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Cite this as: *BMJ* 2021;373:n1304  
<http://dx.doi.org/10.1136/bmj.n1304>

Published: 7 June 2021

## PRACTICE POINTER

# Mask related acne (“maskne”) and other facial dermatoses

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### What you need to know

- Not all facial dermatoses related to personal protective equipment are “maskne”
- Irritant contact dermatitis is the most common cause
- Maintenance of the skin barrier and regular “mask breaks” are important aspects of management, in addition to standard medical treatment of the skin condition

The covid-19 pandemic has led to a marked increase in the use of personal protective equipment (PPE) both in and out of healthcare settings. The term “maskne” has become increasingly popular during the pandemic, particularly in the media, where it is used to describe several facial dermatoses. Individuals often buy expensive but potentially ineffective treatments for these conditions.

In this practice pointer we summarise the most common causes of facial eruptions associated with wearing facial PPE, and highlight the key areas to cover when assessing someone with new or worsening pre-existing facial dermatoses that they attribute to the use of facial PPE.

“Facial PPE” in this article includes full face shields, visors, safety spectacles, surgical masks (fluid resistant surgical mask, FRSM type IIR), and respirator masks (eg, FFP3, FFP2, and N95).<sup>1</sup>

### How common is “maskne”?

Facial dermatoses related to PPE have been well described, but data about their prevalence are limited, and often a descriptive terminology is used rather than specific diagnoses. Based on the limited available evidence, mask related acne and irritant contact dermatitis are the most common facial dermatoses associated with mask wearing.<sup>2-5</sup>

During the covid-19 pandemic, a prospective cross sectional study of 833 medical school staff in Thailand, including healthcare and non-healthcare workers, showed a self-reported prevalence of 54% adverse skin reactions to surgical and cloth masks.<sup>6</sup>

### How should facial dermatoses be assessed?

Typically, a patient presents with new onset facial eruption, or exacerbation of a pre-existing dermatosis that is most pronounced in the area covered by the mask. Ideally, such an assessment would take place in person, but video consultation provides an acceptable alternative.

### Key information to elicit in a “maskne” history

- Relevant history and family history of skin disease and a comprehensive drug history that includes

prescribed, over-the-counter, and complementary medicines

- Temporal relationship with mask wearing—establish if periods without mask wearing alleviate or improve the problem, eg, allergic contact dermatitis should improve with a period of no mask wearing, while acne, once established, may not respond so readily
- Symptoms of itch, soreness, and appearance of pustules or papules
- Duration of PPE exposure each day
- Ask if “mask breaks” (periods of time when facial PPE is removed entirely) are allowed or taken
- Assess the impact on the patient’s mood, work, and social life to assess severity and decide further management. The effect of PPE related dermatoses on the life quality of healthcare workers can be substantial<sup>3</sup>

Examination should focus on the morphology of the eruption, the distribution, and whether it is present at sites other than the face.

### What are the common causes and how should they be treated?

Each condition described below may appear de novo or be exacerbated by wearing facial PPE. Exacerbation tends to result from the development of a warm, moist, occlusive environment around the face, particularly during mask use. Added to this is the frictional effect of the material held in place with elastic.

General measures to prevent PPE related facial dermatoses are outlined in the box and are advised in the treatment of all conditions listed below. Additional standard medical treatment for each dermatosis is discussed separately. When post-inflammatory hyperpigmentation or scarring occurs, a more aggressive treatment approach is required to prevent irreversible skin changes. Referral to specialist care is warranted at this stage if no improvement occurs.

### Irritant contact dermatitis

Irritant contact dermatitis (ICD) is the most common occupational and mask related dermatosis.<sup>3</sup> ICD is a form of exogenous eczema caused by direct physical or chemical injury. Pressure ICD related to facial masks is commonly described<sup>4</sup> over the cheeks and nasal bridge.<sup>3,5</sup> It is associated with prolonged mask wearing (>6 hours) and its severity depends on the irritant and chronicity of exposure.<sup>3</sup> Presentation ranges from a discrete, dry, scaly patch to oedema and vesicles, erosions, and ulceration.<sup>3,5</sup> People with

atopic dermatitis, who already have a defective skin barrier, are particularly at risk of developing ICD.<sup>7</sup>

