Contact Dermatitis—Interesting Cases and Controversies

AAD Summer Meeting Boston, MA
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University of Mississippi Medical Center
Disclosures

I do not have any relevant relationships with industry regarding this discussion.

Patch Testing Materials May or May Not Be FDA Approved
Off Label Use Of Medications
Will Mention Brand Names
I Have Made Errors
OBJECTIVES

- Recognize common and newer allergens causing eczematous eruptions.
- Assess patients with eczematous eruptions who may or may not benefit from patch testing.
- Explain how relevant history may or may not determine the need for additional patch testing materials.
Among the diseases most frequently reported by nondermatologists, contact dermatitis was the most common (12.0%), with twice the number of visits to nondermatologists for contact dermatitis than to dermatologists (51.6 million vs 25.3 million).
I believe:

• Contact Dermatitis is “fun” ---Feel like Sherlock Holmes
• Osler said “Listen to the patient, he is telling you the diagnosis”
• Hindsight is 20/20 (I should have done more)
• It is right in front of our eyes many times but we have biases and miss it too often
• Who and Why should we patch test?
  - Is it obvious?
  - Children and Atopic Dermatitis
  - Two or Three for One--- “What Elses”

• Controversies or “Considerations/Questions”

• What to do after we Diagnose the problem
Who and Why should we patch test?
What should we use?
First Axiom of Contact Dermatitis

“It is very hard to find something if you are not looking for it.”

Joe Fowler

Dermatitis March/April 2015
North American Contact Dermatitis Group Patch Test Results for 2007–2008

Anthony F. Fransway, MD,* Kathryn A. Zug, MD,† Donald V. Belsito, MD,† Vincent A. DeLeo, MD,‡ Joseph F. Fowler, Jr, MD,§ Howard I. Maibach, MD,‖ James G. Marks, MD,‖ C.G. Toby Mathias, MD,** Melanie D. Pratt, MD,†† Robert L. Rietschel, MD,‡‡ Denis Sasseville, MD,§§ Frances J. Storrs, MD,¶¶ James S. Taylor, MD,||| Erin M. Warshaw, MD,*** Joel Dekoven, MD,††† and Matthew Zirwas, MD

Background: The North American Contact Dermatitis Group (NACDG) tests patients with suspected allergic contact dermatitis to a broad series of screening allergens and publishes periodic reports.

Objective: The aims of this study were to report the NACDG patch-testing results from January 1, 2007, to December 31, 2008, and to compare results to pooled test data from the previous 2 and 10 years to analyze trends in allergen sensitivity.

Methods and Materials: Standardized patch testing with 65 allergens was used at 13 centers in North America. $\chi^2$ analysis was used for comparisons.

Results: A total of 5085 patients were tested; 11.8% (598) had an occupationally related skin condition, and 65.3% (3319) had at least 1 allergic patch test reaction, which is identical to the NACDG data from 2005 to 2006. The top 15 most frequently positive allergens were nickel sulfate (19.5%), Myroxylon pereirae (11.0%), neomycin (10.1%), fragrance mix I (9.4%), quaternium-15 (8.6%), cobalt chloride (8.4%), bacitracin (7.9%), formaldehyde (7.7%), methylidibromoglutaronitrile/
North American Contact Dermatitis Group Patch Test Results: 2011–2012

Erin M. Warshaw, MD, MS, Howard I. Maibach, MD, James S. Taylor, MD, Denis Sasseville, MD, Joel G. DeKoven, MD, Matthew J. Zirwas, MD, Anthony F. Fransway, MD, C. G. Toby Mathias, MD, Kathryn A. Zug, MD, Vincent A. DeLeo, MD, Joseph F. Fowler, Jr, MD, James G. Marks, MD, Melanie D. Pratt, MD, Frances J. Storrs, MD, and Donald V. Belsito, MD

**Background:** Patch testing is an important diagnostic tool for assessment of allergic contact dermatitis (ACD).

**Objective:** This study documents the North American Contact Dermatitis Group (NACDG) patch-testing results from January 1, 2011, to December 31, 2012.

**Methods:** At 12 centers in North America, patients were tested in a standardized manner with a series of 70 allergens. Data were manually verified and entered into a central database. Descriptive frequencies were calculated, and trends were analyzed using \( \chi^2 \) statistics.

