

Letters to Editor

Are the users of Valved N95 masks ‘innocent spreaders’ of COVID-19?

Dear Editor,

The N95 respirators (and equivalent FFP-2 respirators) also called as filtering facepiece respirators provide the best protection against particles up to 0.3 microns, including the SARS-CoV-2.^[1] These masks are better than surgical masks for self-protection and are recommended for health care workers. These respirators come in various shapes and types such as cone and cup shape and some of them are the valved variety [Figure 1a].^[2] The respirator has to fit snugly on the skin and should not allow air to pass from the sides after the usual fit check and seal check is performed. A poorly fit respirator can cause harm to the wearer in terms of inhalation of air from the sides thus exposing him to the risk of infection.^[3]

The valved variety is more comfortable for the wearers for long term use since exhalation is less labored and air can flow out in one direction, which is outwards.^[2] This fulfills the purpose of the wearer as no unfiltered air flows in and exhalation is more comfortable. However, we feel that the valve of N95 mask puts the accompanying healthcare worker at greater risk than with the non-valved N95 mask.

It is known that high pressure nebulization and use of non-invasive positive pressure ventilation can generate aerosols which can travel longer distance and are hazardous for the bystanders.^[4] For this reason, their use is avoided in diagnosed and suspected COVID patients, especially in closed areas like the wards and ICUs. The valved masks can be considered as similar mini aerosol generators in the hospital setting as can be seen in [Video 1] on how the valve is opening up to allow exhaled air to gush out. There is also growing awareness about airborne transmission of SARS-CoV-2 via aerosolized droplets, especially in a hospital setting.^[5] The valve in N95 mask causes a possible Venturi effect of the exhaled air since it passes through a small outlet and so causes greater

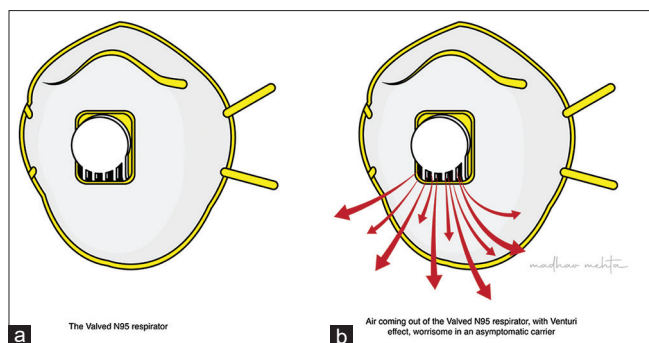


Figure 1: (a) The Valved N95 Respirator (b) Air coming out of the Valved N95 Respirator, with Venturi effect, worrisome in an asymptomatic carrier

aerosolization in case the wearer talks, coughs or sneezes [Figure 1b]. If this wearer is a COVID carrier, at times asymptomatic, it will result in much greater risk to others in that work environment.^[6]

It is therefore, recommended that the valved N95 masks should not be used and only non-valved masks should be used. These go against the principle of “my mask protects you and your mask protects me”, which is the basis of the recommendation that all need to wear masks. Even in general public, one sees valved respirators being used which can be harmful to the surrounding persons. The Hippocratic principle of “At First, Do No Harm” is defeated with these valved N95 masks which are good and comfortable for the wearer but can be more harmful for those around.

We have known of healthcare workers getting infected by COVID-19 despite taking utmost precautions. No disease in the realm of mankind has caused more morbidity and mortality of healthcare workers than SARS-CoV-2.

These valved masks need to be banned for this reason and only the non-valved N95 masks should be used during the pandemic. In case of shortage of supplies, a simple 3-ply surgical mask may be used to cover the valved mask.

The authors want to put on record a YouTube video made by the first author (link: <https://youtu.be/DcgY9iZN-xw>) dated May 4th, 2020, in which he demonstrates in detail about the problem with the valved respirator mask and talks about potential aerosolized spread by the asymptomatic carrier. This has become more relevant now as the Director General Health Services, Government of India has warned against use of valved masks calling them detrimental to the measures adopted in preventing the spread of SARS-CoV-2.^[7]

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Conflicts of interest

There are no conflicts of interest.

**Ashvind Bawa, Gurpreet S. Wander¹,
Ramit Mahajan²**

Department of Surgery, Dayanand Medical College & Hospital, ¹Department of Cardiology, Hero DMC Heart Institute, ²Department of Gastroenterology, Dayanand Medical College & Hospital, Ludhiana, Punjab, India

Address for correspondence: Dr. Ashvind Bawa,
Department of Surgery, Dayanand Medical College and Hospital,
Ludhiana, Punjab, India.
E-mail: drbawa@gmail.com

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