Enabling restoration of the skin barrier is key to treating ICD, and regular mask breaks (every hour for respirators) is one way to do this.<sup>8</sup> For broken skin, a silicon backed dressing such as Mepilex Border Lite can be applied to protect the skin and ensures that the mask seal remains intact.<sup>9</sup>

### Allergic contact dermatitis

Allergic contact dermatitis (ACD) (fig 1) is a delayed type IV hypersensitivity reaction to an external allergen, and is much less common than ICD.<sup>9,10</sup> Typically, it occurs after exposure to preservatives such as formaldehyde<sup>11</sup> and dibromodicyanobutane,<sup>12</sup> but thiuram, a rubber accelerator found in the elastic straps on surgical masks,<sup>13</sup> is also a recognised allergen. Metal wires are used to mould the mask to the face; nickel and cobalt have both been reported as causes of facial ACD.<sup>14</sup>



Fig 1 | Allergic contact dermatitis

ICD and ACD can be clinically indistinguishable. Both usually manifest as localised dermatitis but well demarcated areas of inflammation and redness are more suggestive of ACD, while a more diffuse pattern is more commonly seen in ICD. Treatment involves a short course of a mild to moderate potency corticosteroid, such as hydrocortisone 1% ointment. Avoiding allergens prevents further episodes, and therefore identification of causative agents is key. This can be achieved by patch testing, indicated where well demarcated areas are seen clinically and in cases of severe disease.

### Atopic eczema

Atopic eczema is a very common dermatitis that affects up to 20-30% of children and 2-10% of adults.<sup>15</sup>

Wearing a mask may have an irritant effect on the more delicate facial skin of a patient with eczema, plus the occlusive, moist environment favoured by mask wearing may have a deleterious effect on the skin, favouring the worsening of eczema.

## Seborrhoeic eczema

This dermatosis (fig 2) affects approximately 1-3% of the adult population and usually starts in young adult life.<sup>16</sup> On examination, a dermatitis with greasy yellow scale predominantly affecting the scalp, eyebrows, glabellar, and nasolabial folds is common.

Management involves regular antifungals such as ketoconazole 2% shampoo and/or short courses of mild topical corticosteroids such as hydrocortisone 1% ointment.<sup>17</sup> As with atopic eczema, the warm, moist, occlusive environment created by mask wearing may predispose to development of seborrhoeic dermatitis.



Fig 2 | Seborrhoeic eczema

## Periorificial dermatitis

Periorificial dermatitis consists of a patchy erythema with tiny papulopustules, affecting the periocular and perioral skin of young women (with sparing of the vermillion border). It can be idiopathic, or is caused by the use of cosmetics or topical corticosteroids directly or indirectly (via fingers that are applying the agent elsewhere). Mask wearing may predispose to the development of periorificial dermatitis for reasons similar to those listed for atopic and seborrhoeic dermatitis. Management involves stopping the implicated cream and simplifying the skin care regimen. Topical

antibiotics such as erythromycin will suffice for milder cases but often a four week course of a tetracycline, such as lymecycline 408 mg once daily, is needed.<sup>18</sup>

## Urticaria

Both pressure and contact urticaria (fig 3) are uncommon complications of PPE.<sup>11 19</sup> Pressure urticaria is caused by the downward pressure of the mask and is characterised by the formation of wheals, immediately or delayed (4-6 hours), after a pressure stimulus. A well fitted mask that is not over tight is recommended, or alternatively a change in PPE.<sup>19</sup>



Fig 3 | Urticaria

Contact urticaria is an immediate reaction to an offending allergen such as latex or formaldehyde. It typically resolves within 24 hours of removal of the contact trigger. Regular non-sedating H1 antihistamines such as loratadine are the mainstay of treatment for inducible urticaria.<sup>20</sup>

#### Acne

Acne vulgaris (fig 4) is a chronic inflammatory disease of the pilosebaceous unit. PPE related acne, which may be considered a subtype of acne mechanica, occurs in people with a previous history of acne vulgaris as well as in those previously unaffected. It has been associated with surgical masks and N95 respirators.<sup>23 21</sup>



Fig 4 | Acne

The pathogenesis of PPE related acne is thought to be threefold:

- Creation of a humid microclimate inside the mask
- Mucosa can be colonised by bacteria which could increase bacterial load on the surrounding skin
- Friction effect of a close fitting mask can damage the follicular ostia causing chronic irritation, and this effect is worsened by heat and humidity.<sup>22</sup>

