Occupational dermatoses due to COVID-19 measures: pandemic within a pandemic

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Research Group of Allergy and Clinical Immunology, KU Leuven
Occupational dermatoses during COVID-19

‘A different type of second wave’

‘A pandemic within a pandemic’

‘Second pandemic: a pandemic of dermatitis’

• HCW in China pre-covid 20-50% versus after the first wave 71-97%

• Due to ↑ hand hygiene and use of personal protective equipment (PPE)

• Irritant contact dermatitis, allergic contact dermatitis, pressure urticaria, friction dermatitis, aggravation of pre-existing dermatoses (e.g. Koebner phenomenon in psoriasis patients),...

Table I. Clinical features of skin damage among first-line health care workers

<table>
<thead>
<tr>
<th>Clinical features*</th>
<th>Participants with skin damage (N = 526), No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms</td>
<td></td>
</tr>
<tr>
<td>Dryness/tightness</td>
<td>370 (70.3)</td>
</tr>
<tr>
<td>Tenderness</td>
<td>299 (56.8)</td>
</tr>
<tr>
<td>Itching</td>
<td>276 (52.5)</td>
</tr>
<tr>
<td>Burning/pain</td>
<td>200 (38.0)</td>
</tr>
<tr>
<td>Skin lesions</td>
<td></td>
</tr>
<tr>
<td>Desquamation</td>
<td>327 (62.2)</td>
</tr>
<tr>
<td>Erythema</td>
<td>260 (49.4)</td>
</tr>
<tr>
<td>Maceration</td>
<td>210 (39.9)</td>
</tr>
<tr>
<td>Fissure</td>
<td>204 (38.8)</td>
</tr>
<tr>
<td>Papule</td>
<td>173 (32.9)</td>
</tr>
<tr>
<td>Erosion and ulcer</td>
<td>53 (10.1)</td>
</tr>
<tr>
<td>Vesicle</td>
<td>7 (1.3)</td>
</tr>
<tr>
<td>Wheal</td>
<td>2 (0.4)</td>
</tr>
<tr>
<td>Site</td>
<td></td>
</tr>
<tr>
<td>Nasal bridge</td>
<td>437 (83.1)</td>
</tr>
<tr>
<td>Cheek</td>
<td>414 (78.7)</td>
</tr>
<tr>
<td>Hands</td>
<td>392 (74.5)</td>
</tr>
<tr>
<td>Forehead</td>
<td>301 (57.2)</td>
</tr>
</tbody>
</table>

*With overlaps.
Hand dermatitis

- Mostly irritant contact dermatitis (ICD) from irritants in soaps, antiseptic foams (also detergents), and desinfectants with quaternary ammonium compounds (‘quats’, e.g. benzalkonium chloride and didecyl dimethyl ammonium chloride)

- More rarely allergic contact dermatitis (ACD) from allergens in soaps and moisturizers (e.g. formaldehyde-releasers, fragrances) and gloves (e.g. rubber additives)
Hand hygiene during Covid-19

Proper hand hygiene: 24-31% likelihood of decreasing virus transmission

- Natural soaps: natural fats reacting with lye/alkali, resulting in a fatty acid salt with cleansing properties; inactivates viruses by disrupting the lipid membrane and intracellular lipids

  Use of water, 20” = physically washing away dirt and pathogens

  Removal of intracellular lipids and skin proteins in the stratum corneum

  → increases skin sensitivity and irritation

• Synthetic detergents (syndets): surfactants such as sodium lauryl sulfate, cocamide diethanolamine, decyl glucoside
  
  Not effective against non-enveloped viruses
  
  Possible to add lipophilic or other moisturizing ingredients
  
  (petrolatum, glycerin, vegetable oils, shea butter)

