Occupational Dermatology

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Pliny the Younger
1st Century AD
Skin disease comprises up to 40% of notified occupational disease across Europe (but there is significant under-reporting)

Contact dermatitis, contact urticaria, skin cancer

Rates of occupational dermatitis 0.5 to 1.9 cases per 1000 full-time workers p.a.

Within the EU, costs of occupational eczema (treatment, sick leave, loss of productivity) exceeds €5bn annually
Contact Dermatitis: irritant and allergic

CAUSES OF CONTACT DERMATITIS

- Soaps and cleaners
- Wet work
- Personal protective equipment
- Rubber
- Nickel
- Petroleum products
- Solvents and alcohols
- Cutting oils and coolants
- Epoxy and other resins
- Aldehydes
- Non-epoxy glues and paints
- Other
Irritant Contact Dermatitis

› Commonest causes of occupational irritant contact dermatitis
  - soaps, wet work, petroleum products, cutting oils and coolants
Irritant Contact Dermatitis
Strimming dermatitis – phytophotodermatitis (photocontact dermatitis)

Lime juice has the same effect:
Irritant Contact Dermatitis

Skincare principles in the workplace
- Luke-warm water for washing
- Use correct gloves before exposure
- Remove rings where possible
- Cotton liners under protective gloves
- Avoid disinfectant hand cleansers
- Apply emollient hand creams
- Protect hands at home
- Workforce education
Healthy Skin@Work

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CAMPAIGN: HEALTHY SKIN@WORK
Allergic Contact Dermatitis

› Less common than irritant contact dermatitis
› Patch testing: baseline and extended series along with workplace products

Benzoisothiazolinone allergy
Patch testing

**Day 0**

BSCA Standard series

Extended series:
- Bakery
- Dental
- Epoxy
- Hairdressing
- Isocyanate
- (Meth)acrylate
- Oils and coolants
- Plant
- Plastic and glues
- Rubber additives
- and more...

**Day 4**
1 potassium dichromate
2 neomycin sulphate
3 thiuram mix
4 p-phenylenediamine
5 cobalt chloride
6 caine mix III
7 formaldehyde
8 colophony
9 quinoline mix
10 Myroxylon pereirae (Balsam of Peru)
11 N-isopropyl-N-phenyl-4-phenylenediamine
12 lanolin alcohol
13 mercapto mix
14 epoxy resin
15 parabens mix
16 p-tert-butylphenol formaldehyde resin
17 fragrance mix I
18 quaternium 15
19 nickel sulphate
20 methylchloro & methyl isothiazolinone
21 mercaptobenzothiazole
22 amerchol L101
23 sesquiterpene lactone mix
24 p-chloro-m-Cresol
25 2-bromo-2-nitropropane-1,3-diol
26 Cetearyl alcohol
27 sodium fusidate
28 tixocortol-21-pivalate
29 budesonide
30 imidazolidinyl urea
31 diazolidinyl urea
32 methyldibromoglutaronitrile
33 Tree Moss
34 p-chloro-meta-xylenol
35 carba mix
36 disperse Blue mix 106/124
37 fragrance mix II
38 Lyral
39 Compositae Mix
40 methylisothiazolinone
41 sodium metabisulphite
42 Linalool
43 Limonene
44 hydroxyethylmethacrylate
Allergy to chromate in leather gloves
Allergy to rubber accelerators (thiurams)
Garlic allergy in a chef
Hand dermatitis in hairdresser
Occupational nickel allergy in cashier
Primula dermatitis in a gardener
Recent Advances in Occupational Dermatology: New allergens

› Isothiazolinones

- Benzoisothiazolinone and octylisothiazolinone important allergens in leather (one cause of sofa dermatitis)

- Methylisothiazolinone allergy now a worldwide epidemic (cosmetics, wet wipes, sunscreen, shaving products, deodorants, detergents, paints, glues, mattress covers, ultrasound gel, water beds...)

• Variety of presentations (including systemic reactions following inhalation)
• Latex gloves not always protective against penetration of isothiazolinones
• Still significant levels of MCI/MI in some EU countries and other parts of the world

Airborne allergic contact dermatitis due to methylisothiazolinone in paints
Recent Advances in Occupational Dermatology: New allergens

› Polyaminopropyl biguanide (aka polyhexanide, polyhexamethylene biguanide)
  - Used in contact lens industry
  - Now found in antiseptics, disinfectants, cosmetics
  - Can cause immediate- and delayed-type hypersensitivity
  - Partial cross-sensitivity with chlorhexidine (another biguanide)
Recent Advances in Occupational Dermatology: New allergens

› Ethylhexylglycerin

› C12-15 alkyl benzoate
  – Antibacterial properties, present in cosmetics, not classified as preservatives under current regulations.

