

## A simple solution to prevent microscope eyepiece fogging and spectacle fogging in COVID-19 era

Dear Editor:

Despite brisk and extensive developments in ocular surgery,<sup>[1]</sup> surgeons continue to face the problem of recurrent fogging of their spectacles and microscope eyepieces while performing surgery.<sup>[2]</sup> With surgeons now wearing masks and face shield to protect against COVID-19, fogging seems to be a major issue. This has emphasized the need for maintaining surfaces devoid of fogging. The lens fogging occurs due to an imbalance between the temperature of the eyepiece, airway cavity, and relative humidity of the environment resulting in condensation of small water droplets [Fig. 1a and b].<sup>[3,4]</sup> Some of other challenges faced by the surgeons are reduced stereoacuity, fogging of teaching binoculars (side-scope), application of a plastic tape over the surgical mask before surgery [Fig. 1c] and also lowering the upper mask strap to encourage easy breathing [Fig. 1d].

For our rescue, the medical grade anti-fog solutions [Fig. 2a] have come as a boon. The anti-fog solution can be easily procured as a spray or pre-moistened towelette from the market at an inexpensive cost. They work by reducing the surface tension, allows formation of a uniform film of water and improves clarity.<sup>[5]</sup> This also ensures no scratches on the optical devices. The solution is applied with a sterilized dry cotton swab or sprayed directly onto the eyepiece [Fig. 2b] and then, the eyepiece is cleaned with a sponge provided with the solution and allowed to dry [Fig. 2b]. The big advantage is that the solution holds good for approximately 6 hours.

Hence as a result, surgeons have noted a clear, unobstructed view throughout their cases. The spectacled surgeons have found it very beneficial during the surgical procedures as there is no need for regular plastic tape application. As our medical team members are wearing masks throughout the examination, this can also be a solution for fogging in face shield, slit lamp eyepieces, fundus lenses, refraction lenses, and glasses.

One of its limitations is that the solution can't be sterilized. In future, if we find a way to sterilize it, can also be tried for Vitreoretinal surgeries using a Binocular Indirect Ophthalmo



**Figure 1:** (a) Image depicting fogging of microscope eyepiece lenses with the condensation of small water droplets (white arrowhead). (b) Image depicting fogging of spectacle lenses while performing routine ophthalmic surgery (black arrowhead). (c) Image depicting the application of the plastic tape over the surgical mask by the ophthalmic surgeon before starting the surgery to prevent fogging (black arrowhead). (d) Image depicting the surgeon lowering the surgical mask strap to encourage breaths to escape downward (black arrowhead)



**Figure 2:** (a) Image depicting medical-grade anti-fog solution with an anti-scratch sponge for cleaning the microscope eyepieces. (b) Image depicting microscope eyepiece being cleaned with an anti-scratch sponge after anti-fog solution application (black arrowhead)

Microscope (BIOM, Oculus, Wetzlar, Germany). This simple innovative and reproducible technique may help maximize surgical output, minimize complications during ophthalmic surgery and will be a boon for health care workers during this growing coronavirus pandemic.

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