

Hospitals turn to snorkel masks to ease respirator overload

March 29 2020, by Marc Burleigh



A medical worker tests a Decathlon snorkeling mask, with a 3D-printed respiratory valve fitting attached, at the Erasme Hospital in Brussels

As hospitals face an overload of COVID-19 patients struggling to breathe, innovative medical staff are turning to snorkelling masks from

sports stores to stop their lungs collapsing.

The idea started in Italy, the European country worst-hit by the [coronavirus](#) pandemic, with hospitals in other nations taking note and adding their own specific medical parts to make it work.

One such is the Erasme Hospital on the outskirts of Belgium's capital Brussels. It is attached to the city's ULB university—and through it to a private spin-off, Endo Tools Therapeutics, whose knowhow in 3D printing for [medical use](#) has proved invaluable.

"They are to be used for patients with severe respiratory problems. The aim is to avoid having to intubate the trachea of the patient and put them on a respirator," said Frederic Bonnier, a respiratory physiotherapist at the hospital who also teaches at the university.

He spearheaded the design of a custom-made valve that fits to the top of full-face [masks](#), where the snorkel is meant to go, allowing them to connect to standard BiPAP machines that feed pressurised air into masks.

This helps prevent the collapse of alveoli, lung air sacs needed for the intake of oxygen into our bodies and the exhalation of carbon dioxide. Pneumonia brought on by COVID-19 inflames the lung membrane and fills those sacs with liquid.



The snorkelling mask solution could be a stop-gap measure for patients on the brink of intensive-care treatment but for whom no beds nor respirators are available

Stop-gap solution

In the worst-case infections, patients have to be hooked up to respirators in intensive-care units.

But respirators are in desperately short supply worldwide because of the sheer number of patients.

The snorkelling mask solution could be a stop-gap measure for patients on the brink of intensive-care treatment but for whom no beds nor

respirators are available. Hospital masks for the less-intensive BiPAP (bilevel positive airway pressure) machines are also lacking.

Bonnier said that from Monday he will testing 50 of the masks on patients.

They are the same brand as those used by Italian doctors, donated by the French sportswear retailer Decathlon that has stores worldwide. The masks themselves are made in Italy.

He explained they were far more comfortable than the [hospital](#) ones that fit over the nose and mouth, biting into the skin. But he cautioned they were not tested to medical standards, meaning they were one-use only, unable to be sterilised between patients.



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The Italian design for the 3D-printed valve also needed reworking.

"It seemed fairly complicated to make, pretty heavy, not very comfortable. So we had the idea to go a little further by thinking on it and developing our own connection part," he said.

The new plastic valve connectors have now been 3D-printed and are ready to be tested.

Bonnier added that [health workers](#) in COVID-19 wards could also use the masks for protection against the virus. But he fears the public will start panic-buying them, thereby depriving hospitals of a potentially life-saving product.

He also said that, even if the tests prove conclusive, there were still questions about how many such masks could be made available by sporting companies, under what conditions.

Retailer cautious

Learning of the emergency use being made of its snorkelling masks, Decathlon expressed "interest"—but also prudence.

"At the moment we don't have confirmation that these solutions really work," it said on its Twitter account.

"If we see successful try-outs, and these hospitals confirm to us that some tests work, then we'll keep you informed. But in the meantime, beware of unsourced and unverified information spread on social media in recent days."

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