# Occupational Contact Dermatitis

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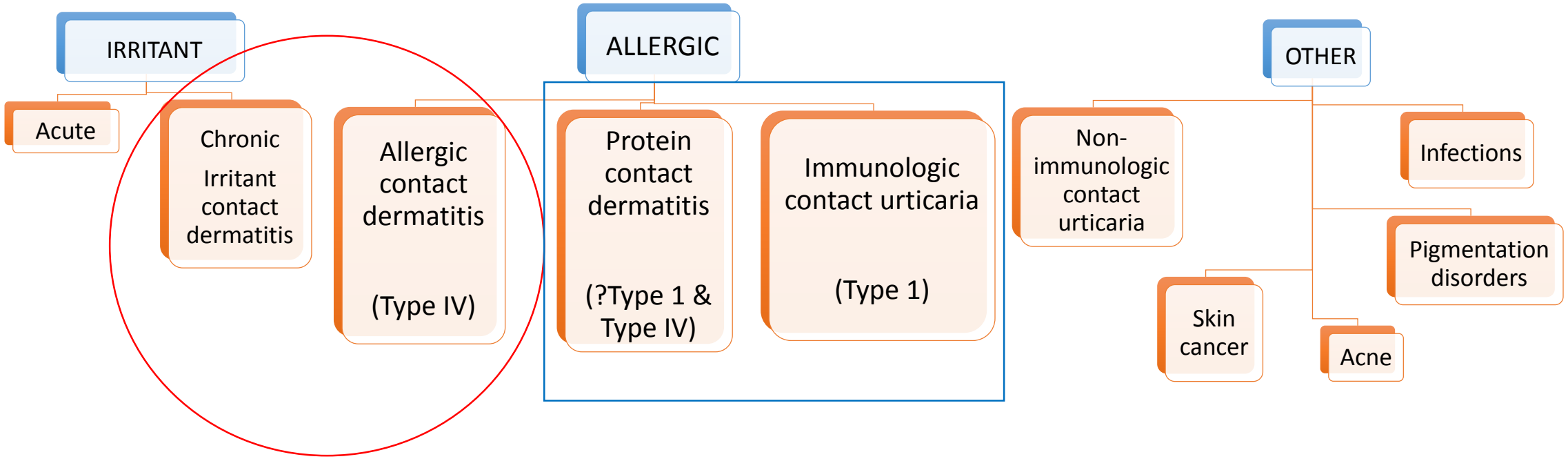
# Overview

- Common occupational skin diseases
- Evaluating a patient with possible occupational skin disease
- Managing occupational skin disease
  - Treatment
  - Referral

