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Letter to the Editor

Comfort and compliance with the use of facemasks during COVID-19 infection

Dear Editor,

I found very interesting the article wrote by Swennen et al.¹ about custom-made 3D-printed face masks. The fabrication of this prototype is a promising idea and is a feasible alternative since medical, N95 and FFP2/3 masks are in shortage in different countries².

With respect to the authors, what I found essential before its massive production is its use in real-life situations. The reliability of mask not only depends on face seal leakage but also on its correct use, compliance and fitting³.

Healthcare workers (HW) have to wear a mask for long periods and if the person feels discomfort wearing it, it would affect the compliance during its use. The discomfort experienced by HW has been associated with tight-fit models⁴. It was previously demonstrated that flat fold N95 respirators offer and enhanced facial comfort without compromising its protection level⁵.

In my opinion, the idea is motivating but I should recommend the fabrication of a thinner mask to enhance general comfort in HW.

It is also important to scan the face in neutral and while performing typical facial expressions as smiling, these facial movements may increase contact pressure at the chin⁶.

Seal leakage, fitting, and compliance have to be validated in future studies. Since there is a lack of time to perform them, I strongly recommend the fabrication of thin-

ner custom-made 3D-printed facemasks and the use of face visors as a barrier.

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None.

Competing interests

Nothing to declare.

Ethical approval

Not applicable.

Patient Consent

Not applicable.

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Reply to Letter to the Editor “Comfort and compliance with the use of facemasks during COVID-19 infection”

We thank the author for their letter. The author correctly states that it is es-

sential to use the mask in real-life situations before its widespread production. This is indeed correct, and no mask should be used until proven safe and not to cause complications, in particular dermatological issues.

The original article clearly stresses the importance of testing the prototypes of the mask and the fit of the mask against the face, as well as the fit of the filter in the filter holder¹. This could be done with calibrated tests used by regulatory bodies

to approve the safety of masks used in industrial or clinical circumstances. The fit of the mask could be tested on the person for whom it was made and/or on a three-dimensional (3D) print of that face. The filter mentioned in the article has a CE mark and is approved for use.

Only when this has been approved could one use the mask for a trial in clinical circumstances to verify comfort and any arising dermatological issues.

The mask has a rigid contour and as such does not adapt to facial expressions. However, we are currently testing a third disposable component consisting of a removable malleable edge along the contour of the mask to adapt to facial expressions and improve comfort.

The thickness of the mask is partially related to the material used, which is not porous and can be disinfected. Obviously further refinements can be made.

The article does not mention face shields, as this was a proof-of-concept study on the mask itself. Of course, the custom-made 3D printed mask could be

combined with commercially available or self-made face shields.

Obviously it will be interesting to see reports in the future on the validity of using 3D imaging as the sole source for printing reusable custom-made 3D printed masks and how this principle can evolve in the future.

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Author G. R. J. Swennen has a potential conflict of interest having a minor stock ownership in 3D Infinity. P. E. Haers has no conflict of interest to declare.

Ethical approval

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Patient consent

Not required.

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