• Antiseptic handwashes: soaps or syndets + antimicrobial ingredient
  
  Risk of (contact) allergic reactions

---

**Table 1. Activity of antimicrobial ingredients against enveloped viruses such as coronaviruses**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Virucidal activity against enveloped viruses</th>
<th>Allergenicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroxylenol</td>
<td>High</td>
<td>+</td>
</tr>
<tr>
<td>Ethanol</td>
<td>High</td>
<td>-</td>
</tr>
<tr>
<td>Povidone iodine</td>
<td>High</td>
<td>+/-</td>
</tr>
<tr>
<td>Sodium hypochlorite (bleach) (0.21%)</td>
<td>High</td>
<td>-</td>
</tr>
<tr>
<td>Triclosan/triclocarban</td>
<td>High</td>
<td>+/-</td>
</tr>
<tr>
<td>Benzalkonium chloride</td>
<td>Moderate</td>
<td>+</td>
</tr>
<tr>
<td>Chlorhexidine digluconate</td>
<td>Moderate</td>
<td>+</td>
</tr>
<tr>
<td>Benzethonium chloride</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>Phenolic compounds</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>Quaternary ammonium compounds</td>
<td>Low</td>
<td>-</td>
</tr>
</tbody>
</table>

*Rundle et al. J Am Acad Dermatol 2020*
• Alcohol-based hand sanitizers: >60% ethanol or >70% isopropanol

  Less lipid-dissolving effects → less ICD

  Longer contact-time needed: 60’’

  Dehydrating → add emollients or moisturizers (e.g. glycerin)

!! Disinfectant wipes (e.g. Clinell®, Trionic®) only for surface cleaning

  → handle with gloves (often quaternary ammonium compounds....)
ICD due to hand hygiene measures

- Depends on concentration, duration and intensity of skin contact with irritant ingredients
- Combination of chemical and physical irritation (e.g. detergents and hot water) → pro-inflammatory cytokines → skin barrier disruption
- = 80% of occupational contact dermatoses!
- Study in China: 66% of HCW washed their hands >10 times per day during the first outbreak, only 22% applied a moisturizer

Prevention of ICD

= Maintain integrity of the skin barrier

A. Gentle cleansing

• Use lukewarm water

• Do not wash AND only use alcohol-based hand solutions

• Preferably use alcohol-based hand solutions containing glycerin

• Preferably use a hand wash oil

• Avoid friction (e.g. rough paper towels, rubbing)

• Make sure hands are dry before putting on gloves

Balato et al. European Task Force on Contact Dermatitis statement on covid-19 outbreak and the risk of adverse cutaneous reactions. JEADV 2020: e346–e432
B. Regular (re)hydration

- Ointment > cream > lotion > gel
  (night-time *versus* during day-time)
- Ingredients: ‘less is more’, fragrance free
- Pocket-sized, adjusted to individual needs, intolerances and preferences
- Minimum 2 ‘fingertips units’ per hand, wait 1-3 min
- Re-apply after every washing and/or every 3-4 hours

C. Avoid skin-contact with other irritants

Use appropriate gloves (e.g. accelerator-free nitrile)

Wear cotton gloves underneath (↓ occlusion, maceration)
ACD due to hand hygiene measures

- Depends on concentration, duration and intensity of skin contact with sensitizing ingredients
- Combination with irritant contact dermatitis (damaged skin barrier)

**Table II. Allergens commonly encountered with regular hand hygiene**

<table>
<thead>
<tr>
<th>Gloves</th>
<th>Soaps, synthetic detergents, and antiseptics</th>
<th>Hand sanitizers</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Latex</td>
<td>III. Fragrance</td>
<td>V. Preservatives</td>
</tr>
<tr>
<td>II. Rubber accelerators</td>
<td>IV. Surfactants</td>
<td></td>
</tr>
<tr>
<td>- Thiurams</td>
<td>- Cocamidopropyl betaine</td>
<td>- Dimethyloldimethyl hydantoin</td>
</tr>
<tr>
<td>- Carbamates</td>
<td>- Cocamide diethanolamine</td>
<td>- Diazolidinyl</td>
</tr>
<tr>
<td>- Diphenylguanidine</td>
<td>- Decyl glucoside</td>
<td>- Formaldehyde</td>
</tr>
<tr>
<td>- Mixed dialkyl thioureas</td>
<td>- Dimethyldimethylaminopropylamine</td>
<td>- Iodopropynyl butylcarbamate</td>
</tr>
<tr>
<td>- Benothiazoles</td>
<td>- Oleamidopropyl dimethylamine</td>
<td>- Imidazolidinyl urea</td>
</tr>
</tbody>
</table>