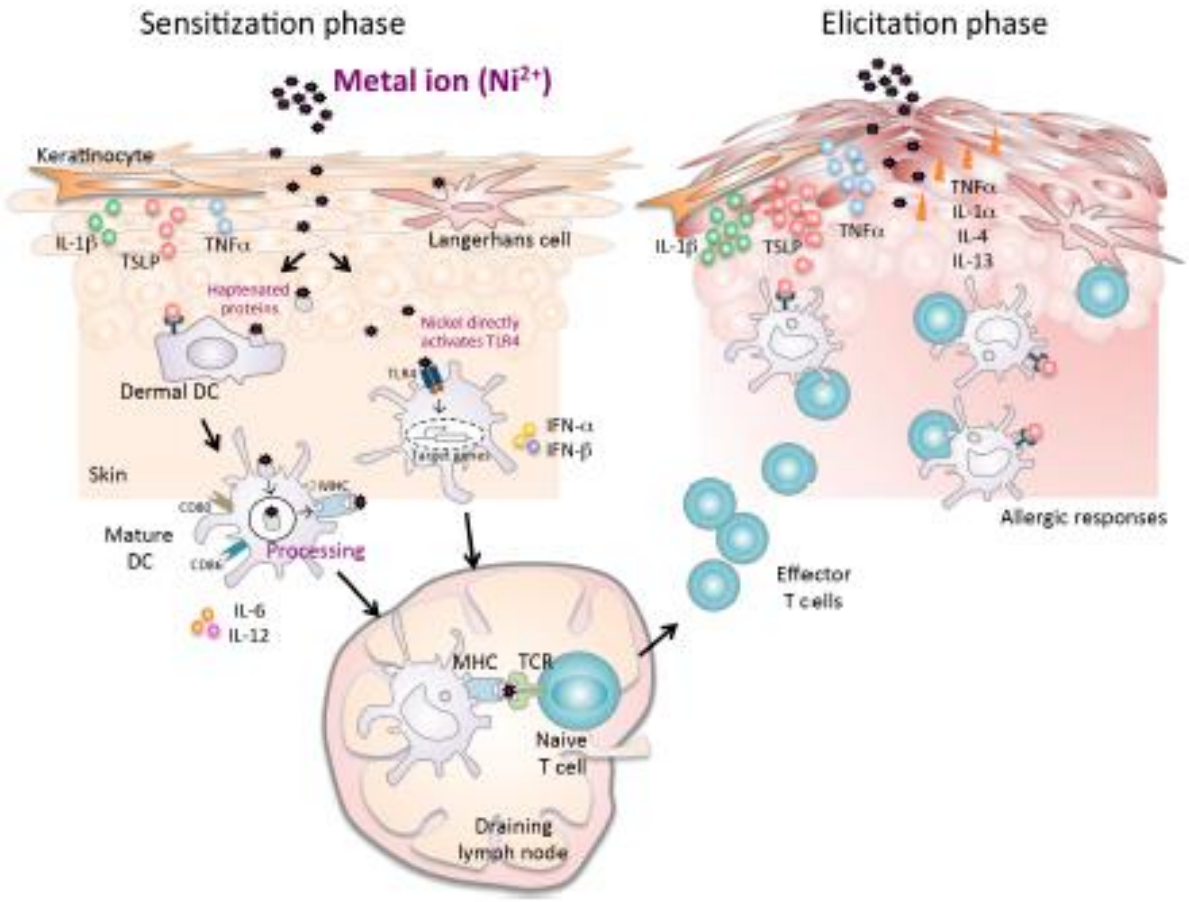
# Occupational skin disease



# Pathophysiology allergic contact dermatitis: Type IV hypersensitivity

Small haptens penetrate the skin. Initiate production of pro-inflammatory cytokines and chemokines

Hapten presented on Major Histocompatibility Complex to naïve T-cell




Re-exposure to same haptens results in activation of hapten-specific T cells in the skin

Inflammation leading to characteristic skin lesions

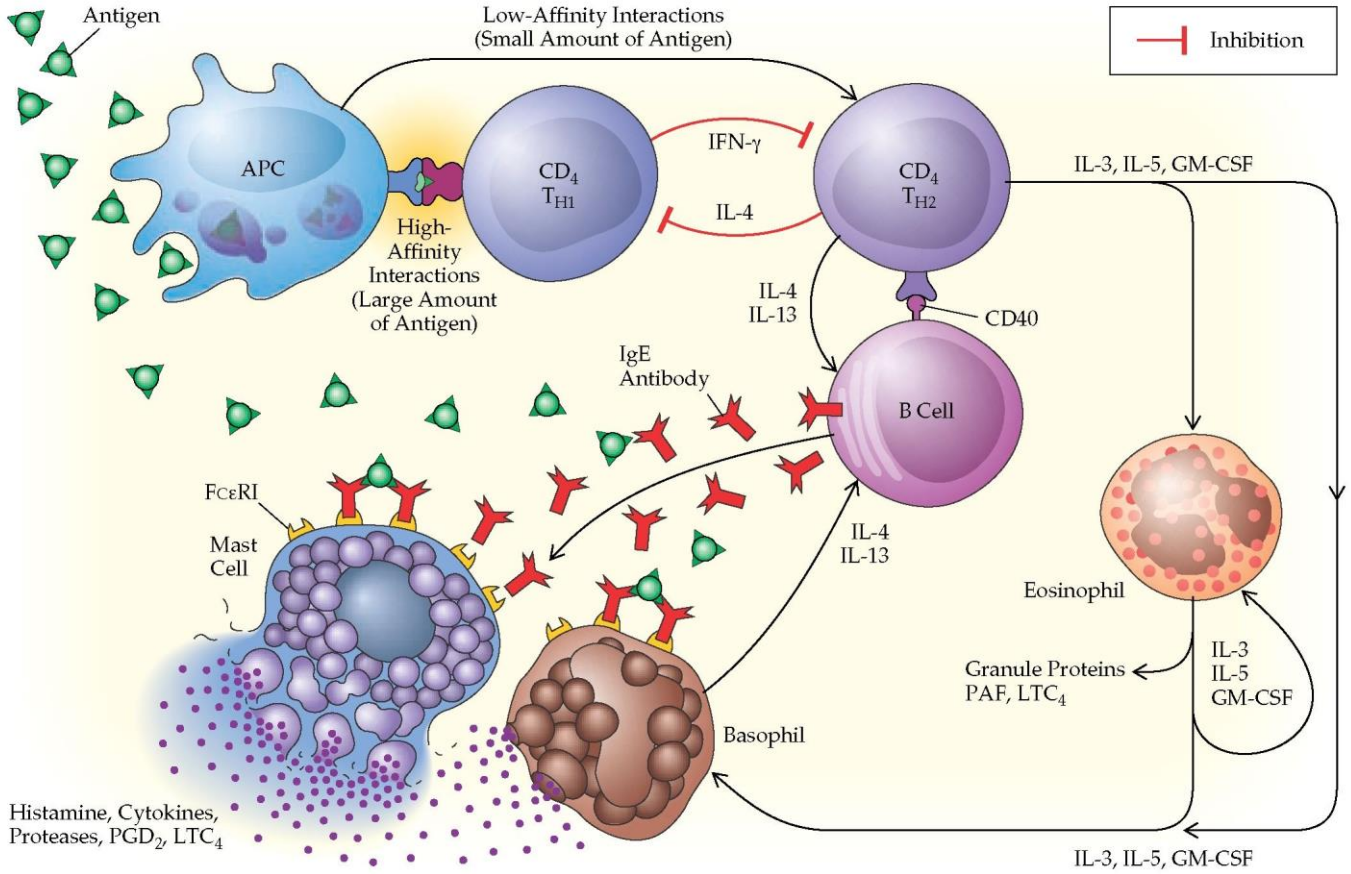
**Patch test for delayed hypersensitivity**

