



COVID-19: KEEPING UP WITH A MOVING TARGET

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Sam Matta RN, CFRN, NRP
Critical Care Transport Nurse
Johns Hopkins Hospital Lifeline
Baltimore, MD



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for Medicine



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Sam Matta, RN, CFRN, NRP	None

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Learning Objectives

- Describe what high flow nasal cannula (HFNC) is and why it works.
- Discuss how HFNC has been employed in the COVID-19 patient population.
- Describe how the Lifeline team employs HFNC and its rapid deployment of the therapy.





Thank You

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What is High Flow Nasal Cannula (HFNC)

- Extremely simple
 - An air/oxygen blender
 - A way to heat/humidify
 - A nasal cannula
- The blender can deliver
 - An $F_{I}O_{2}$ from 0.21 to 1.0
 - Flows of up to 60 L/min.
- Noninvasive ventilation (NIV) vs HFNC
 - NIV increases anatomical dead space
 - HFNC decreases dead space



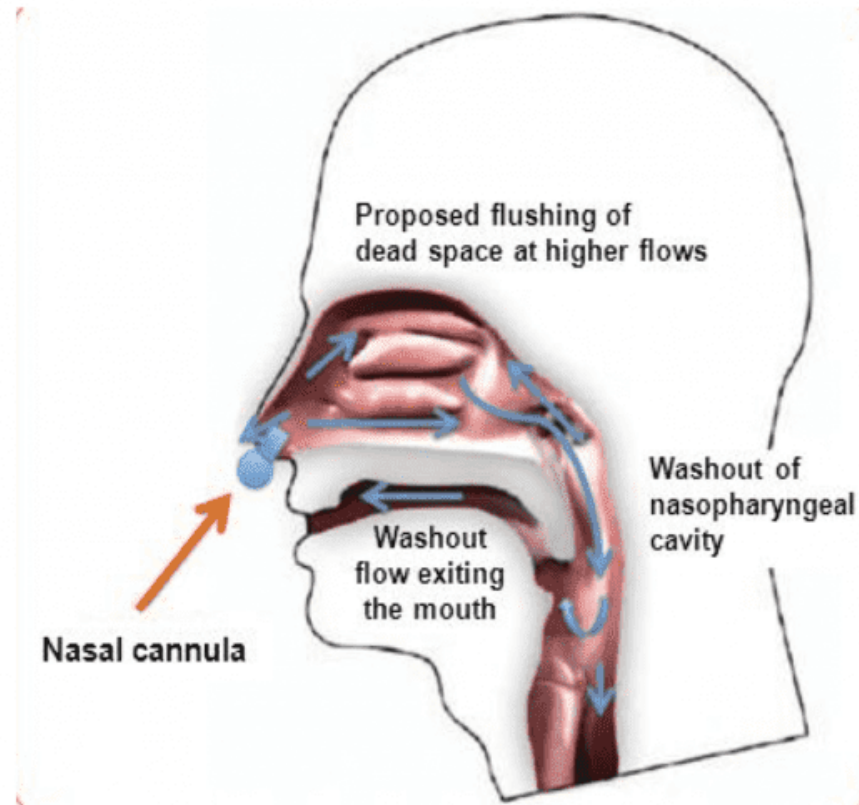
Physiological Effect

High flow washes out carbon dioxide in anatomical dead space

Continuous high flow oxygen washes out the upper airways

Reservoir of oxygen in upper airway (pharynx) available for gas exchange

Avoids rebreathing of CO₂ and therefore decreases anatomic dead space



<https://rebelem.com/high-flow-nasal-cannula-hfnc-part-1-how-it-works/>





Physiological Effect

- A little bit of PEEP
- Consistent of FiO_2
- Mucociliary functions remain intact

Nishimura, M. High-flow nasal cannula oxygen therapy in adults. *j intensive care* **3**, 15 (2015). <https://doi.org/10.1186/s40560-015-0084-5>



Does HFNC Work in Hypoxia?