Retinoids such as adapalene cream alone or in combination with benzoyl peroxide cream once daily can be used for mild cases, with the addition of an oral tetracycline such as lymecycline 408 mg once daily for up to 12 weeks for moderate to severe cases.<sup>23</sup>

### Rosacea

Rosacea (fig 5) typically affects adults aged 30-50 with fair skin.<sup>18</sup> Commonly, patients present with facial erythema and telangiectasias of the convexities (chin, cheeks, nose, forehead). The classic area of distribution of rosacea overlaps with that covered by a mask when worn correctly. The chronicity and presence of telangiectasias usually help to distinguish rosacea from peri-orificial dermatitis. Rosacea can be induced or worsened by prolonged periods of mask wearing. Medical treatment includes topical agents such as ivermectin 1% cream once daily for mild cases. An oral tetracycline such as moderate release doxycycline 40 mg once daily for 8-12 weeks can be added for moderate to severe cases.<sup>24</sup>



Fig 5 | Rosacea

### Folliculitis

Folliculitis (fig 6) on the face is more common in men because of its association with facial hair. Occlusive folliculitis, bacterial folliculitis, and pseudofolliculitis barbae (caused by ingrowing hairs) have clinically similar presentations with papules, pustules,

and more rarely nodules. A swab can exclude bacterial infection. Gentle daily cleansing with a soap-free cleanser, gentle exfoliation (to release ingrown hairs), and replacing dry shaving with wet shaving can all be helpful. Antibiotic treatment is indicated where bacteria are isolated; in purely inflammatory (sterile) cases, a combination steroid/antimicrobial cream can be used.<sup>25</sup>



Fig 6 | Folliculitis

#### General measures to prevent PPE related facial dermatoses<sup>26</sup>

- Cleanse skin<sup>26</sup> with a gentle soap-free cleanser
- Apply a light emollient at least 30 minutes before applying facial PPE<sup>26</sup>
- Apply a silicon based barrier tape—eg, siltape (Advancis)—to nasal bridge and cheeks<sup>4 9</sup>
- Wipe skin under PPE with a silicon based barrier wipe to provide a film, protecting the skin from the harmful microenvironment<sup>26</sup>
- Take time to fit the mask and ensure it is not over tight<sup>26</sup>
- Take regular breaks from the mask (every one hour for respirators) to relieve the pressure and prevent moisture build up<sup>26</sup>

- Stay well hydrated<sup>26</sup>
- Maintain oral hygiene (teeth brushing twice daily and daily interdental flossing/brushing)<sup>27</sup>