Source: Saito et al, 2016

# Pathophysiology contact urticaria syndrome: Type I hypersensitivity

Allergen exposure leads to production of specific IgE

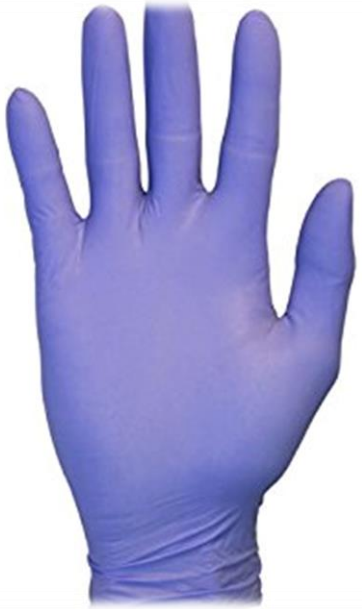
Subsequent exposures result in degranulation of mast cells with release of histamine, cytokines etc.




**Skin prick tests**
**Prick prick tests**
**Specific IgE**

# High risk occupations for occupational contact dermatitis

# Common allergens



# Common irritant exposures at work

- Wet work
- Frequent hand washing
- Use of occlusive gloves
- Exposure to soaps/alkalis
- Exposure to acids
- Exposure to solvents
- Mechanical irritation (friction)

# Evaluating a patient with possible occupational dermatitis

# Step 1: Personal and occupational history

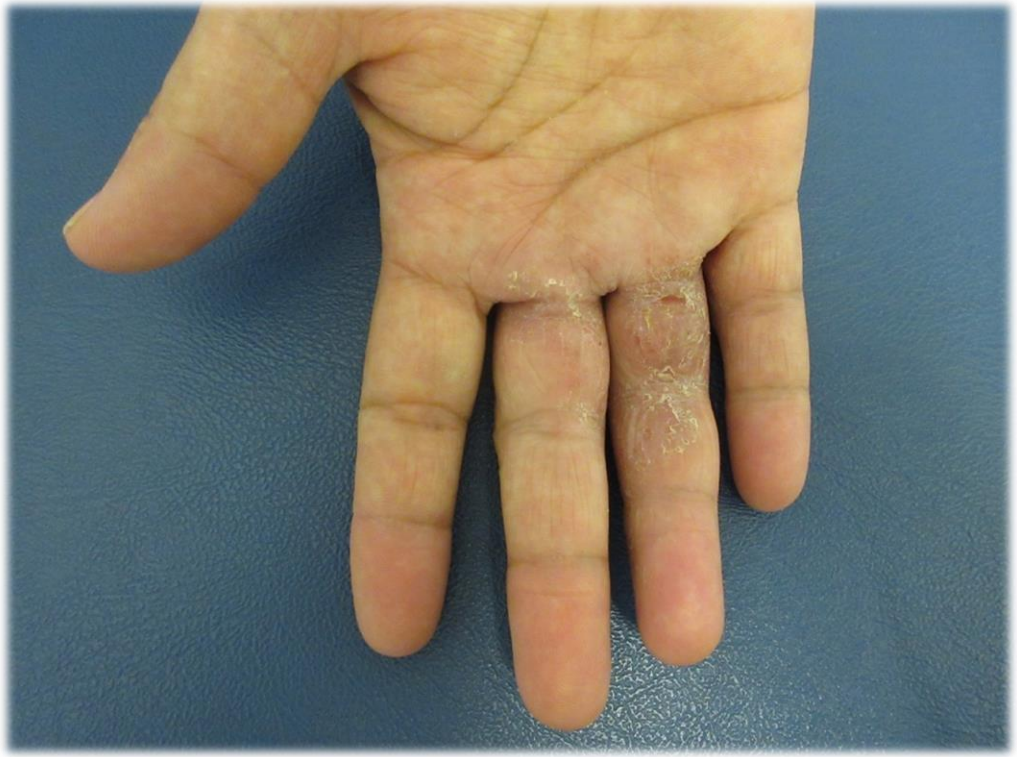
- Pre-existing skin or atopic conditions
- When did symptoms start? How does rash present? Associated Type 1 allergy symptoms?
- Does condition improve with time away from work, and worsen on return to work?
- Other exposures (hobbies, second job, household chores etc)