*Rundle et al. J Am Acad Dermatol 2020*
<table>
<thead>
<tr>
<th>Hand hygiene products</th>
<th>Components</th>
<th>Allergens</th>
<th>Irritants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol-based hand rub (liquid, gel or foam)</td>
<td>Contain one or more types of alcohol, humectants, other active ingredients with excipients</td>
<td>Alcohols - ethanol, isopropanol, Fragrances, Acrylates, Preservative, Benzyl alcohol, Stearyl or isostearyl alcohol, Quatemium ammonium chloride (QAC), Iodine or iodophors, Chlorhexidine, Triclosan, Chloroxylenol, Phenoxethanol, Myristyl alcohol, Propylene glycol, Parabens, Benzalkonium chloride</td>
<td>Ethanol, n-propanolol, isopropanolol, chlorhexidine, chloroxylenol, triclosan</td>
</tr>
<tr>
<td>Waterless/bar soaps</td>
<td>With or without added antiseptic agents</td>
<td>Fragrances, tocopherol, Polyethylene glycol, Ethylhexylglycerin</td>
<td>SLS – sodium lauryl sulphate</td>
</tr>
<tr>
<td>Water-based/liquid soaps</td>
<td></td>
<td>Fragrances, Methylchloroisothiazoline/methylisothiazoline (MCI/MI), Quatemium-15, Sodium benzoate, Phenoxethanol, DMDM hydantoin, Iodopropynyl butylcarbamate, Alkyl glucosides, Chloroxylenol, Polyethylene glycol, Cocamidopropyl betaine, Triclosan</td>
<td></td>
</tr>
<tr>
<td>Antiseptic agents</td>
<td>Dettol (chloroxylenol B.P. 4.8%/w/v)</td>
<td>Chloroxylenol, terpineol, Chlorhexidine gluconate, benzyl benzoate, cetrimide, isopropyl alcohol, terpineol</td>
<td>Chloroxylenol, alcohol, Cetrimide, chlorhexidine, gluconolactone, Sodium hydroxide</td>
</tr>
<tr>
<td>Antiseptic hand wipe</td>
<td>Fabric or paper pre-wetted with an antiseptic agent. Not as effective as antiseptic agents or alcohol-based hand rubs</td>
<td>Methylchloroisothiazoline/methylisothiazoline (MCI/MI), Propylene glycol, Fragrances, Benzalkonium chloride</td>
<td></td>
</tr>
</tbody>
</table>
ACD from gloves

- Increased use of gloves
- Increased duration of use
  - Prolonged exposure time to allergens and increased sweating
  - Increase release of allergens from the rubber gloves
    (e.g., thiuram and carbamate chemicals, diphenylguanidine)
<table>
<thead>
<tr>
<th>Gloves</th>
<th>Additional information</th>
<th>Allergens</th>
<th>Irritants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural rubber latex (NRL)</td>
<td>- Users can be sensitive to either NRL or chemical additives or both.</td>
<td>rubber accelerators (thiuram, carbamates, mercaptobenzothiazole, diphenylguanidine)</td>
<td>Glove powder - cornstarch based</td>
</tr>
<tr>
<td>gloves (powdered or unpowdered)</td>
<td>- Can worsen existing hand dermatitis from occlusion and maceration</td>
<td>antioxidants (diaminodiphenylmethane, paraphenylenediamine, black rubber mix)</td>
<td>Sterilization of gloves by gamma irradiation can increase bacterial endotoxin level, which is water soluble and can be absorbed onto glove powder leading to irritation</td>
</tr>
<tr>
<td>Synthetic rubber gloves</td>
<td>- Manufactured similarly to latex gloves, including use of vulcanization accelerators</td>
<td>rubber accelerators (carba mix, carbamates, thiuram mix, 1,3-diphenylguanidine, benzothiazoles, thioureas)</td>
<td>Cetylpyridinium chloride</td>
</tr>
<tr>
<td>Nitrile gloves</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vinyl gloves</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neoprene gloves</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Also ACD

