HIGH FLOW NASAL CANULA O2 HELPFUL OR JUST A BUNCH OF HOT AIR?

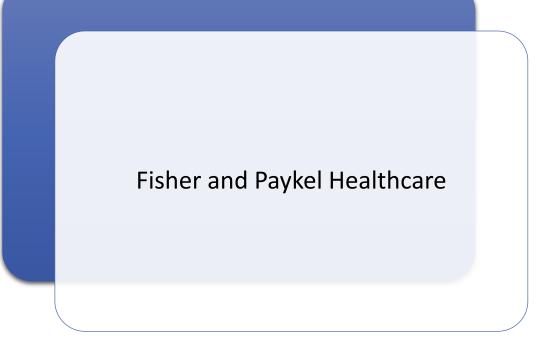


- James Neuenschwander MD. FACEP. FASAM
- Attending Physician
- Doctors Hospital Emergency Department
- Columbus, Ohio
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- 24 August 2023

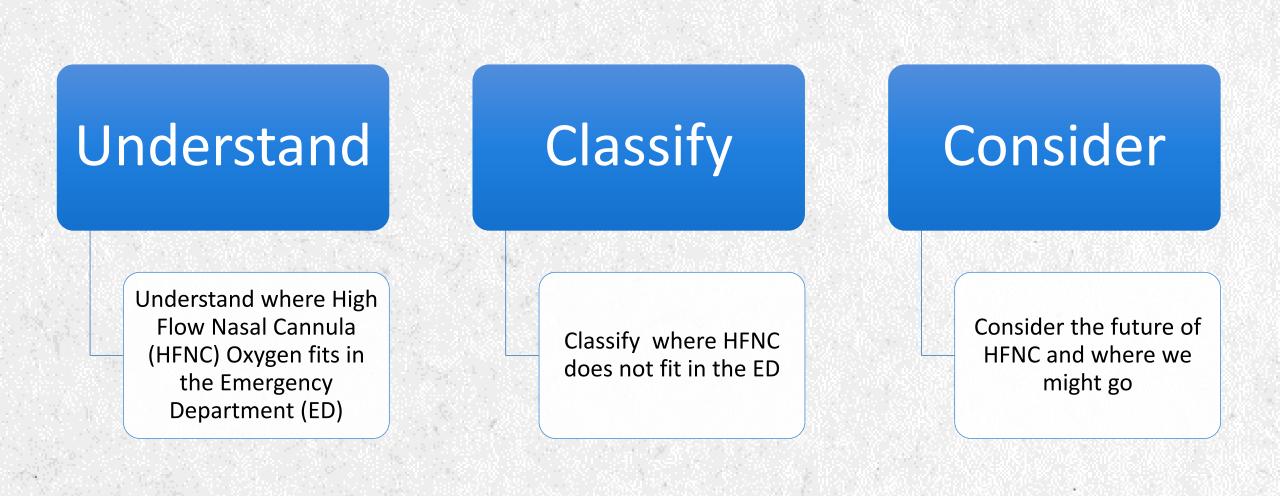


DISCLOSURES

Consultant and/or speaker Janssen. AZ. ThermoFisher. Abbott. Ortho Diagnostics. CSL Bridgesource. Aseptiscope. Siemens



OBJECTIVES



CASE STUDY 1

68 yo male with history of COPD brought in by squad for SOB on Bipap Vitals. HR 117. BP 157/84 RR 28. Temp. 99.3 Pulse ox 88% on 2 liters NC

PMHx. COPD. HTN. DM.

Meds. Lisinopril Metformin. Albuterol.

Placed on bed and put on High Flow Nasal Canula Labs. Covid and Influ swabs. VBG EKG unremarkable Infiltrate in Left Iower Iobe. Given Rocephin. Zithro

Steroids for COPD exacerbation

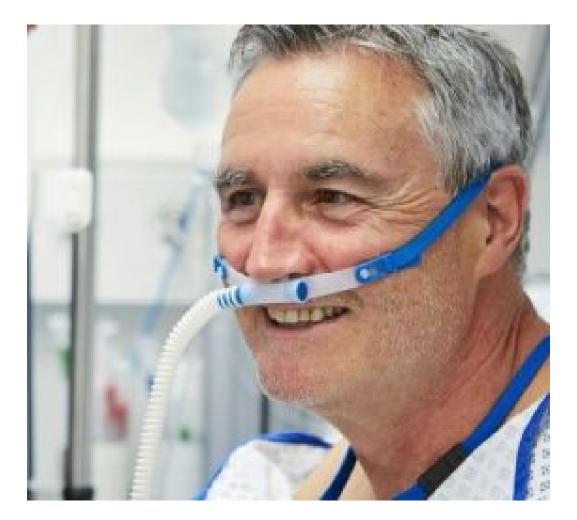
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DEPARTMENT (ED)





WHERE HIGH FLOW OXYGEN FITS IN THE EMERGENCY DEPARTMENT.