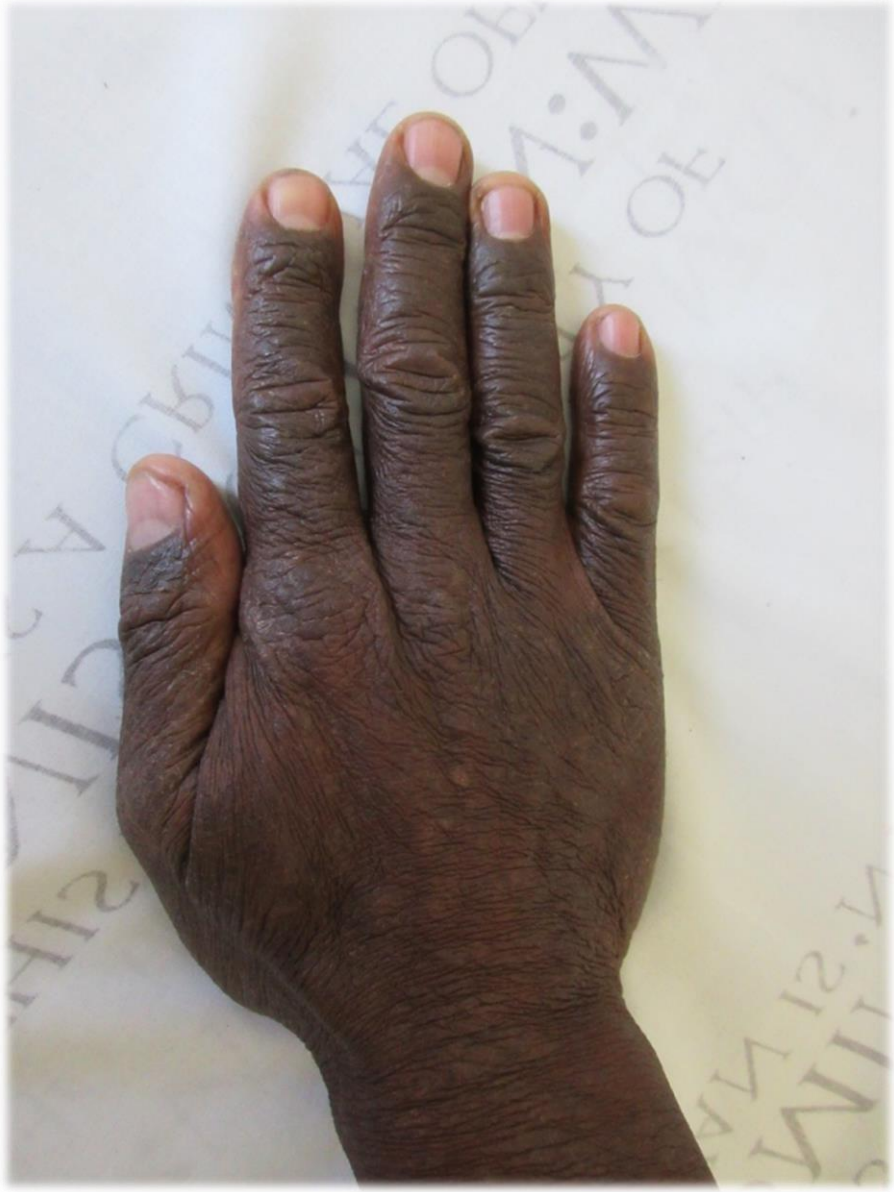
# Occupational history

- Important to obtain detailed description of tasks
- Ascertain presence of chemical hazards, particularly known allergens
- Consider presence of irritants in the workplace:
  - Wet work
  - Occlusive gloves
  - Frequent handwashing
  - Detergents/soaps/solvents/acids/alkalis
  - Mechanical irritants (friction)