**Results:** Four thousand two hundred thirty-eight patients were tested; of these, 2705 patients (63.8%) had at least 1 positive reaction, and 2029 (48.0%) were ultimately determined to have a primary diagnosis of ACD. Four hundred eighty patients (9.6%) had occupationally related skin disease. There were 7532 positive allergic reactions. As compared with previous reporting periods (2009–2010 and 2000–2010), positive reaction rates statistically increased for 6 allergens: methylchloroisothiazolinone/methylisothiazolinone (5.0%; risk ratios [RRs] 2.01 [1.60–2.52], 1.87 [1.61–2.18]), lanolin alcohol (4.6%; RRs 1.83 [1.45–2.30], 2.10 [1.79–2.47]), cinnamic aldehyde (3.9%; 1.69 [1.32–2.15], 1.53 [1.28–1.82]).
NACDG 2011-2012

- 63.8% of patch tested patients had at least 1 positive reaction
  - 48% had a primary diagnosis of ACD rendered
  - 9.6% had occupationally related skin disease
- Increases and decreases noted
- Increases noted for:
  - MCI/MI (3.6 to 5%), Lanolin Alcohol, Cinnamic Aldehyde, Glutaral, Paraben Mix, and Fragrance Mix 1
Top 10 most frequent allergens - NACDG 2011-2012

**DERMATITIS, Vol 26 No 1 Jan/Feb, 2015** (4238 patients tested)

1. Nickel sulfate (18.5%)
2. Fragrance mix I (12.1%)
3. Neomycin (9.1%)
4. Myroxylon pereirae (7.9%)
5. Bacitracin (7.8%)
6. Cobalt chloride (7.3%)
7. Formaldehyde (6.6%)
8. Quaternium-15 (6.4%)
9. p-Phenylenediamine (6.3%)
10. Fragrance mix II (5.2%).
Cobalt Allergen of the Year 2016

• New Exposures noted
• Chemical spot test for cobalt now available

(nitrosonapthal 3,6 - disulfonylic acid disodium salt)
Recently recognized need to consider leather as a major site of cobalt

Cobalt
Joseph F. Fowler, Jr, MD

Cobalt has been a recognized allergen capable of causing contact dermatitis for decades. Why, therefore, has it been named 2016 “Allergen of the Year”? Simply put, new information has come to light in the last few years regarding potential sources of exposure to this metallic substance. In addition to reviewing some background on our previous understanding of cobalt exposures, this article will highlight the recently recognized need to consider leather as a major site of cobalt and the visual cues suggesting the presence of cobalt in jewelry. In addition, a chemical spot test for cobalt now allows us to better identify its presence in suspect materials.

Metals in general are the most common causes of allergic contact dermatitis (ACD). Nickel, gold, chromium, palladium, and cobalt all rank highly in lists of positive patch test reactions from studies around the world.\(^1\)\(^2\) Although cobalt has always been recognized as a common allergen, several new features of cobalt allergy have recently been elucidated (Table 1).

Cobalt (atomic number 27) is a shiny gray, magnetic, brittle metal, which in the earth, is often found with nickel and copper. Men to be allergic, and there was a 20% higher rate in atotics. This exhaustive review documented many sources of cobalt exposure. The most recent North American Contact Dermatitis Group data showed that 7.3% of 4231 patients reacted to cobalt.\(^2\)

Another fallacy was that cobalt allergy almost always occurs in concert with nickel allergy. In fact, this is not true, although some metal objects that contain cobalt may also contain nickel. North American Contact Dermatitis Group data indicated that 40% of patients positive...
COBALT --- ACDS ALLERGEN OF THE YEAR 2016

- Jewelry
- **Cement**
- Orthopedic and Other Implanted Devices
- Vitamin $B_{12}$
- Metals in Heavy Industry
- Paints
- Ceramics
- Tattoos (Azure blue, Cobaltous Aluminate)
- **Leather**

Shoe Allergic Contact Dermatitis
Erin Matthys, BS,* Amir Zahir, MD,† and Alison Ehrlich, MD, MHS‡

Foot dermatitis is a widespread condition, affecting men and women of all ages. Because of the location, this condition frequently due to contact with the rubber, either wearing rubber, or being in contact with the rubber. MEDLINE databases were used for the search, with a focus on literature updates from the last 10 years.

Historically, NO mention of COBALT IN LEATHER (Only mention in Buckles, Eyelets, Dyes, Pigment)

The prevalence of shoe allergic contact dermatitis (ACD) varies from 1.5% to 24.2% of patch-tested patients.1-4 The problem is found in both men and women, although there is some disagreement on the 23 received a final diagnosis of ACD; 30 patients were determined to have psoriasis.5
11. Methylchloroisothiazolinone/
    Methylisothiazolinone (5%)
12. Carba mix (4.7%)
13. Lanolin alcohol (Amerchol L 101) (4.6%)
14. Iodopropynyl butylcarbamate (4.2%)
15. Cinnamal (cinnamic aldehyde) (3.9%)
Almost 25% of patients had at least 1 relevant allergic reaction to a non-NACDG allergen (Special trays).