› Caprylhydroxamic acid
  – Chelating agent, caused an epidemic of contact dermatitis in Finland when used in a moisturizer.
Recent Advances in Occupational Dermatology: New allergens

› Rubber derivatives
  – Diphenylguanidine – accelerator (carbamate)
    › Found in nitrile gloves

  – DMTBS (dimethylthiocarbamylbenzothiazole sulphide)
   › Strongly sensitizing chemical formed during vulcanization, related to thierams
Recent Advances in Occupational Dermatology: New allergens

› Epoxys
  - Bisphenol A-type – baseline series
  - Bisphenol F-type
  - Alkyl glycidylethers
    › Aircraft and helicopter construction; more than 60% of cases of epoxy allergy missed in a recent Canadian Study of epoxy allergy in aircraft industry without testing to workplace products
    › 3D printing (along with acrylics)
Recent Advances in Occupational Dermatology: New allergens

› Acrylates
  – Isobornyl acrylate
    › Glucose sensors
  – Cyanoacrylates
    › Glucose sensors, false eyelashes, surgical and instant glues, nail cosmetics
  – Methacrylates
    › Can lead to severe nail dystrophy
Dermatitis in a nail technician
Recent Advances in Occupational Dermatology: New allergens

› Fragrances
  – Cinnamic alcohol cross-reacting with ketoprofen
    › Systemic contact dermatitis can occur after consumption (e.g. herbal tea)
  – Many unlabeled fragrances
    › E.g. toothpastes – menthol, carvone, peppermint oil etc
    › Linalyl acetate in hospital antiseptic – oxidized to linalool

› Terpenes
  › Limonene, linalool, found in all essential oils, tea-tree oil, propolis, spices, compositae plants, colophony.
Contact Dermatitis

› Outlook for occupational contact dermatitis is relatively poor:
  – 55% still had disease 2 years after diagnosis
  – Of those staying in same job 68% remain symptomatic
  – 37% of those who moved to different work environment remain symptomatic
  – 25% who moved jobs still had similar chemical exposures
  – 11.5% had persistent disease in absence of any obvious cause (‘persistent post-occupational dermatitis’)

Contact Urticaria
(syn: protein contact dermatitis)

› Pruritus and wheal and flare reaction

› Develops within 60 mins of exposure and resolves within 24 hours. Systemic symptoms can occur in immunologically-mediated reactions
RELATIVE RISK OF DEVELOPING CONTACT URTICARIA

- Nurses
- Restaurant workers
- Laboratory assistants
- Painters
- Chefs
- Medical personnel
- Plastics workers
- Butchers
- Agricultural workers
- Bakers

Relative risk (%)

0  5  10  15
Latex allergy

› Reaction is to the protein content
› Subgroup of patients also react to other plant proteins: banana, avocado, chestnuts, kiwis and other fruits
› Powdered latex gloves risk disseminating latex protein and are no longer used in the healthcare setting
Recent multinational consensus document (2017) addressing unmet needs relating to occupational skin disease, with recommendations for notification, early diagnosis, management and product labelling.
An occasional occupational dermatosis in dermatologists
Occupational Dermatology at JCB

› Monthly Clinics at JCB since 2011

– Referrals via Occupational Health Team

– Self referrals

– Mole-mapping images
    › Executive screening and self-referrals
Inflammatory Dermatoses
169 cases

- Allergic contact dermatitis: 18%
- Irritant contact dermatitis: 10%
- Psoriasis: 9%
- Atopic dermatitis: 8%
- Tinea: 8%
- Dermatitis NOS: 11%
- Pompholyx: 6%
- Urticaria: 5%
- Misc: 25%
Dermatitis

- Allergic contact dermatitis
- Irritant contact dermatitis
- Atopic dermatitis
- Seborrhoeic dermatitis
- Discoid eczema
- Pompholyx
- Dermatitis NOS
- Gravitational dermatitis
- Phytophotodermatitis
- Irritant contact dermatitis
- Allergic contact dermatitis
Culprit allergens

- isothiazolinones: 17%
- fragrance: 11%
- coconut diethanolamide: 9%
- carbamates: 6%
- formaldehyde: 7%
- methacrylate: 7%
- misc: 43%

(All percentages are approximate.)
Lesions
120 cases

- Melanocytic naevi: 43%
- Seborrhoeic keratoses: 18%
- Dermatofibroma: 11%
- Actinic keratosis: 8%
- Melanoma: 5%
- Basal Cell Carcinoma: 4%
- Misc: 11%
- Melanoma: 4%
Mole-mapping
Miscellaneous inflammatory dermatoses:

dermographism
erysipelas
erythema multiforme
exanthem
exfoliative keratolysis
folliculitis / **furunculosis**
granuloma annulare
gravitational dermatitis
hidradenitis suppurativa
keratoderma
lichen planus
palmar plantar pustulosis
paronychia

pemphigoid
phytophotodermatitis
pigmented purpuric dermatosis
pitted keratolysis
pityriasis rosea
pityriasis rubra pilaris
pityriasis versicolor
polymorphic light eruption
prurigo
rosacea
urticaria pigmentosa
urticarial vasculitis
urticated erythema
Furunculosis?
Furuncular myiasis - Botfly larvae