# Step 2: Clinical examination

- Skin examination
- Other systems as necessary





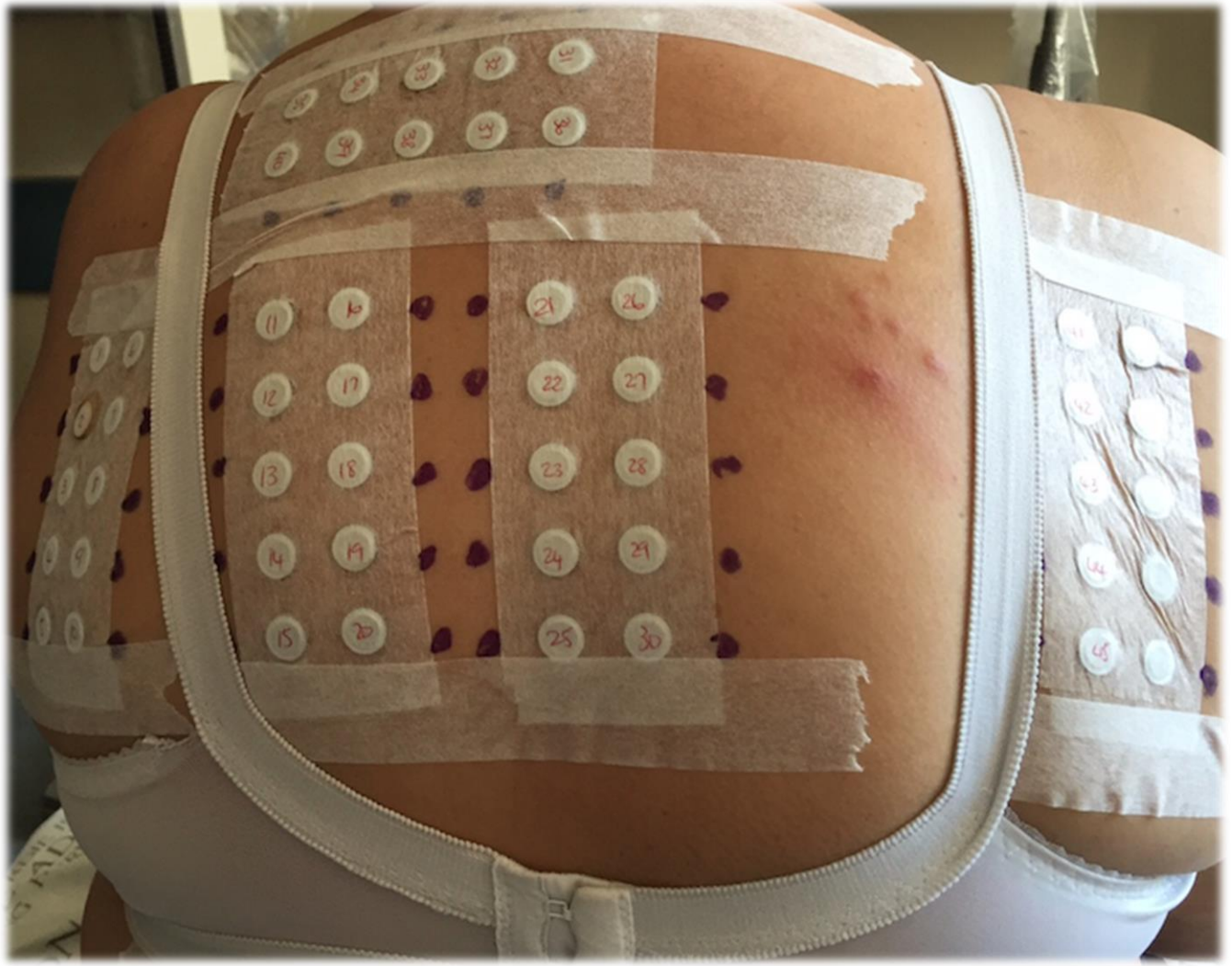
# Distinguishing irritant from allergic contact dermatitis

| Chronic irritant contact dermatitis | Allergic contact dermatitis |
|---|---|
| Occurs after prolonged contact with irritants (days to months) | Delayed hypersensitivity reaction – usually appears approximately 24 hours after exposure to allergen |
| Distribution tends to be limited to site of irritant exposure. May affect web spaces with wet work. | May be in a distribution of direct contact with allergen, but may ‘spill’ beyond. May appear at distant sites |
| Tends to present more as dry, fissured skin with burning rather than itch | Acute presentation has hallmarks of acute eczema – erythema, vesicles, itch. Chronic includes hyperpigmentation, lichenification |
| No activated T-cells: Negative patch tests | Activated T-cells: Positive patch test to a relevant contact allergen |