Up to 1/3 of reactions detected by NACDG allergens would have been missed by T.R.U.E TEST.
Missing in True Test™

Iodopropynyl butylcarbamate
Methylisothiazolinone
Fragrance Mix II
Cocamidopropyl betaine
Mixed Dialkylthioureas
Propylene glycol
American Contact Dermatitis Society Core Allergen Series

- Gold standard for evaluating allergic contact dermatitis
- Introduced by Jadassohn in 1895
- Sensitivity and Specificity are estimated at 70% to 80%
- Looked at <30, >60, 65 patches and supplemental series
- Final conclusion, “more is better”
American Contact Dermatitis Society Core Series 8 Panels 80 Allergens

American Contact Dermatitis Society CoreAllergen Series
Peter C. Schalock, MD, Cory A. Dunnick, MD
Susan Nedorost, MD, Bruce Brod, MD, § Erin Warshaw, MD, Christen Mowad, MD

DERMATITIS, Vol 24 No 1 January/February 2013
## Table 1: ACDS Recommended Allergen Series

### Core Allergen Panel I
- Nickel sulfate 2.5% pet*  
- Myroxylon pereirae 25% pet*  
- Fragrance mix I 8% pet*§  
- Quaternium 15 2% pet*  
- Neomycin 20% pet*  
- Budesonide 0.1% pet*  
- Formaldehyde 1% aq*§  
- Cobalt chloride 1% pet*§  
- p-tert-Butylphenol formaldehyde resin 1% pet*  
- p-Phenylenediamine 1% pet*  

### Core Allergen Panel II
- Potassium dichromate 0.25% pet*§  
- Carba mix 3% pet*§  
- Thiuram mix 1% pet*  
- Diazolidinyl urea 1% pet*  
- Paraben mix 12% pet*  
- Black rubber mix 0.6% pet*  
- Imidazolidinyl urea 2% pet*  
- Mercapto mix 1% pet*  
- Methylchloroisothiazolinone/methylisothiazolinone 100 ppm aq*  
- Tixocortol-21-pivalate 1% pet*  

### Core Allergen Panel III
- Mercaptobenzothiazole 1% pet*  
- Colophony 20% pet*  
- Epoxy resin 1% pet*  
- Ethylenediamine dihydrochloride 1% pet*  
- Lanolin alcohol (Amerchol 101) 50% pet  
- Benzocaine 5% pet†  
- Bacitracin 20% pet*  
- DMDM hydantoin 1% pet  
- Dibucaine 2.5% pet  
- Parthenolide 0.1% pet*  

### Core Allergen Panel IV
- 2-Bromo-2-nitropropane-1,3-diol 0.5% pet*  
- Lidocaine 15% pet  
- Gold sodium thiosulfate 2% pet*  
- Methyldibromoglutaronitrile 0.5% pet*  
- Disperse blue 106/124 mix 1.0% pet†*  
- Hydrocortisone-17-butyrate 1% pet*  
- Fragrance mix II 14% pet  
- Iodopropynyl butylcarbamate 0.1% pet§  
- Methylisothiazolinone 0.2% aq  
- Cocamidopropyl betaine 1% aq§  

### Core Allergen Panel V
Primary Irritant
- Harsh Chemicals (alkali, acids, soap, detergents)
- Water, solvents

Allergic
- T-cell mediated inflammatory response

Impetiginized Dermatitis
- S. aureus
Resistant “Eczema” in Child—
BUT, No Rash Elsewhere
3+ Balsam of Peru
3+ Fragrance
“After”
American Contact Dermatitis Meetings 2014-2016

- Not testing patients with Atopic Dermatitis frequently enough
- Not testing children in general enough
- Need to look at “hypoallergenic products” more closely
Conclusion –

Patients with a personal or family history of atopy have an increased risk of ACD

Atopic patients react to a greater number of allergens.

Provides further link between atopy and ACD
Data from 700 patch tested children

Positive patch test frequency was 61.8%
Relevant positive patch test frequency was 56.1%

Nickel 28.7/26.2
Cobalt Cl 12.3/8.7
Neomycin 7.2/6.6
Balsam of Peru 5.8/5.7
Fragrance Mix 5.3/5.0

ACDS Annual Mtg March 2014
Patch Testing in Children From 2005 to 2012: Results From the North American Contact Dermatitis Group

Kathryn A. Zug, MD;† Anh Khoa Pham, BSc;† Donald V. Belsito, MD;‡ Joel G. DeKoven, MD.§

By the time they published:
Up to 883 patients
Statistics about the same
But, 23.6% of children had a relevant positive reaction to at least 1 supplemental allergen
What can we do for Severe “resistant” Atopic Dermatitis

1) Prednisone
2) UVL
3) Methotrexate
4) Cyclosporine
5) Antibiotics
6) PATCH TESTS-----Listed as a Preventive Measure in Guidelines of Care-- Atopic Dermatitis JAAD 2014
Some Dermatologists Seeing More Patients With Allergic Contact Dermatitis Triggered By Skin-Care Products With Natural Ingredients.