Bhatia et al. JEADV 2020
Prevention of glove ACD

- Avoid ICD by maintaining the skin barrier (‘Barrier creams’ may be helpful, but their use is equivalent to regular moisturizers)
- Accelerator-free neoprene or nitrile gloves


<table>
<thead>
<tr>
<th>Handschuh</th>
<th>Material</th>
<th>TU</th>
<th>DTC</th>
<th>TH</th>
<th>MBT</th>
<th>Sonstige</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCUTECH</td>
<td>Latex</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCUTECH COATED</td>
<td>Latex</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCUTECH AMBI</td>
<td>Latex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCUTECH Gammex</td>
<td>Latex</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALPHATEC</td>
<td>Nitril</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Differential diagnoses of occupational ICD/ACD

- Atopic dermatitis
- Psoriasis
- Dyshidrotic eczema
- Tinea manuum
- Scabies
- Non-occupational ACD/ICD
- ...

...
## Facial dermatoses

Table 1. Clinical features and other data of healthcare workers suffered from dermatoses

<table>
<thead>
<tr>
<th>Variables</th>
<th>Number (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of dermatoses:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Irritant contact dermatitis</td>
<td>17</td>
<td>39.53</td>
</tr>
<tr>
<td>ii. Allergic dermatitis</td>
<td>03</td>
<td>6.98</td>
</tr>
<tr>
<td>iii. Pressure/friction marks/rhagades</td>
<td>11</td>
<td>25.58</td>
</tr>
<tr>
<td>iv. Sweat dermatitis</td>
<td>07</td>
<td>16.28</td>
</tr>
<tr>
<td>v. Facial acne</td>
<td>05</td>
<td>11.63</td>
</tr>
<tr>
<td>vi. Lip lick dermatitis</td>
<td>04</td>
<td>09.30</td>
</tr>
</tbody>
</table>

Irritation (ICD) under face mask/goggles

- Condensation and cosmetic build-up
- Dryness (due to occlusion)
- Mechanical pressure (mostly FFP3)
- Synthetic fibers
- Friction
• Prevention during work
  - Regular breaks, teams rotation (restrict duration of wearing)
  - Use (light) moisturizer
  - ∆ room temperature to avoid transpiration
  - Use dimethicone polymers or silicone gels to minimize mechanical friction (e.g. Cavilon® spray/swab)
  - Use tape at friction points (e.g. Microfoam®, Mepitac®)

• Prevention after shift
  - Mild cleansing and lipid-rich moisturizer
• Treatment in case of lesions
  - Use an antiseptic (and let dry!)
  - Use hydrocolloid or foam dressing (e.g., Mepilex border lite®)
ACD from face masks

More rarely

<table>
<thead>
<tr>
<th>Masks</th>
<th>Purpose</th>
<th>Allergens</th>
<th>Irritants</th>
</tr>
</thead>
</table>
| Standard surgical mask or fluid resistant surgical mask | • Single use mask  
• Loose fitting  
• Prevents large particles (> 5 microns) expelled by the wearer from reaching the environment  
• Fluid resistant  
• Protects against large droplets and splashes | • Thiuram (in elastic ear strap);  
• Methylidibromo glutaronitrile;  
• Cocospolynediamine-guanidinium diacetate (preservative in disinfectant for cleaning mask);  
• Dibromodicyanobutane (in adhesive used in mask) | Friction and humidity |
| N95 respirator or filtering face piece (FFP) | • Fit tightly  
• Fluid resistant  
• Protects against very small airborne particles, body fluids and splashes  
• Has a filtration efficiency of 95% against particulate aerosols of size 300 nm and above | • Formaldehyde  
• Ethylene urea melamine formaldehyde  
• Quaternium-15 (formaldehyde releasing preservative)  
• Aluminium (in the nose clip) | Friction, mechanical pressure |
| FFP 1  
FFP 2 (highest level of protection) | | | |
| Home-made (cloth or paper masks) | • Loose fitting  
• Not fluid resistant  
• Prevents large particles expelled by the wearer from reaching the environment | • Formaldehyde textile resins (melamine formaldehyde, urea formaldehyde);  
• Formaldehyde releasers (quaternium-15, imidazolidinyl urea);  
• Disperse dyes, p-aminobenzene,  
• Paraphenylenediamine,  
• Naphthol AS, ‘Black rubber mix’  
• Lanolin | Friction, humidity |