# Step 3: Patch testing for delayed hypersensitivity

- On the back
- Commercial allergens &
  work agents

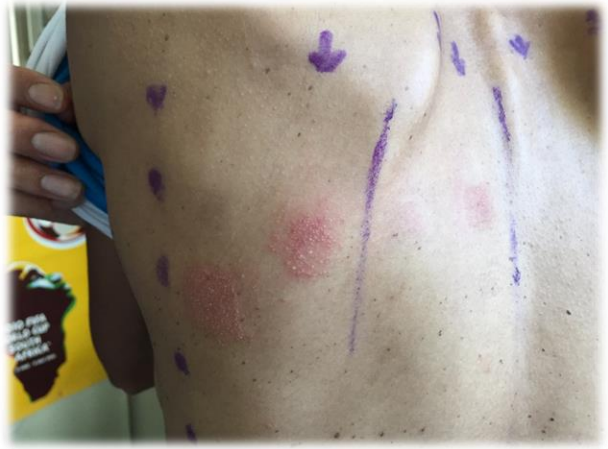
- Contra-indications:
  - Active dermatitis on back
  - Immunosuppressive treatment
  - Recent tan/sunburn
  - (Pregnancy)
  - (Breastfeeding)

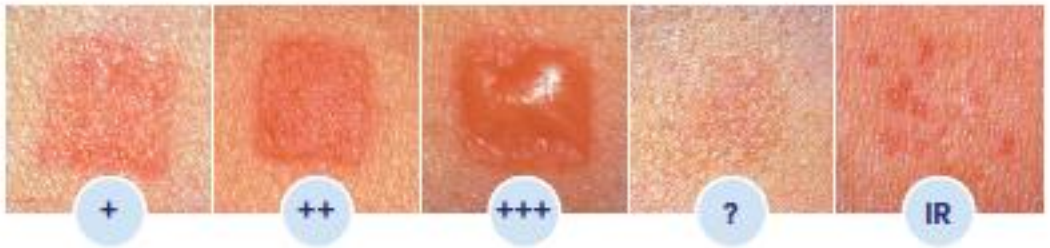


# Patch test reading

- Left in situ 48 hours
- Read at 72 hours

- Relevance of positive reactions






+ Weak Positive Reaction:
non-vesicular with erythema, infiltration, possibly papules

++ Strong Positive Reaction:
vesicular, erythema, infiltration, papules

+++ Extreme Positive Reaction:
bullous or ulcerative reaction

? Doubtful Reaction:
faint macular erythema only

IR Irritant Reaction:
Pustules as well as patchy follicular or homogeneous erythema without infiltrations are usually signs of irritation and do not indicate allergy. Itching is a subjective symptom that is expected to accompany a positive reaction.