In a 1,000-word article, the Wall Street Journal (4/18, D2, Mathews, Subscription Publication) reports that some dermatologists say they are seeing more patients with allergic contact dermatitis triggered by skin-care products with natural ingredients.

From the American Academy of Dermatology

Sign up to receive the AAD's Self-Assessment Question of the Week
FDA does not regulate what is “hypoallergenic”
187 products advertised as Hypoallergenic, Dermatologist Recommended/Tested, Fragrance Free, or Paraben Free were examined. 
89% contained at least 1 contact allergen
63% ≥ 2 allergens 
And 11% ≥ 5 allergens

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.
Nickel and Cobalt Testing
Have high index of suspicion when:

- Chronic, difficult to control atopic condition
- Localized or facial dermatitis, as this could indicate the point of contact with an allergen.
- Dermatitis that worsens, despite otherwise adequate treatment regimen.
Photo Contact Dermatitis

• Fragrances
  - Musk ambrette
  - Oil of Bergamot
  - Sandalwood Oil

• Plants
  - Lemon, Lime, Celery, Fennel, Parsley, Parsips

• Sunscreens
  - Benzophenones (Oxybenzone most frequent cause)
  - Avobenzone (Parsol1789, Butylmethoxydibenzoylmethane)
  - Cinnamates
Benzophenones—Contact allergen of the year 2014--to raise awareness of both allergy and photoallergy to these ubiquitous agents

- Initially--preservatives in industrial products such as paints, varnishes, and plastics to extend shelf life and reduce photodegradation
- 1950s--introduced into sunscreens
- chemical ultraviolet light absorbers
- primarily absorb light in the UV-B range (290-320 nm)
- benzophenone-3 (Oxybenzone) and benzophenone-4 (Sulisobenzone) also absorb UV-A II light (321-340 nm)
Benzophenone-3 (Oxybenzone)

- use in US sunscreens is more than all other benzophenones combined
- was found in 68% of the 201 sunscreens assessed in a 2011 study of known contact allergens in cosmetic and skin care products
Other Sunscreens

- **Avobenzone** NOT a Benzophenone (Parsol 1789)
- Photosensitizer in lip balms
- Octocrylene a UVL filter in cinnimate family used as a stabilizer for Avobenzone may actually cross react with Benzophenone 3 (Oxybenzone)
What to do after patch testing—as important as testing

- List allergens ---discussion very important
- List sites online
  - contactdermatitisinstitute.com/
  - http://www.cosmeticsdatabase.com
  - http://www.drugstore.com
- CAMP or CARD “safe products lists”
<table>
<thead>
<tr>
<th>CAMP- Contact Allergen Management Program</th>
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<tbody>
<tr>
<td>CARD-Contact Allergen Replacement Database</td>
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</table>