The FLORALI Trial

The **NEW ENGLAND**
JOURNAL *of* **MEDICINE**

ESTABLISHED IN 1812

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High-Flow Oxygen through Nasal Cannula in Acute Hypoxemic Respiratory Failure

Jean-Pierre Frat, M.D., Arnaud W. Thille, M.D., Ph.D., Alain Mercat, M.D., Ph.D., Christophe Girault, M.D., Ph.D.,
Stéphanie Ragot, Pharm.D., Ph.D., Sébastien Perbet, M.D., Gwénael Prat, M.D., Thierry Boulain, M.D.,
Elise Morawiec, M.D., Alice Cottreau, M.D., Jérôme Devaquet, M.D., Saad Nseir, M.D., Ph.D., Keyvan Razazi, M.D.,

Intubation rates:

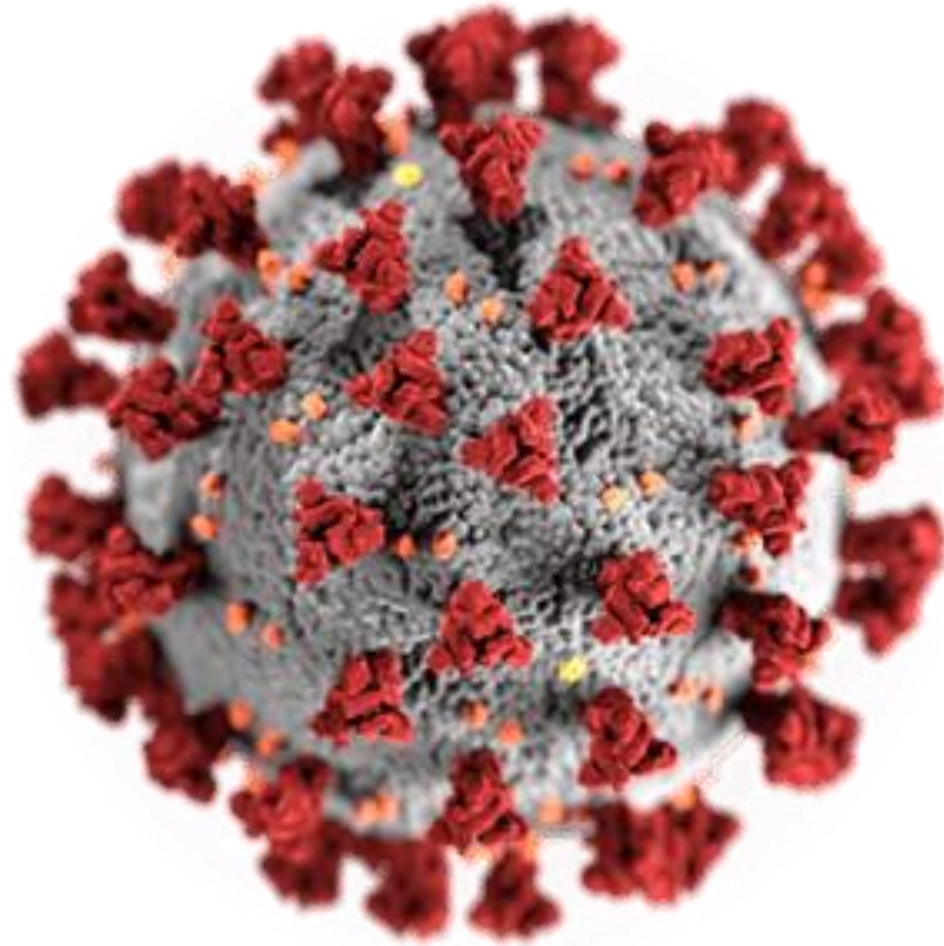
HFNC: 38%

Standard: 47%

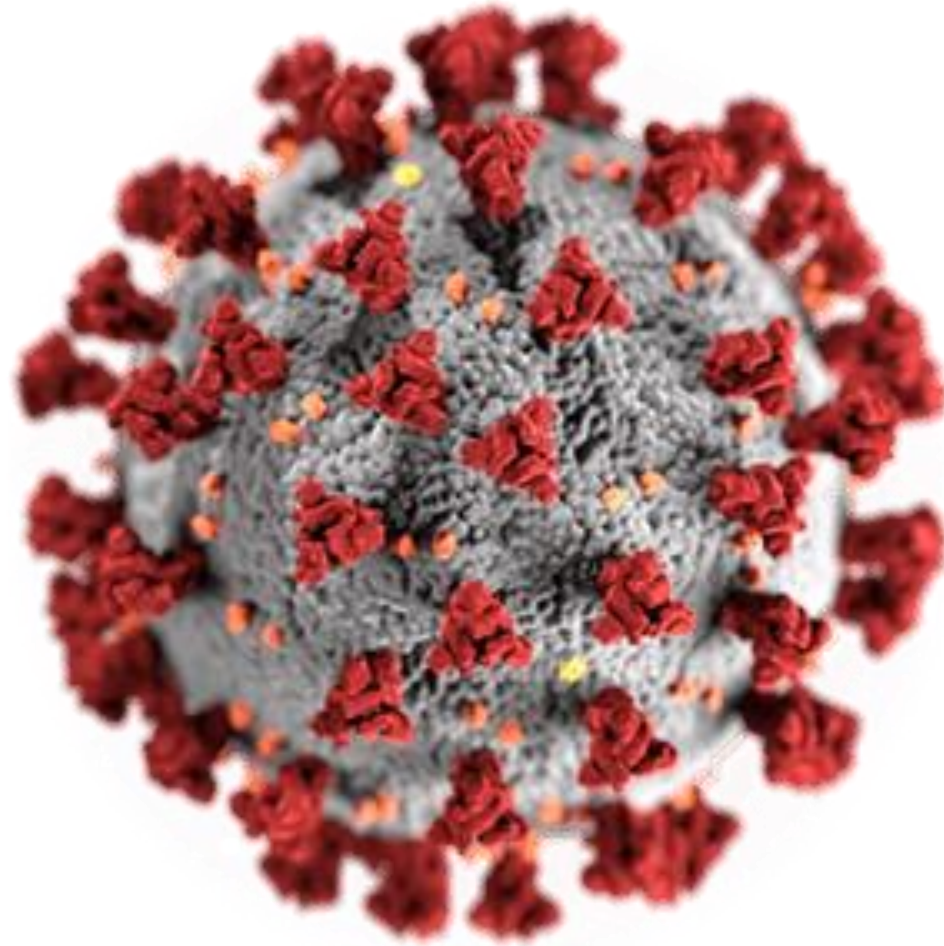
Noninvasive positive pressure: 50%



HFNC and COVID



Aerosol Risk with HFNC



A Non-rebreather is Worse!!

TABLE 1 Summary of exhaled smoke dispersion distances with different oxygen devices

Oxygen device	Flow rate L·min ⁻¹	Dispersion distance cm	Ref.
HFNC	60	17.2±3.3	[6]
	30	13.0±1.1	[6]
	10	6.5±1.5	[6]
Simple mask	15	11.2±0.7	[7]
	10	9.5±0.6	[7]
Non-rebreathing mask	10	24.6±2.2	[7]
Venturi mask at $F_{I_{O_2}}$ 0.4	6	39.7±1.6	[7]
Venturi mask at $F_{I_{O_2}}$ 0.35	6	27.2±1.1	[7]

Summary of studies evaluating oxygen delivery devices using a high-fidelity human simulator with smoke particles of <1 µm (an aerosol of solid particles). The smoke was illuminated by a laser light-sheet and high-definition video was used to measure dispersion distance away from the manikin. Indicated dispersion distances give an idea of proximity of contaminated bio-aerosols, to which healthcare workers may be directly exposed. HFNC: high-flow nasal cannula; $F_{I_{O_2}}$: inspiratory oxygen fraction.

Li et al. Eur Respir J 2020



Lifeline Deployment

- T1
- Heaters
- Protocol





To submit your own question, please email QA@dkbmed.com





What are some common complications seen in the deployment of HFNC therapy?





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- QA@dkbmed.com