Source: www.smartpractice.com

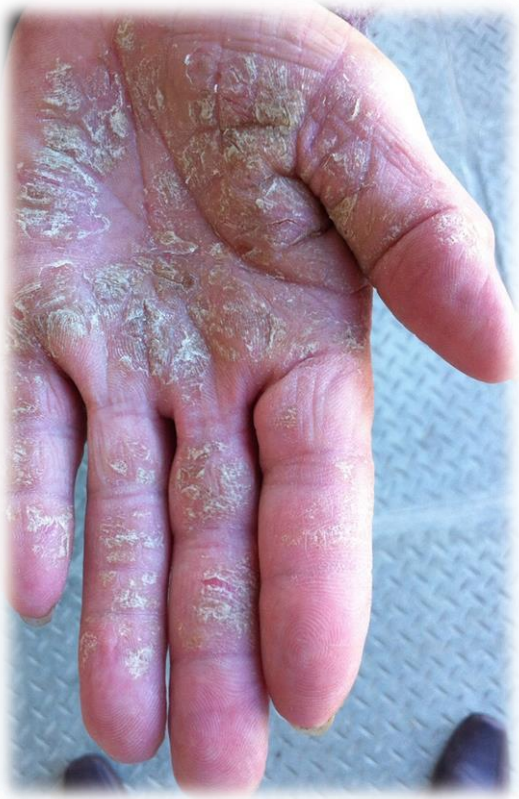
# Step 4: Other special investigations

- Biopsy
- Fungal scraping

- To exclude:
  - Psoriasis
  - Tinea manuum

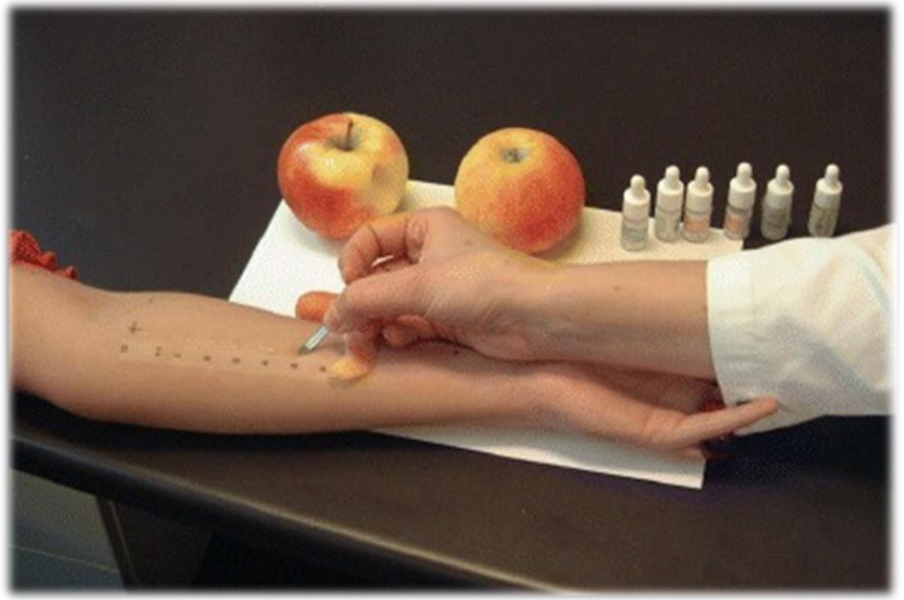
Hyperkeratotic irritant contact dermatitis

Psoriasis



# Prick prick testing & specific IgE

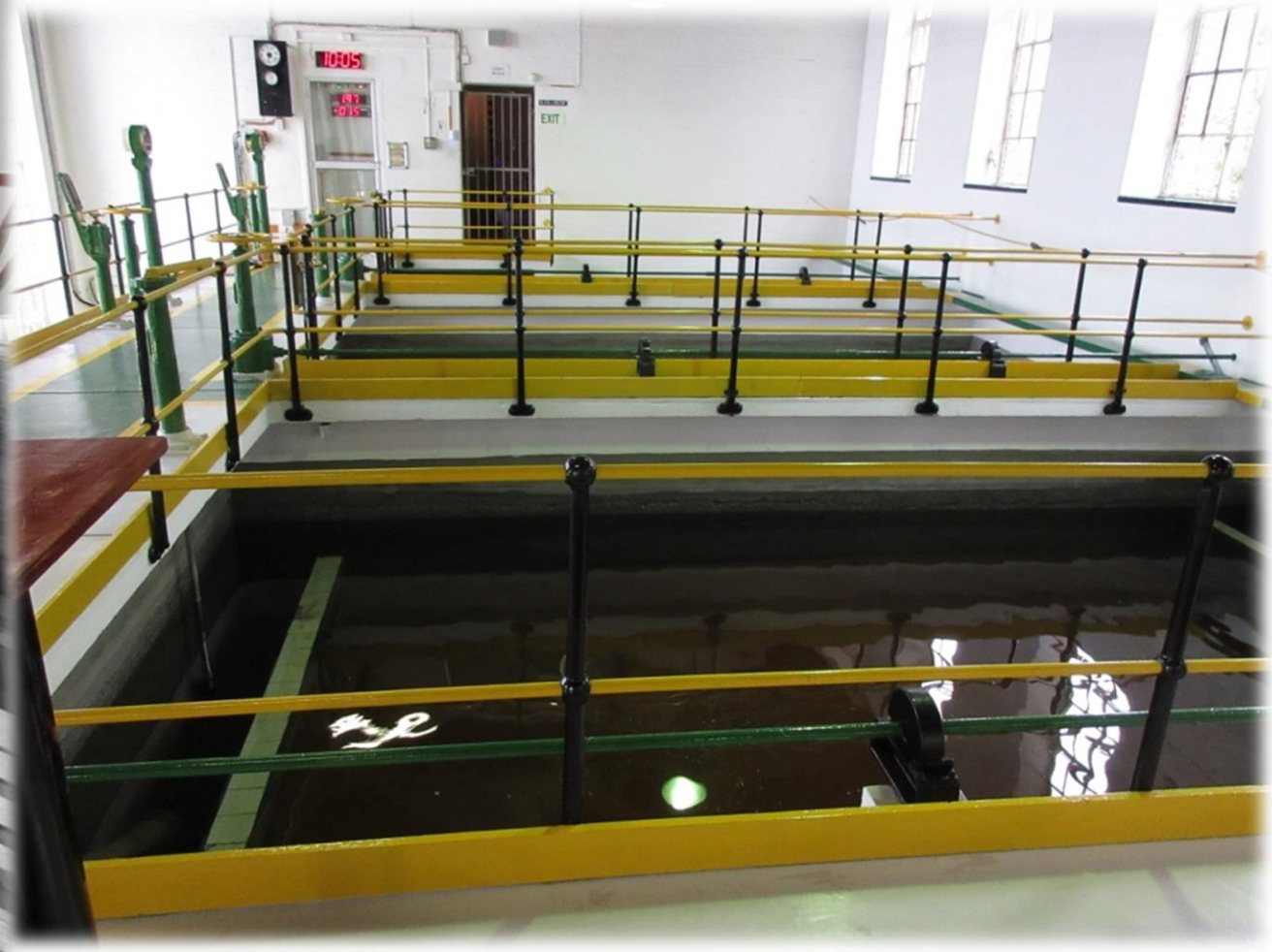
- Not for allergic contact dermatitis
- Performed rarely as protein contact dermatitis and contact urticaria are far less common than contact dermatitis
- Suggested by history of immediate reaction
  - itch, wheal & flare