- Does this guy look happy with our care?
- Can he tell us about his history?
- What if he wants to eat?
- What if he vomits what he ate?
- What if he wants to poop?

WHAT DOES HIGH FLOW NC DO FOR US?

- Deliver up to 100 % humidified and heated O2
- Better control over delivery of O2
- Avoids drying of passages and mucosal irritation
- Condensation is minimized as O2 is delivered via heated tubes via wide-bore nasal prong





HOW WE THINK HFNC WORKS

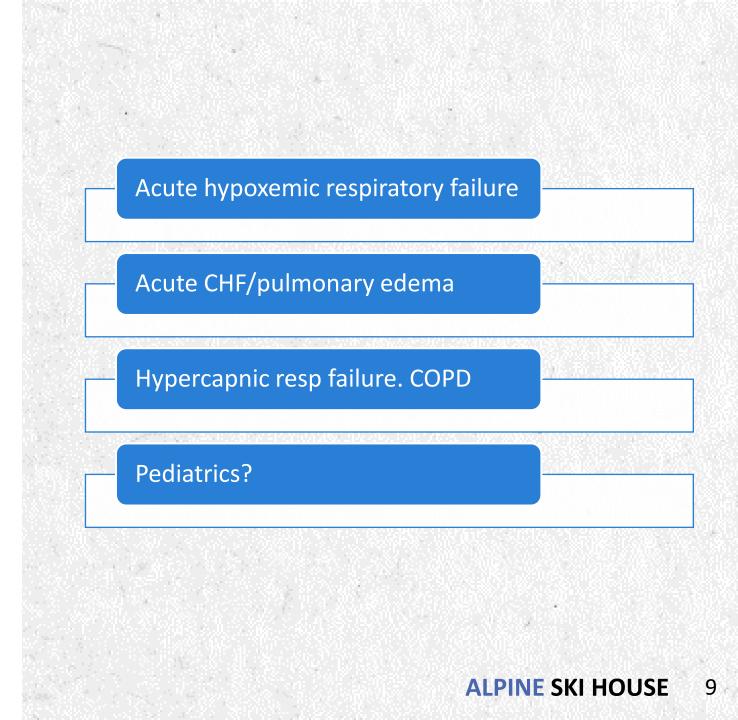
- Physiologic dead space waste gases are washed out increasing ventilation and displacing CO2 excess and allowing for excess of O2
- Decreased RR.

PEEP

•

- Increased tidal volume
- Increased end expiratory volume

WHERE CAN WE USE IT?





68 yo female with history of COPD intubated for respiratory distress.

Went to the ICU and extubated.

Started to fatigue and went onto bipap

Switched to HFNC and improved.



DOES IT REDUCE INTUBATION AND DECREASE MORTALITY?

11



Mixed results

As good as NIV?

HIGH-FLOW OXYGEN THROUGH NASAL CANNULA IN ACUTE HYPOXEMIC RESPIRATORY FAILURE

JEAN-PIERRE FRAT, M.D., ET AL FLORALI STUDY GROUP AND THE REVA NETWORK*

CONCLUSIONS

In patients with nonhypercapnic acute hypoxemic respiratory failure, treatment with high-flow oxygen, standard oxygen, or noninvasive ventilation did not result in significantly different intubation rates. There was a significant difference in favor of high-flow oxygen in 90-day mortality.

HIGH-FLOW NASAL CANNULA OXYGEN THERAPY VERSUS NON-INVASIVE VENTILATION FOR CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS AFTER EXTUBATION: A MULTICENTER, RANDOMIZED CONTROLLED TRIAL DINGYU TAN

Conclusion

Among COPD patients with severe hypercapnic respiratory failure who received invasive ventilation, the use of HFNC after extubation did not result in increased rates of treatment failure compared with NIV. HFNC also had better tolerance and comfort than NIV.

NASAL HIGH FLOW IN THE ED: CLINICAL STUDIES SUMMARY



WHAT IS THE CLINICAL EVIDENCE SPECIFIC TO THE ED?

Nasal high flow can decrease the need for escalation and might decrease the need for intubation

(Meta-analysis; nasal high flow compared with COT and NIV)

- Huang, et al. Emerg Med Int. 2019.

"Patients with HFNC were much more likely to recover from respiratory failure."

(Compared with COT in patients with acute hypoxemic respiratory failure)

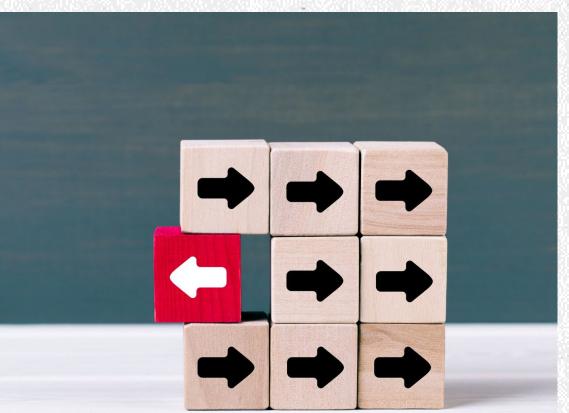
- Mace, et al. Am J Emerg Med. 2019.