- 2-Bromo-2-Nitropropane-1,3-Diol (Bronopol)
- 4-Chloro-3-cresol
- Alpha-Isomethyl Ionone
- Ammonium Persulfate
- Avobenzone
- Balsam of Peru
- Benzalkonium Chloride
- Benzophenone-3
- Benzyl Alcohol
- Benzyl Salicylate
- Black Rubber Mix
- Budesonide
- Carba Mix
- Cetyl Alcohol
- Chlorhexidine Digluconate
- Cinnamic Alcohol
- 2-Hydroxyethyl Acrylate (HEMA)
- Abietic Acid (Abitol)
- Amerchol L101
- Amyl Cinnamal
- Azole Antifungals
- Beeswax
- Benzocaine
- Benzophenone-4
- Benzyl Benzoate
- BHA
- Botanicals
- Butylphenyl Methylpropional
- Carmine
- Cetyl Stearyl Alcohol
- Chloroxylenol
- Cinnamic Aldehyde
- 3-(Dimethylamino)propyl
- Aloe
- Amidoamine
- Amyl Cinnamal (Amyl Cinnamaldehyde)
- Bacitracin
- Bemotrizinol (Tinosorb S)
- Benzoic Acid and Benzoates
- Benzoyl Peroxide
- Benzyl Cinnamate
- BHT
- Bronopol
- Caine Mix
- Carvone
- Chamomile
- Cinnamal
- Cinnamyl Alcohol
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<tr>
<th>Category</th>
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<td>Acne/Rosacea Medications, Rx (42/76)</td>
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<td>Anesthetics, Rx (6/6)</td>
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<td>Anti-Aging/Anti-Wrinkle/Skin Firming Products (45/208)</td>
<td>Antibacterials, Rx (6/7)</td>
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<td>Antibiotics: Generic, selected Rx (12/14)</td>
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<td>Corticosteroids, Rx (78/98)</td>
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<td>Foot Care (7/14)</td>
<td>Eye Care: Contact Lens Products (18/23)</td>
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<tr>
<td>Hair: Conditioner (6/179)</td>
<td>Gloves: Non-Sterile (2/2)</td>
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<tr>
<td>Hair: Styling Products (7/343)</td>
<td>Hair: Eye (only) (5/16)</td>
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<td>Household: Bathroom, Kitchen &amp; All-Purpose Cleaners (1/17)</td>
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<td>Household: Hand Cleaners/Sanitizers (6/16)</td>
<td>Household: Laundry Additives/Fresheners/Softeners (5/43)</td>
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<td>Household: Surface Cleaners/Disinfectants (3/44)</td>
<td>Keratolytics, Rx (6/6)</td>
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<td>Make up: Eye; Other (11/13)</td>
<td>Make up: Eye; Liners (37/103)</td>
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<td>Make up: Face; Bronzer (19/25)</td>
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<td>Make up: Face; Blusher (27/44)</td>
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<td>Hair: Shampoo</td>
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<td>AMF SafeChoice Shampoo &amp; Body Wash (2014-Feb)</td>
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<td>AMF SafeChoice Shampoo &amp; Clean &amp; Simple Daily Shampoo (2013-Dec)</td>
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<td>Essence Skin-Saving Clark Essence Skin-Saving Wash Hair + Body &quot;Big Softie&quot;</td>
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<td>Superwash Hair + Body Milk Shampoo (info from VMV website) (2014-Apr)</td>
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<td>VMV Hypoallergenics VMV Hypoallergenics Psoriasis Medicated Shampoo &amp; Body</td>
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<td>Wash (2014-Feb)</td>
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<td>Shampoo Plus Conditioner (2013-Sep)</td>
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<td>Dermarest T/Sal Therapeutic Shampoo for Scalp Build-Up Control (2013-Oct)</td>
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<td>DHS Sal Shampoo (2013-May)</td>
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<td>DHS Fragrance Free Shampoo (Dec-2013)</td>
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<td>Shampoo for Sensitive Skin &amp; Scalp (2013-May)</td>
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<td>Free &amp; Clear</td>
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<td>Tarsus Shampoo/Gel (2014-Jan)</td>
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<td>Summers Labs</td>
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<td>Therapeutic Shampoo &amp; Body Wash (2013-May)</td>
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Volumizing Shampoo - SLS Free (Jun-2013)

Cleure

Hair: Styling Products
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<tr>
<th>Household: Dishwashing</th>
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<td>Dishwasher Pacs (7th Gen</td>
<td>Dishwasher Powder (7th Gen</td>
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<td>Earth Friendly/Ecos</td>
<td>7th Generation</td>
<td>Wave Automatic Free And</td>
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<tr>
<td>Free &amp; Clear Dishwasher Rinse Aid (7th Gen</td>
<td>Wave Gel Free &amp; Clear</td>
<td>Clear Dishwashing Detergent</td>
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<td>Website) (Nov-2013)</td>
<td>Automatic Dishwasher</td>
<td>Pods (2014-Feb)</td>
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<td>7th Generation</td>
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<th>Household: Hand Cleaners/Sanitizers</th>
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<tr>
<td>Micro-Bug&quot; Hand Gel (info from VMV website)</td>
<td>Sani-Hands Cloth Wipes</td>
<td>Sani-Hands</td>
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<tr>
<td>(2014-Apr)</td>
<td>(2014-Jan)</td>
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<tr>
<td>VMV Hypoallergenics</td>
<td>Sani-Hands</td>
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<tr>
<th>SANI-Kleen Instant Hand Sanitizer, Unscented (2014-Jan)</th>
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<tr>
<th>Moisturizers</th>
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Mobile Apps for CAMP and CARD

Welcome to the Contact Allergen Management Program (CAMP) System

Enter your search codes to login below:

XXX-XXX-XXX-XXX

XXX-XXX-XXX-XXX

Login

I agree to the terms and conditions below:

View Terms and Conditions

Searching by category:

Searching by manufacturer:

