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*Published in:*  
Dermatologic Therapy

*DOI (link to publication from Publisher):*  
[10.1111/dth.14589](https://doi.org/10.1111/dth.14589)

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*Publication date:*  
2021

*Document Version*  
Accepted author manuscript, peer reviewed version

[Link to publication from Aalborg University](#)

*Citation for published version (APA):*  
Searle, T., Ali, F. R., & Al-Niaimi, F. (2021). Identifying and addressing 'Maskne' in clinical practice. *Dermatologic Therapy*, 34(1), Article e14589. <https://doi.org/10.1111/dth.14589>

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## Identifying and addressing 'Maskne' in clinical practice

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Running title: Maskne

Word count (excluding title page and references): 770

Keywords: acne vulgaris, COVID-19, masks, maskne

Consent for publication: All authors have approved this final submitted version of the manuscript and consent to its submission for consideration of publication

Funding sources: None

Conflicts of Interest: None declared  
Data Availability – Nothing to declare

This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process which may lead to differences between this version and the [Version of Record](#). Please cite this article as doi: [10.1111/dth.14589](https://doi.org/10.1111/dth.14589)

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The widespread use of face masks and personal protective equipment during the COVID-19 pandemic and advent of “mask acne” has been largely overlooked in current literature. The portmanteau “maskne” has become common parlance amongst the public at large. Gomolin and colleagues<sup>1</sup> reported 22,000 Instagram posts that used the hashtag “maskne.” This condition had previously been documented in healthcare workers, but widespread mask use in the general population has resulted in the condition becoming more prevalent and widely recognised.<sup>2</sup> Maskne can occur in individuals with a previous history of acne vulgaris or arise “*de novo*” in previously acne-free individuals.

No studies to date have evaluated this phenomenon, but observational data suggests “maskne” is likely a result of local temperature changes and skin microflora dysbiosis, changes akin to those observed in acne mechanica and tropical acne. It is now well-known that skin microbiome changes are related to environmental factors such as temperature, *pH* balance, and humidity. In addition, alterations in local temperatures (from mask usage) can have an effect on sebum excretion rate as well as poral occlusion, the latter occurring as a direct result of prolonged local pressure. One study reported a 10% increase in sebum excretion for each one degree rise in temperature.<sup>3</sup> In addition, the high humidity can cause occlusion, irritation and swelling of the epidermal keratinocytes all of which contribute to acne flares.<sup>4</sup> Furthermore, changes in the skin microbiota can result from changes in the superficial sebum composition. Increased levels of interleukin-1 $\alpha$  produced in mechanical friction have also been associated with maskne.<sup>2</sup> It is unfortunate that the variation in cutaneous microbiota underneath the mask has not yet been analysed. Differences in bacterial isolates have been reported between non-inflammatory and

inflammatory lesions of acne vulgaris by Jusuf and colleagues and this is pertinent because masks appear to have a tendency to cause more inflammatory lesions than non-inflammatory lesions.<sup>5</sup> The effect of facial hair as a possible protective factor from “maskne” warrants further exploration as it seems that bearded people do not react as much despite the same confinement under the mask. Further investigation of mask materials and their propensity to cause “maskne” is required, for example the comparison of cotton and surgical face masks usually made from polypropylene.<sup>6</sup> Teo and colleagues discussed different face mask compositions with natural fibres augmenting fluid saturation, discomfort and adhesiveness and tightly woven fibres reducing stickiness.<sup>7</sup> In addition, the contamination of masks with infectious agents from outside as well as the reusable nature of many masks which are not washed often, and contamination by the hands must not be overlooked.

A recent article proposed a set of diagnostic clinical criteria for “maskne”.<sup>7</sup> These include: an onset of acne within six weeks of regularly wearing a face mask or exacerbation of acne over the area covered by a mask and the exclusion of other potential differential diagnoses such as perioral dermatitis, seborrheic dermatitis and acne rosacea.<sup>7</sup>

Han *et al.* reported 24 patients with acne flares associated with “maskne” after these patients had worn a mask for more than four hours per day over two months (although the duration of wearing a mask was found to be unrelated to acne severity).<sup>8</sup> The authors suggested that their patients should place two layers of gauze in their masks to reduce the amount of exhaled water vapour and sweat.<sup>7</sup>

General advice on skin hygiene is needed as well as the use of beta hydroxy acids (such as salicylic acid) washes or lotions to decrease hyperkeratosis and oil concentration in the skin.<sup>9</sup> A gentle foaming cleanser with anti-bacterial properties and hydrating moisturiser – preferably to maintain an intact barrier function such as niacinamide - is important as well as the use of barrier creams and products to restore the skin microbiome.<sup>9</sup> Topical nicotinamide has been found to have anti-inflammatory action and reduce sebum production.<sup>10</sup> Patients are encouraged to use oil-free products for their make-up and sunscreens and wherever possible use cream or serum-based products and sebum-regulating ingredients such as L-carnitine, nicotinamide and dimethicone. Targeted lesional treatment can be achieved using a topical retinoid or benzoyl peroxide cream. For recalcitrant or severe “maskne”, conventional treatments (topically and/or systemically) for acne vulgaris might be required under the auspices of a dermatologist.<sup>1</sup>

COVID-19 presents a distinctive challenge to dermatologists since masks are a key part of defence against this disease. As masks become a normal part of society, enforceable by law in many places, it is likely that dermatologists will see many more patients suffering from “maskne”. Appropriate and clear explanation of the mechanisms behind this condition as well as appropriate skincare and treatment advice will lead to reduced anxiety and better treatment compliance.

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