# Step 5: Workplace assessment

- Difficult to do risk assessment for skin exposure
  - No methods for measuring skin exposure directly
  - Incomplete data about safe exposure levels
  - Time consuming to do as wide range of chemicals and tasks, and toxicology may not be obvious


SOLUCARE
Food Surfa
Sanitise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# Management of occupational skin disease

# Management of the patient

- Avoidance of irritant exposures
- Allergen avoidance
- Topical steroids: Potent (Dovate) weaning to milder (Lenovate/Persivate)
- Emollients: Cetomacrogol/HEB preferable to aqueous cream

# Avoiding irritant exposures

- Avoid soaps and grit cleansers – rather wash with emollients
  - For healthcare workers – alcohol sanitiser only unless hands visibly soiled
- Frequent application emollients
  - Barrier creams do not prevent absorption of chemicals
- Try to ensure hands are dry in gloves
  - Wear cotton liners inside occlusive rubber gloves. Replace liners as soon as they become wet (will need several pairs)
- Wear gloves above the elbow for wet work, not short gloves
- Avoid direct contact with solvents, alkalis, acids

# When to refer for specialist assessment?

- Contact dermatitis does not improve with usual treatment and irritant avoidance.
- History and examination suggest exposure to allergens rather than irritants, and this warrants further investigation.
- For compensation purposes or workplace interventions.

# Take home messages

- Always consider occupation in hand dermatitis or exposure-pattern dermatitis.
- Start by addressing irritant exposures and appropriate steroid and emollient use
- Refer/investigate further if not responding to appropriate treatment & irritant avoidance in a couple of months; if recurrent episodes; or if concerning history.
- Allergen avoidance and job modifications mainstay of treatment for allergic contact dermatitis.

# Referral/advice centres for assistance with occupational diseases

- Cape Town
  - Groote Schuur Hospital (E16) Occupational Medicine Clinic (specify Dermatology for skin cases), (021) 404 4369
  - Tygerberg Hospital, Respiratory Clinic, (021) 938 5524

- Johannesburg
  - National Institute of Occupational Health, Braamfontein, (011) 712 6400

- Durban
  - King Edward Hospital, Occupational Medicine Clinic, (031) 360 3512/3 or (031) 260 4507

# Useful websites

- www.labour.gov.za
- www.hse.gov.uk
- www.cdc.gov

# References


- Occupational skin diseases and dermal exposure in the European Union (EU-25): policy and practice overview. European Agency for Safety and Health at Work. Belgium, 2008.
- Belsito DV. Occupational contact dermatitis: etiology, prevalence and resultant impairment/disability. J Am Acad Derm 2005; 53: 303-13.
- Personen et al. Patch test results of the European baseline series among patients with occupational contact dermatitis across Europe – analyses of the European Surveillance System on Contact Allergy Network 2002-2010. Contact Dermatitis 2015; 72:154-163