Search by name:
<table>
<thead>
<tr>
<th>Allergen Narrative List - English</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARITOL</td>
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<tr>
<td>ACRYLATE</td>
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<tr>
<td>AMIDOMINE</td>
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<tr>
<td>ANESTHETICS</td>
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<tr>
<td>AVOBENZONE</td>
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<tr>
<td>RACITRACIN</td>
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<tr>
<td>BALSAM OF PERU (Myroxylon)</td>
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<tr>
<td>BENZALKONIUM CHLORIDE</td>
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<tr>
<td>BENZOPHENONE 4</td>
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<tr>
<td>BENZYL ALCOHOL</td>
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<tr>
<td>BENZYL SALICYLATE</td>
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<td>BHA</td>
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<tr>
<td>BHT</td>
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<tr>
<td>BLACK RUBBER MIX</td>
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<tr>
<td>BRONOPOL (SEE FORMALDEHYDE)</td>
</tr>
<tr>
<td>BUDESONIDE (SEE CORTICOSTEROIDS)</td>
</tr>
<tr>
<td>CARBA MIX (SEE RUBBER ACCELERATORS)</td>
</tr>
<tr>
<td>CETEARYL ALCOHOL</td>
</tr>
<tr>
<td>CHLOROPHYLL A</td>
</tr>
</tbody>
</table>
RUBBER ACCELERATORS

What are these?
Rubber accelerators and antioxidants are chemicals used in the manufacture of both natural latex and synthetic rubbers. Many of these agents can cause allergic dermatitis. This type allergy is **different from** Latex Allergy, in which potentially dangerous **immediate** swelling occurs on contact with natural rubber made from latex tree sap.

Where might they be found?
- rubber gloves, nitrile gloves
- rubber sandals, slippers, soles
- rubber shoes, insoles, boots
- rubber hip waders, gators
- elastic in clothing, socks, girdle
- support stockings
- non-slip waistband, elastics
- brassiere cups
- rubber undergarments, panties
- slimming suits, sauna suits
- swimwear, swim cap, goggles
- wetsuit, diving gear
- condoms, diaphragms

kitchen utensil rubber handles
rubber mats, carpet backing or underlay pad
racquet handle, club handle
hockey pads, soccer shin pad, foam shoulder pad
rubber in upholstered furniture
rubber cement for shoe uppers and linings
rubber hose, rubber tubing, seals, cables
steering wheel, bicycle handle
auto hoses, gaskets, fan belts
shock absorbers, springs, tires, inner tubes
tool handles, utensil handles
duct tape, electrical cords
weather stripping
safety aprons, goggles, respirators, gas masks
neoprene and isoprene rubber
Non-rubber uses:
These chemicals have other uses that may be important in your exposure. Check the Material Safety Data Sheet (MSDS) at work for them.

Thiuram chemicals are used in germicides, pesticides, seed disinfectant, fungicides, insect repellants, animal repellants, wood and paint preservatives, plastics, putty, and as a bacteriostat in soaps, greases, shampoos, and oils. The medicine disulfiram (Antabuse) is a thiuram.

Carba chemicals are found in animal repellants, pesticides, herbicides, fungicides, slime retardants, disinfectants, and some shampoos, soaps, cements, sealants, and

Replace Rubber Items with these Alternatives:
Spandex  polyvinyl chloride  wood
silicone  buttons (for elastic)  acrylic
plastic  drawstrings (for elastic)  vinyl
fabric  polyethylene foam  Mylar

NOTE: Any socks or stockings worn with shoes that caused the allergic reaction may have gotten contaminated. Washing may not remove the allergen.

These are FREE of Rubber Accelerators:

Household gloves
- Best N-DEX NightHawk Defender (6)  800-241-0323
- Allerderm Heavy Duty Vinyl  800-365-6868

Exam gloves
- Ansell Micro-Touch Elite
- Symsation
- Conform NL
- New Touch
- Best N-DEX Free  800-241-0323
- Cardinal Health Esteem Stretchy Synthetic  800-234-8701

Sterile surgical gloves
Thioureas are present in diazo copy paper, photography fixative, polyvinyl chloride adhesive tapes, commercial paint and glue remover, acidic detergent, silver polish dip, disinfectants, pesticides, fungicides, phonecard thermocoating, metal anti-corrosion agent, stain remover, and manufacture of resin and Neoprene.

Benzothiazoles have uses in greases, cutting fluids, antifreeze, anticorrosives, cements, adhesives, detergents, veterinary products such as tick and flea powders and sprays, fungicides, slimicides, tree spray, photographic film emulsions, pottery molds and releasing fluid, and paints.

Chemical protective gloves
- Barrier Chemical Protective www.ansellpro.com 800-800-0444

Condoms
- Trojan Naturalamb
- Durex Avanti polyurethane

Diapers
- Luvs
- Pampers

Underwear—with no elastic waist, leg bands, straps
- Jockey
- Dorlastan
- Spandex (many brands)

Socks—with no elastic component

Shoes—completely leather with non-rubber sole and insole (e.g. cork, felt)

Sports equipment free of Neoprene—Cropper Medical, Ashland, OR; Bauerfiend USA, Wichita, KS; Speedo, Los Angeles, CA; TYR Sport, Huntington, CA; Skyline Northwest, Lake Oswego, OR; Shock Doctor, Plymouth, MN; McKeon Products, Warren, MI; E.A.R. Inc., Boulder, CO; All-Star Sports Equipment, Shirley, MA
Cognitive Errors

Resist “Closed Discussions” controlled by EMR defaults or structure

• Only fill in the blanks

• Doctors very frequently cut off patients midsentence (Any guesses?) (18 seconds average)*

• May need to really “dig into” history.

