series has expanded to include methylisothiazolinone as an allergen on its own. 2) It is important to delineate between immediate and delayed hypersensitivity reactions, based on patient history. 3) Consider patch testing all atopics recalcitrant to treatment.

Acknowledgements: American Contact Dermatitis Society Mentoring Award, Canadian Dermatology Foundation Frederick Kalz Bursary

## **EXCITED SKIN SYNDROME TRIGGERED BY PATCH TESTING PROVIDES UNIFIED EXPLANATION**

## **FOR PALMAR ID REACTION FOLLOWING ALLERGIC CONTACT DERMATITIS AT THE SITE OF ACHILLES TENDON REPAIR**

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A 24 year-old man underwent Achilles tendon repair complicated by a failed skin graft and ulceration treated with topical neomycin and steroids. Subsequently, he developed a pruritic, scaly, and blistering eruption on both palms, and an eczematous eruption with vesicopustules around the ankle ulcer. Cultures from both ulcer and blister fluid were negative; oral doxycycline and terbinafine did not improve the eruption. Biopsy of the ankle rash showed spongiotic dermatitis. Patch testing to the NACDG 80 and steroid series (Chemotechnique) were: negative to neomycin and steroids, very positive to DMDM hydantoin, fragrance mix II, glutaraldehyde, Myroxolon pereirae, nickel sulfate, propylene glycol, and triclosan; and questionably positive to other allergens, indicative of the excited skin syndrome. Prednisone taper and clobetasol without propylene glycol markedly improved both palmar and ankle eruptions, and the ulcer started to close. To better define the relevant allergen(s), the patient is scheduled for repeat patch testing after the eruptions clear completely. Our case highlights: (1) 47

the importance of patch testing rather than blaming neomycin as the culprit allergen; (2) hyperimmunity proven by the excited skin syndrome as the explanation for the palmar id reaction; (3) repeat patch testing beyond the revved-up immune state as an integral component of management.

## **THE EFFECT OF PATCH TESTING FOR METAL SENSITIVITY IN THE PERIOPERATIVE SETTING ON ORTHOPEDIC SURGEON DECISION MAKING**

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Objectives: To understand the impact of patch testing for metal sensitivity in the perioperative setting on orthopedic surgeon decision making.

Methods: Questionnaires were sent to orthopedic surgeons involved in the care of patients who were referred to the UBC Contact Dermatitis Clinic from August 2009 to October 2013 to rule out a metal sensitivity in the perioperative setting. The questionnaires assessed whether the results of patch testing changed patient management, whether there were postoperative complications and if the patients' symptoms improved after adjustments were made in the setting of positive patch test results.

Results: Seventy percent of orthopaedic surgeons in the preoperative group and 75% in the postoperative group stated that the results of the patch testing influenced their management. Some of the ways that the results changed management included: using oxinium, titanium or ceramic joints, cancelling the surgery, and proceeding with a regular prosthesis in the setting of negative results.

Conclusions: Patch testing plays a significant role in the decision making process of orthopedic surgeons despite definitive evidence of the utility of patch testing in the perioperative setting.

This data will be used to conduct a randomized prospective trial in conjunction with orthopedic surgeons to investigate the role of patch testing in the perioperative setting.

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## **THE PYRETHRINS STEWARDSHIP PROGRAM: A PROSPECTIVE STUDY OF PYRETHRINS EXPOSURES**

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Reports of dermatitis and respiratory reactions associated with use of pyrethrins-containing products have appeared in the medical literature over the last century. The Pyrethrin Joint Venture, in consultation with USEPA, established the Pyrethrins Stewardship Program (PSP) to investigate consumer experiences from pyrethrins-containing pesticides. Self-reports of exposures have been obtained through public or contract poison centers. Of 907 incidents received during 2012, 363 incidents qualified for inclusion in the PSP. Of the various product types represented (crawling insect killer, pet care, etc.) none predominated and many contained other active ingredients. More than 75% of incidents featured exposures by the dermal and/or respiratory route. Over 75% of the exposed individuals were exposed as a result of unintentional exposures. Non-specific irritation to the skin and/or respiratory tract was the most commonly reported symptoms. Approximately 90% of exposed individuals claimed outcomes of minor severity; the remainders claimed moderate effects. No cases of major severity or deaths were reported. Of 363 eligible incidents, 19 individuals completed an Enhanced Questionnaire that probed circumstances of and results from exposure. Assistance with diagnostic patch and prick testing under physician's oversight has been offered, but no individual has chosen to participate. None of the data collected to date suggests that pyrethrins-containing products pose a significant risk of serious dermal or respiratory reactions.