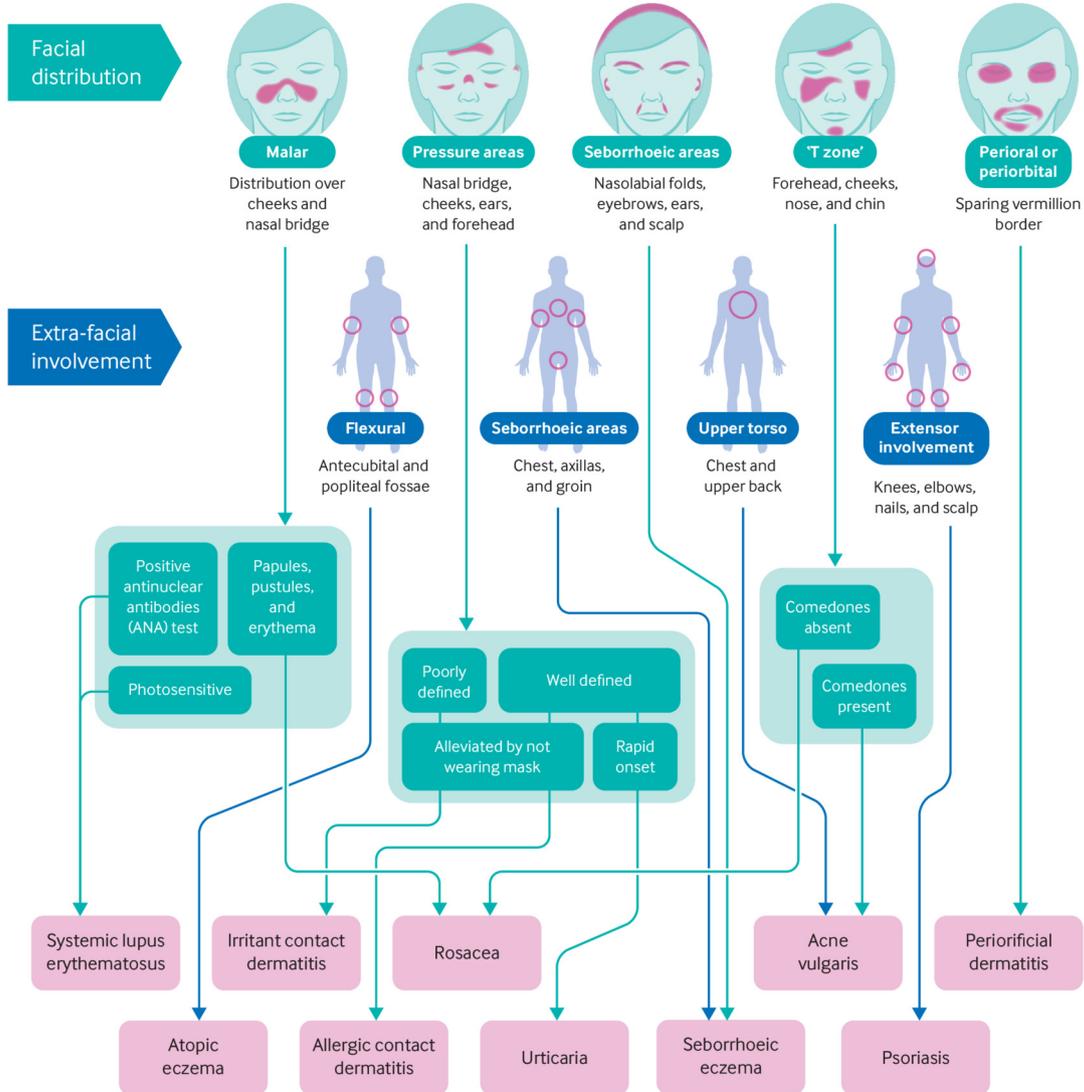
#### When to refer

Consider referral to secondary care in cases of severe, debilitating disease, or if the condition fails to respond to the treatments described above. Also consider a routine referral if specialist investigations, such as skin prick testing and patch testing in cases of suspected contact allergy, are indicated.

## Facial distribution of “maskne”

Assessing dermatoses after extended use of facial personal protective equipment

The covid-19 (SARS-CoV-2) pandemic has increased the use of personal protective equipment (PPE) such as face shields, visors, safety spectacles, and surgical masks. The term “maskne” may describe a myriad of facial dermatoses associated with wearing masks and other PPE. A key element of understanding the possible causes of these dermatoses is to consider the facial distribution and involvement of extra-facial sites. This graphic presents common distributions that can be used as a starting point for assessment of facial eruptions that may be caused by use of PPE.



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### Education into practice

- Consider how a facial dermatosis affects the patient's quality of life, work, and relationships

- Reflect on whether you incorporate considerations of different Fitzpatrick skin types in your treatment decisions, given the higher risk of post-inflammatory dyspigmentation and/or scarring in darker skin types

- Consider the occupational implications of the diagnosis and treatment for the patient, and discuss these as part of the consultation
- Signpost patients to the British Association of Dermatologists website as a useful repository of good quality reliable patient information leaflets on skin conditions (<https://www.bad.org.uk>)

### How patients were involved in the creation of this article

This article was reviewed by two healthcare workers who had experienced PPE related facial dermatoses and whose experience of receiving care informed the content of this article. Specifically, they advised on the content of the box “General measures to prevent PPE related facial dermatoses.”

### How this article was made

We obtained evidence using a systematic search of Medline, Embase, and Pubmed. Searches were confined to those publications written in the English language. Search terms used were “facial dermatoses” and “mask,” “facial dermatoses” and “PPE,” “acne” and “PPE,” “acne” and “mask,” “eczema” and “mask,” “allergic contact dermatitis” and “mask,” “FFP3 mask” and “skin,” “N95 mask” and “skin.”

Competing interests: We have read and understood the *BMJ* policy on declaration of interests and have none to declare.

Provenance and peer review: Commissioned; externally peer reviewed

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