

Respiratory discovery could improve survival of COVID-19 intensive care patients

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A clinical trial by the University of Southampton and University College London has revealed one reason why COVID-19 patients on ventilators have trouble breathing, and how refining a treatment could help save

lives.

The COVID-19 virus latches onto cells deep in our lungs that produce [surfactant](#)—a complex mixture which lines our lungs' air sacs and is essential for breathing.

The research team, led by Dr. Ahilanandan Dushianthan, Professor Mike Grocott, Professor Tony Postle and Professor Howard Clark has shown COVID-19 patients on ventilators had less surfactant, and discovered why giving extra surfactant doesn't always work.

They suggest that, by giving surfactant for longer, more intensive care patients could survive.

Why is surfactant important?

Surfactant helps to reduce the surface tension of water that lines the air sacs of the lungs, making it easier to breathe.

It was first found to be important in premature babies, who have less surfactant when they are born. This can lead to a condition known as Infant Respiratory Distress Syndrome, which is routinely treated successfully by given artificial surfactant to top up their surfactant levels and help them breathe more easily. A similar condition in adults, known as Adult Respiratory Distress Syndrome (ARDS), affects critically ill patients with severe COVID-19.

Rapid turnover of surfactant

This new pilot study, showed that 10 COVID-19 patients with ARDS who were on ventilators at University Hospitals Southampton or University College London Hospital had less surfactant than healthy people.

The investigators gave the patients Alveofact, a surfactant often used to treat [premature babies](#), as a fine mist into their lungs, and studied how the composition of the surfactant changed.

Surfactant is naturally absorbed and replaced by the body over time. But their results, published in the *American Journal of Respiratory and Critical Care Medicine*, show a particularly rapid turnover of the artificial surfactant. It is the first study to show this in COVID-19 patients.

This rapid turnover could explain why the benefits of giving replacement surfactant only last for a short while. Giving it for a longer period, they suggest, could help save lives.

Dr. Dushianthan, a consultant in general intensive care at University Hospital Southampton, said: "This has very significant implications for the design of future treatments for severe COVID-19. We found that replacement surfactant rapidly cleared with a half-life of about seven hours. This indicates that multiple surfactant doses over a number of days will be required to support breathing while the lung cells repair after the infection passes."

More information: Anthony D Postle et al, Rapid Phospholipid Turnover After Surfactant Nebulization in Severe COVID-19 Infection: A Randomized Clinical Trial, *American Journal of Respiratory and Critical Care Medicine* (2021). [DOI: 10.1164/rccm.202110-2279LE](https://doi.org/10.1164/rccm.202110-2279LE)

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