Treatment of ACD/ICD

• Application of a topical corticosteroids (face < hands)

• Identify and avoid irritants and allergens

• If measures fail: refer to dermatologist; evaluation for patch testing

(Fedris: Snelle diagnose van contactdermatosen

https://fedris.be/nl/professional/beroepsziekten-privesector/

snelle-diagnose-van-contactdermatosen

➔ Baseline series (diphenylguanidine, propylene glycol, formaldehyde-and releasers), rubber additives, textile series, fragrances, masks, gloves and (ingredients of) products used by the patient
Referral for patch testing


- De rug moet vrij zijn van eczeemletsels.
- De rug mag kort voor de testen niet blootgesteld geweest zijn aan zonlicht.
- De rug mag de dagen voor de testen niet met een cortisonezelf behandeld zijn.
- Vanaf twee weken voor de testen mag u geen cortisone via inspuiting of via de mond gekregen hebben.

Tijdens de week waarin u getest wordt, mag u uw rug niet wassen. U mag dus niet baden of douchen en u moet activiteiten waarbij u zweet vermijden.

U komt drie of vier keer langs voor de testen.
Er zijn twee mogelijke schema's:

- Maandag (voormiddag of namiddag), woensdagvoormiddag en vrijdagvoormiddag *
- Dinsdagvoormiddag, donderdagvoormiddag en maandagvoormiddag

Het is belangrijk dat u op de eerste dag zelf de producten meebrengt die u heeft gebruikt en die waarschijnlijk de eczeemreactie hebben veroorzaakt of verergerd:
# Tailored advice

[Image of UZ Leuven Dermatology logo]

[Image of contactallergie.uzleuven.be/start]

**Applicatie Contactallergie**

prof. apr. em. A. Goossens | J. Drieghe | dr. S. Huygens | apr. L. Gilissen | L. Janssens

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**Geachte**

Verwijzend naar de resultaten van uw allergologisch onderzoek is volgende informatie nuttig.

U bent allergisch voor:

- **FRAGRANCE-PARFUM/PERUBALSEM**

Hieronder de (positieve) lijst van toegelaten cosmetische producten, voor zover opgenomen in ons computerbestand. Het blijft evenwel raadzaam om toch steeds de inhoudsstoffen op de verpakking na te gaan en bij twijfel uw apotheker te raadplegen.