### **ALLERGIC REACTIONS DUE TO ANTIGLAUCOMATICS**

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#### **Introduction**

Glaucoma is a chronic, progressive optic neuropathy, that can lead to visual field loss and blindness.

Allergic reactions to antiglaucoma eye drops is rare.

Patients and methods.

Authors present a retrospective analysis of 55 patients with suspicious allergy to topical antiglaucomatics. Each patient has been tested to individual products in serial dilutions (1-10-50% and as is). Allergy to vehicles / emulsifiers and preservatives has been examined by specific sets of Trolab® series. Three additional controls on healthy volunteers has been tested in case of each positive reaction to individual product. Diagnosis in all patients has been confirmed also by positive elimination test.

#### **Results**

8 of 55 patients (5 females and 3 males) revealed the positivity to one or more products. We detected of allergy to three different therapeutic subgroups in one patient and seven cases of sensitisation to one substance. Six patients has been positive to beta blockers (5x timolol nad 1x carteolol). Positive reaction to prostaglandine derivate " latanoprost has been detected in two patients. Carboanhydrase inhibitors (dorzolamide and brimzolamide) were positive in 2 cases. Allergy to preservative

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substance, benzalkoniumchloride, present in Cosopt® and Xalatan® eye drops, has been detected in

one case. The time to sensitisation was 2-24 months. Except for two positive reactions (++), all reactions were weak (+). One patient has been previously misdiagnosed by dermatologist.

#### Discussion

Antiglaucomatics are heterogenous group of drugs consisting of five active compounds: beta-blockers, cholinergics, alpha-2-adrenergic drugs, prostaglandin derivatives and carbo-anhydrase inhibitors. Only few small series and few case reports has been published to date. Our results had confirmed the fact, that beta blockers are most frequent reason for contact sensitisation. The proper diagnosis requires exclusion of allergy to additives, with special attention to benzalkonium chloride, most frequent preservative in eye drops. The problems concerning the diagnosis include unavailability of pure active substances for patch testing and high incidence of the weak and doubtful reactions. Allergenic potential of each subgroup and cross reactivity is discussed in this communication.

#### Conclusion.

Authors present 8 cases of allergy to three different groups of anti-glaucomatic drugs and one preservative. Our results confirmed the previous statement, that beta-blockers are most frequent source, followed by prostaglandine derivatives and carbo-anhydrase inhibitors. Allergy can developed several months after initial use. Cooperation with ophthalmologist is the important factor with respect to proper diagnosis.

### **CUMULATIVE IRRITATION TESTS OF COMMON PRESERVATIVES**

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Objective: We report the results of a large dataset of cumulative irritation tests (CIT) that were performed by JOHNSON & JOHNSON Consumer Companies, Inc. to evaluate the irritation potential of preservatives used in leave-on skin care formulations.

Methods: Preservatives were one component of test formulas studied in adults (18 to 70 years) with no known skin disease or allergies. Test formulas were applied to skin sites 6 times over 2 weeks using semi-occlusive patches. Sites were scored for irritation after each patch removal and reported as percentage of maximal possible score (%max score). The preservatives tested included: ethylenediaminetetraacetic acid (EDTA), diazolidinyl urea, DMDM hydantoin, parabens, isothiazolinone, phenoxyethanol, sorbates, or benzoates.

Results: Data were analyzed from 1,360 CIT studies on >45,000 subjects (n~30/per study). There were no significant differences between formulas containing different preservatives (P>0.1).

Median score across the entire dataset was 0.44 %max score, with most formulas showing no or mild irritation. Although seasonal variations were observed, no correlation was noted between score and preservative concentration.

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Conclusion: In a large normal subject dataset, preservatives did not appear to contribute to skin irritation. There was no association of CIT score with increasing preservative concentration, suggesting that any observed irritation responses were unlikely due to the preservative component of a formula.

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