ALPINE

LIMITATIONS OF HIGH FLOW NASAL CANULA

• Expense

- Increased complexity and training required.
- Risk of ineffective seal of the passageways leading to leaking
- Delay intubation
- Potential to delay end-of-life decisions
- Barotrauma?



CAN WE USE IT IN PATIENTS WITH?

Altered mental status	
Facial injuries	
Excessive secretions.	
Risk of aspiration before HFNC	
Hemodynamic instability	
Skin breakdown around ears	



THE FUTURE

Can we use this with patients needing Bipap? Can we use this instead of Bipap? Can we put this on EMS rigs? Can pediatric patients benefit?

OBJECTIVES

Understand

 Understand where High Flow Nasal Cannula (HFNC) Oxygen fits in the Emergency Department (ED)

Classify

• Classify where HFNC does not fit in the ED

Consider

 Consider the future of HFNC and where we might go



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

Jean-Pierre Frat, M.D., et al FLORALI Study Group and the REVA Network June 4, 2015 N Engl J Med 2015; 372:2185-2196. DOI: 10.1056/NEJMoa1503326

Tan, D., Walline, J.H., Ling, B. *et al.* High-flow nasal cannula oxygen therapy versus non-invasive ventilation for chronic obstructive pulmonary disease patients after extubation: a multicenter, randomized controlled trial. *Crit Care* 24, 489 (2020). <u>https://doi.org/10.1186/s13054-020-03214-9</u>

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THANK YOU

Jim.Neuen@gmail.com

QUESTIONS?

Jim.Neuen@gmail.com

OBJECTIVES

Discuss	Discuss where High Flow Oxygen fits in the Emergency Department.	
Outline	Outline where HFNC does not fit	
Consider	Consider Consider future of HFNC and where we might go	

DOES IT REDUCE INTUBATION AND DECREASE MORTALITY?

Mixed results

As good as NIV?



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

Jean-Pierre Frat, M.D., et al FLORALI Study Group and the REVA Network^{*}



<u>June 4, 2015</u> N Engl J Med 2015; 372:2185-2196 DOI: 10.1056/NEJMoa1503326 In patients with nonhypercapnic acute hypoxemic respiratory failure, treatment with high-flow oxygen, standard oxygen, or noninvasive ventilation did not result in significantly different intubation rates. There was a significant difference in favor of high-flow oxygen in 90-day mortality.

HOW WE THINK HFNC WORKS

Physiologic dead space waste gases are washed out increasing ventilation and displacing CO2 excess and allowing for excess of O2

Decreased RR.

PEEP

Increased tidal volume

Increased end expiratory volume



HIGH-FLOW NASAL CANNULA OXYGEN THERAPY VERSUS NON-INVASIVE VENTILATION FOR CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS AFTER EXTUBATION: A MULTICENTER, RANDOMIZED CONTROLLED TRIAL DINGYU TAN

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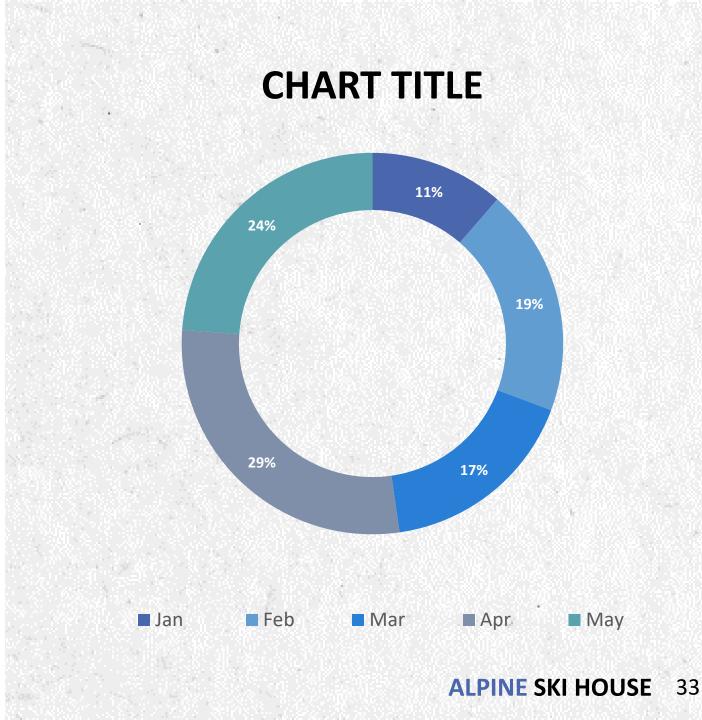


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