## Toegelaten cosmetische producten

### Haarreiniging (shampoo)

<table>
<thead>
<tr>
<th>CMH</th>
<th>Product naam</th>
<th>Merk</th>
<th>Producvent</th>
<th>Galenische vorm</th>
<th>Datum verwerking</th>
</tr>
</thead>
<tbody>
<tr>
<td>2072-742</td>
<td><strong>BIODERMA NODE K</strong></td>
<td>Laboratoire Dermatologique BIODERMA</td>
<td>Laboratoire Dermatologique BIODERMA</td>
<td>Shampoo</td>
<td>3-8-16</td>
</tr>
<tr>
<td>3291-002</td>
<td><strong>DERMOLIN SHAMPOO 200 ML</strong></td>
<td>DermoLinn</td>
<td>Santesa B.V</td>
<td>Shampoo</td>
<td>15-3-17</td>
</tr>
<tr>
<td>3291-010</td>
<td><strong>DERMOLIN SHAMPOO 400 ML</strong></td>
<td>DermoLinn</td>
<td>Santesa B.V</td>
<td>Shampoo</td>
<td>15-3-17</td>
</tr>
<tr>
<td>2349-991</td>
<td><strong>EUBOS 5% UREA SHAMPOO</strong></td>
<td>EUBOS</td>
<td>EUBOS - Dr. Hobein (Nacht.) GmbH, med. Rauhpflege</td>
<td>Shampoo</td>
<td>24-9-16</td>
</tr>
<tr>
<td>2914-859</td>
<td><strong>EUCERIN DERMOCAPILLAIRE KALMERENDE UREA SHAMPOO</strong></td>
<td>Eucerin</td>
<td>SA Beiersdorf NV</td>
<td>Shampoo</td>
<td>12-5-14</td>
</tr>
<tr>
<td>2914-885</td>
<td><strong>EUCERIN DERMOCAPILLAIRE SHAMPOO HOGE TOLERANTIE</strong></td>
<td>Eucerin</td>
<td>SA Beiersdorf NV</td>
<td>Shampoo</td>
<td>24-1-15</td>
</tr>
<tr>
<td>2464-360 2654-630</td>
<td><strong>LOUIS WIDMER ANTIROOSSHAMPOO ZONDER PARFUM</strong></td>
<td>Louis Widmer NV</td>
<td>Louis Widmar NV</td>
<td>Shampoo</td>
<td>16-3-15</td>
</tr>
<tr>
<td>2164-226</td>
<td><strong>LOUIS WIDMER REMEDERM SHAMPOO</strong></td>
<td>Louis Widmar NV</td>
<td>Louis Widmar NV</td>
<td>Shampoo</td>
<td>16-3-15</td>
</tr>
<tr>
<td>1368-080 1669-850</td>
<td><strong>LOUIS WIDMER SOFT SHAMPOO ZONDER PARFUM</strong></td>
<td>Louis Widmar NV</td>
<td>Louis Widmar NV</td>
<td>Shampoo</td>
<td>17-3-15</td>
</tr>
<tr>
<td>2730-711</td>
<td><strong>SENSINOL SHAMPOO</strong></td>
<td>Ducray</td>
<td>SA Pierre Fabre Benelux NV</td>
<td>Gel</td>
<td>12-5-15</td>
</tr>
</tbody>
</table>
Occlusive acne (‘mask acne’, ‘maskne’)

Due to the occlusive effects of face mask use, mostly mild

- Humidity from breathing and sweating creates ideal climate for bacteria
- Build-up of sebum and sweat block pores

Treatment

- Avoid make-up, use gentle cleanser and a non-comedogenic moisturizer
- Regularly switch mask
- Cosmetic treatment (e.g. Effaclar®, Cleanance®)
- Topical benzoylperoxide (e.g. Benzac® gel)
Other acneiform eruptions

• Rosacea, peri-oral dermatitis (‘clown-dermatitis’), folliculitis

• Due to build-up of make-up/liphophilic cosmetic ingredients

• Aggravated by use of (strong) topical corticosteroids

• Cosmetic treatment (e.g., Roséliane®)

• Topical metronidazole (e.g., Rozex crème®)
Seborrheic dermatitis

• Inflammation of the skin associated with yeast *Pityrosporon* (*Malassezia*)

• Topical medicinal treatment with ketoconazole or miconazole
  (e.g., Nizoral® shampoo, Daktarin® cream)
Cheilitis

• Dry lips, fissures, progression to peri-oral lesions

• Aggravated by lip-lick, ‘picking’ and ‘peeling’

• Dd. contact dermatitis (e.g., toothpaste ingredients)

• Prevention/treatment
  - Stop wet-dry cycle: stop lip-lick, regular breaks
  - Emollients (e.g. paraffin-petrolatum)

Conclusion

• Occupational dermatoses due to COVID-19 measures: most frequently irritant in nature

• Prevention is paramount
  - Correct hand hygiene
  - Hand and facial moisturizers
  - Adequate glove use