Diagnosis?

A. Dyshidrotic eczema
B. Psoriasis
C. Allergic contact dermatitis
D. Acrodermatitis continua of Hallopeau
E. Darier’s disease
Nickel and Rubber Allergy DMGO Test
What does he have?

A. Irritant contact dermatitis
B. Allergic contact dermatitis
C. Impetigo
D. Psoriasis
E. Acrodermatitis of Hallopeau
Main causes of dermatitis in HCW’s

A. Latex allergens
B. Preservatives
C. Rubber accelerators
D. Soap and water
E. Fragrances
F. Dyes in gloves

Holness DL, Mace SR Am J Contact Dermat 2001
Callahan BA et al. Dermatitis 2013
Suneja T, Belsito D Contact Dermat 2008
Suneja T, Belsito, DV Occupational dermatoses in health care workers evaluated for suspected allergic contact dermatitis.

HCWs statistically more likely than non-HCWS to be female, have hand dermatitis, and have a hx of atopy.

HCWs more likely to have work-related ACD

1. Quaternium-15
2. Thiuram
3. Carba mix
4. Glutaraldehyde
5. Benzalkonium chloride,
6. AND to have Allergic Contact Urticaria to latex

“Occupational contact allergy caused by rubber gloves---nothing has changed.”

Geier J; Lessmann H; Mahler V; Pohrt U; Uter W; Schnuch. Contact Dermatitis 2012 Sep;67(3):149-56

Retrospective analysis of data -- the Information Network of Departments of Dermatology (IVDK), 2002-2010.
(Previously 1995-2001)

93,615 pts patch tested --- 3448 suffered from occupational dermatitis and were tested because of suspected glove allergy.

Among these, healthcare workers were the largest group (n = 1058).
Of ALL occupational dermatitis patients

13% were sensitized to Thiurams
3.5% to Dithiocarbamates
3.0% to 1,3-diphenylguanidine (carbamate too)
3.0% to Mercaptobenzothiazole and/or its derivatives
0.4% to Thioureas

“Latex” being replaced
46-year-old man with 6-7 yr hx eczematous eruption on dorsal feet

• Patient wore leather oxford shoes to work for 18 years
• Limited improvement with several different corticosteroid creams
Patch Test Results

• Positive to Potassium Dichromate
• Positive to his work shoes
Still active—not really clearing

Switched shoes / Using Amcinonide cream
Patch tests showing positive reactions to emulsifying wax (1) and amcinonide (5).

<table>
<thead>
<tr>
<th>Structural class</th>
<th>Hydrocortisone type</th>
<th>Class A:</th>
<th>Class B:</th>
<th>Class C:</th>
<th>Class D1:</th>
<th>Class D2:</th>
</tr>
</thead>
<tbody>
<tr>
<td>No substitutions</td>
<td>C16,17-cis-diol</td>
<td>Budesonide</td>
<td>C16 methyl substitution</td>
<td>C16 No methyl substitution</td>
<td>C16-21-long chain ester</td>
<td>C16-21-long chain ester</td>
</tr>
<tr>
<td>in the D ring, except C21 short-chain esters</td>
<td>or ketal</td>
<td></td>
<td>C17/C21-long chain ester</td>
<td>C17-21-long chain ester</td>
<td>C21-possible side chain</td>
<td>C21-possible side chain</td>
</tr>
<tr>
<td>Cross-reaction</td>
<td>Cross-reacts with D2</td>
<td>Budesonide</td>
<td>Tramcinolone acetonide</td>
<td>Budesonide</td>
<td>Hydrocortisone-17-butyrate</td>
<td>Budesonide</td>
</tr>
<tr>
<td>Tixocortol-21-pivalate</td>
<td>Budesonide</td>
<td>Tramcinolone acetonide</td>
<td></td>
<td></td>
<td></td>
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</table>

**Class 1: Superpotent**

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<tr>
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<th>Hydrocortisone type</th>
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<td>Budesonide</td>
<td>Tramcinolone acetonide</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Class 2: Potent**

<table>
<thead>
<tr>
<th>Structure</th>
<th>Hydrocortisone type</th>
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<th>Class B:</th>
<th>Class C:</th>
<th>Class D1:</th>
<th>Class D2:</th>
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<td>Tramcinolone acetonide</td>
<td></td>
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<td></td>
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</table>

