

2021

Commentary: Covid 19: Don't Throw Caution to the Wind Nor Air Leak. Use PPE!

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Recommended Citation

Lazzaro RS, Inra ML, Patton B. Commentary: Covid 19: Don't Throw Caution to the Wind Nor Air Leak. Use PPE!. . 2021 Jan 01; ():Article 7678 [p.]. Available from: <https://academicworks.medicine.hofstra.edu/publications/7678>. Free full text article.

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Commentary: Covid 19: Don't Throw Caution to the Wind Nor Air Leak. Use PPE!

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This past year, the COVID-19 pandemic has upended the lives of nearly every person worldwide with millions of reported cases and hundreds of thousands of deaths. As a novel virus, little is known about its mode of transmission however, there is increasing evidence that airborne transmission via droplets is an important factor but the role of aerosols remains controversial.¹ Most experimental studies have focused on aerosol-generating procedures such as bronchoscopy, endotracheal intubation, and positive pressure ventilation via face mask. Personal protective equipment (PPE) is recommended for these procedures including gown, gloves, eye protection, and N-95 mask. Little evidence is available regarding the risk to healthcare workers in the special circumstance of a patient with a chest tube and air leak.

In this original article, Mustaev and colleagues sought to define the degree of aerosolization from chest tube drainage systems in the context of the COVID-19 pandemic.² They conceptualized and developed a novel simulation model for measuring aerosol generation by agitating a fluorescent fluid with different air flow rates. The aerosolized particles were measured under ultraviolet light. They concluded that the single chamber chest drainage system is much more likely to generate aerosols than a 3-chamber or digital drainage system and therefore, single chambers should not be used in patients with air leak.²

Other researchers have detected that even loud speech can “emit thousands of oral fluid droplets per second” using highly sensitive laser light scattering observations.³ This technique and others allow for measurement of droplets as small as 0.5 μm . In the authors’ study, the smallest droplet detected measured 56 μm with a mean size of 152 μm suggesting that many smaller droplets may not have been detected with their simulation and that the degree of aerosol generation is underestimated.

But merely demonstrating that speech or air leaks generate aerosols does not prove transmissibility. Infection is dependent on “the route of exposure, the size of the inoculum, the duration of the exposure, and host defenses.¹” Another study aerosolized SARS-CoV-2 and found that the virus “retained infectivity and



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Central Message

Three chamber or digital drainage systems should be used in patients with suspected or proven COVID-19 with air leaks to minimize aerosolization and contamination of the environment but are not a substitute for PPE.

virion integrity for up to 16 hours in aerosols” and “may be a more important exposure transmission pathway than previously considered.⁴” The jury is still out on the impact of airborne transmission in the non-simulated, real world but these factors must be considered in protecting those at risk of exposure.

While this article is immediately relevant to many thoracic surgeons and other healthcare personnel across the globe, it is clear that PPE is required when in close proximity to patients with suspected or proven COVID-19. These patients are at increased risk of pneumothorax and bronchopleural fistula requiring chest tube drainage with prolonged air leaks. Three chamber or digital drainage systems should be used in this setting to minimize aerosolization and contamination of the environment but are not a substitute for PPE. Don't throw caution to the wind nor air leak.

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Conflicts of Interest: None.

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DOI of original article: <http://dx.doi.org/10.1053/j.semtcvs.2020.10.002>.