**Class 3: Upper mid-strength**

<table>
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<tr>
<th>Structure</th>
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<th>Class B:</th>
<th>Class C:</th>
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<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Structural class</th>
<th>Class A: Hydrocortisone type</th>
<th>Class B: Triamcinolone acetonide type</th>
<th>Class C: Betamethasone type</th>
<th>Class D1: Betamethasone dipropionate type</th>
<th>Class D2: Methylprednisolone acetonide type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 4 Mid-strength</td>
<td>Aminonide (Cyclomac 0.1% C)</td>
<td>Clocortolone pivalate (Clocort 0.1% C)</td>
<td>Desoximetasone (Topicort 0.05% emollient cream)</td>
<td>Mometasone furoate (Bocor 0.1% O)</td>
<td>Hydrocortisone valerate (Westcort 0.2% O)</td>
</tr>
<tr>
<td></td>
<td>Flucinolone acetonide (Derma-Smooth 0.01%, Synalar 0.25% O)</td>
<td>Haldinonide (Halog 0.025%, C)</td>
<td>Triamcinolone acetonide (Aristocort, Kenalog, Triacet 0.1%, O)</td>
<td>Clobetasone butyrate (Eumovate 0.05%)</td>
<td></td>
</tr>
<tr>
<td>Class 5 Lower mid-strength</td>
<td>Desonide (DesOwen, Tridesil 0.05% O)</td>
<td>Flucinolone acetonide (Derma-Smooth, Synalar 0.025% Q)</td>
<td>Triamcinolone acetonide (Aristocort, Kenalog 0.1% C, Kenalog 0.025% O, L)</td>
<td>Betamethasone dipropionate (Diprosone, Maxivate 0.05% L)</td>
<td>Hydrocortisone butyrate (Locoid 0.1% C, O, S)</td>
</tr>
<tr>
<td></td>
<td>Flucinolone acetonide (Derma-Smooth, Synalar 0.025% Q)</td>
<td>Triamcinolone acetonide (Aristocort, Kenalog 0.1% C, Kenalog 0.025% O, L)</td>
<td>Triamcinolone diacetate (Aristocort, Aristocort 0.1% C)</td>
<td>Betamethasone valerate (Betatrex, Valisone C, L)</td>
<td>Hydrocortisone butyrate (Locoid 0.1% C, O, S)</td>
</tr>
<tr>
<td>Class 6 Mild</td>
<td>Desonide (DesOwen, Tridesil 0.05% O)</td>
<td>Flucinolone acetonide (Derma-Smooth, Synalar 0.025% Q)</td>
<td>Triamcinolone acetonide (Aristocort, Kenalog 0.025% Q)</td>
<td>Alkametasone dipropionate (Acloliate 0.05% C, O)</td>
<td>Prednicarbate (Dermatop 0.1% Q)</td>
</tr>
</tbody>
</table>

Up to 30% corticosteroid allergy can be missed if late reading not done


3. Isaksson M, Bruze M. Late patch-test reactions to budesonide need not be a sign of sensitization induced by the test procedure. Am J Contact Dermat 2003;14(3):154-156.

Delayed Patch Test Reading

12.8% by checking at 7 days as opposed to just 3 to 5 days

7 to 14 % may be missed

What do these 3 have in common?
Allergic Contact Dermatitis

Hair dye---
para-phenylenediamine
black dye
permanent type

Usually more pronounced on the face, ears, and neck than the scalp.
Hairdresser: Dx and “what else?”
Consider Psoriasis too
ACD, Psoriasis and What Else?

• Wearing Gloves
  - ALL the time at work
  - Vinyl gloves
  - Protection from Dyes
Which gloves “protect” — PPD

A. Vinyl gloves  
B. Natural latex rubber  
C. Polyethylene  
D. Nitrile  
E. A and C
Are Gloves Sufficiently Protective When Hairdressers Are Exposed to Permanent Hair Dyes? An In Vivo Study

Contact Derm 2014 Nov 19;[Epub Ahead of Print], A Antelmi, E Young, C Svedman, E Zimersson, M Engfeldt, C Foti, M Bruze
Eczematous reactions were found:
- Natural rubber latex
- Polyethylene
- Vinyl gloves were tested with the dye (PPD sensitized volunteers)

- Nitrile gloves gave good protection, even after 60 min of exposure to the hair dye.

A Antelmi, E Young, C Svedman, E Zimersson, M Engfeldt, C Foti, M Bruze. Are Gloves Sufficiently Protective When Hairdressers Are Exposed to Permanent Hair Dyes? An In Vivo Study. Contact Derm 2014
Hairdresser/Salon Owner

ACD, Psoriasis and Proper Gloves and Use
Methylisothiazolinone: American Contact Dermatitis Society Allergen of the Year 2013

Iodopropynyl butylcarbamate (preservative) also noted!
American Contact Dermatitis Allergen of the Year 2013:

Methylisothiazolinone