Online Supplement: Studies of Outcomes of Specific Oxygenation Target in Hospitalized Adult Subjects

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| Study | Study Design | Interventions | Subjects, *n* | Outcomes | Main Findings |
| Cameron et al 201216 | Retrospective review | Evaluation of oxygenation in AECOPD | G1 hypoxemic: 83  G2 normoxemic: 110  G3 hyperoxemic: 61 | Mortality, *n*(%):  G1: 5 (6.0)  G2: 7 (6.4)  G3: 5 (8.2)  Hyperoxemia OR 1.74  (95% CI, 0.46-6.50; *P* = .41)  Hypoxemia OR 1.47  (95% CI, 0.33-6.54; *P* = .61) | Mortality risk was not statistically significant between the hypoxemia and hyperoxemia groups, though other risk factors were present. |
| Echevarria et al 202017 | Prospective observational | Targeted SpO2 with COPD patients | G1: SpO2 87%, 147  G2: SpO2 88%-92%, 282  G3: SpO2 93%-96%, 375  G4: SpO2 97%-100%, 23 | In-hospital mortality, n (%):  G1: 25/147 (17), OR 2.17 (95% CI 1.19-3.96), *P* = .011  G2: 25/282 (8), ref  G3: 44/375 (12), OR 1.40 (95% CI 0.83-2.37), *P* = .205  G4: 38/223 (17), OR 2.18 (95% CI 1.26-3.77), *P* = .005 | In-hospital mortality was lowest in those with admission SpO2 between 88% and 92%. |
| Girardis et al 201611 | Single center randomized control trial | Conservative (PaO2 between 70-100 mmHg/ SpO2 between 94-98%) versus conventional (PaO2 up to 150 mmHg/ SpO2 between 97-100%) oxygen therapy in the ICU | G1 conservative: 216  G2 conventional: 218 | ICU LOS, *d*:  G1: 6 (4-10)  G2: 6 (4-11), *P* = .33  Hospital LOS, *d*:  G1: 21 (13-38)  G2: 21 (12-34), *P* = .21  ICU mortality, *n*(%):  G1: 25 (11.6)  G2: 44 (20.2), *P* = .01 Hospital mortality, *n*(%):  G1: 52 (24.2)  G2: 74 (33.9), *P* = .03 | A conservative protocol for oxygen therapy vs conventional therapy resulted in lower ICU mortality. |
| Hoffman et al 201718 | Randomized control trial | Supplemental oxygen versus ambient air in patients with MI with SpO2 90% or higher | G1 oxygen: 3311  G2 ambient air: 3318 | Hospital LOS, *d*:  G1: 3 (0-68)  G2: 3 (0-95), *P* = .87  Mortality, *n*(%):  G1: 53 (1.6)  G2: 44 (1.3), *P* = .35 | Routine use of supplemental oxygen in patients with suspected acute MI who did not have hypoxemia did not reduce 1-year all-cause mortality. |
| Joosten et al 200713 | Retrospective cohort | Comparison of patients with high PaO2 (>74.5 mm Hg) and low PaO2 (<74.5 mm Hg) | G1 high PaO2: 22  G2 low PaO2: 21 | Hospital LOS, *d*(SD):  G1: 11.18 + 10.36  G2: 5.91 + 2.59, *P* = .029  Mortality, *n*(%):  G1: 3 (14)  G2: 0 (0), *P* = .083 | Though higher PaO2 may lead to a higher LOS, the findings were not statistically significant. |
| van den Boom et al 200910 | Retrospective analysis | Correlation of SpO2 and time within SpO2 range | eICU-CRD database: 26,723  MIMIC database: 8,564 | Hospital mortality,  Median SpO2  AOR 92% vs 96%  3.2 (95% CI, 2.9-3.5)  AOR 100% vs 96%  1.6 (95% CI, 1.5-1.6)  80% vs 40% of SpO2 measures  AOR within 94-98% 0.42 (95% CI, 0.40-0.43)  AOR above 98% 1.19 (95% CI, 1.16-1.22) | The percentage of time patients were within the optimal range of SpO2 (94-98%) was associated with decreased hospital mortality. |

AECOPD = Acute exacerbation of chronic obstructive pulmonary disease  
ED = Emergency department  
MI = Myocardial infarction   
NRB = Non-rebreathing mask

Table 2: Studies of Outcomes of Specific Oxygenation Target in Critically Ill Hospitalized Adult Subjects

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| --- | --- | --- | --- | --- | --- |
| Study | Study Design | Interventions | Subjects, *n* | Outcomes | Main Findings |
| Pilcher et al 201724 | Randomized control cross-over | 60 minutes each of low FiO2 and higher FiO2 | G1 high FiO2: 24  G2 low FiO2: 24 | PtCO2, *mm Hg*:  G1: 44.4  G2: 41.3  Difference: 3.2  (95% CI, 1.3-5.2; *P* = .002) | High FiO2 increases PtCO2 in morbidly obese patients; recommend target SpO2 in this population of 88-92% |
| Sepehrvand et al 201920 | Randomized control trial | SpO2 range >96% versus SpO2 range 90-92% | G1 high SpO2: 24  G2 low SpO2: 24 | Hospital LOS, *d*;  G1: 4.7  G2: 9.5, *P* = .01  (after adjustment, no significant difference) | After adjustment for other variables, no difference in hospital LOS between high and low SpO2 range was noted in patients with acute heart failure. |
| Yu et al 202025 | Retrospective analysis | Analysis of database to determine the association between admission SpO2 levels and all-cause in-hospital mortality, and to determine optimal SpO2 range | G1: SpO2 94-96%  G2: SpO2 <94%  G3: SpO2 >96% | All-cause in-hospital mortality, hazard ratio, 95% CI  G1: REF  G2: 1.783 (1.433, 2.217), *P* <.001  G3: 1.495 (1.245, 1796), *P* <.001 | The optimal SpO2 range discovered was 94–96%, which was independently associated with increased survival in acute MI patients. |

HFNC: High flow nasal cannula  
LOS: Length of stay  
MI: Myocardial infarction  
SNP: Standard nasal prongs (low flow nasal cannula)

Table 3: Studies of Outcomes of Continuous Monitoring in Hospitalized Adult Subjects

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| --- | --- | --- | --- | --- | --- |
| Study | Study Design | Interventions | Subjects, *n* | Outcomes | Main Findings |
| Kisner et al 200938 | Retrospective cohort | Postoperative remote pulse oximetry monitoring | G1 remote monitoring: 119  G2 no remote monitoring: 238 | Incidence of atrial fibrillation, *n*(%):  G1: 22 (18)  G2: 66 (28), *P* = .056 | Patients with remote monitoring overall had a trend towards less incidence of atrial fibrillation |
| Taenzer et al 201836 | Observational | Overnight pulse oximetry + supplemental oxygen | G1 supplemental oxygen: 34  G2 room air: 33 | Percentage of time spent in desaturation, %:  G1: 18.6  G2: 27.1, *P* = .06  Speed of desaturation, | The speed of the desaturation and the transition time to a desaturation alarm state are not different between patients breathing room air versus supplemental oxygen. |

Table 4: Studies of Outcomes of Early Initiation of High Flow Oxygen in Hospitalized Adult Subjects

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| --- | --- | --- | --- | --- | --- |
| Study | Study Design | Interventions | Subjects, *n* | Outcomes | Main Findings |
| Gaunt et al 201539 | Retrospective analysis (heterogeneous population) | HFNC initiated in the ICU | 145, no control group | ICU LOS:  β 0.47, *P* <.001  Hospital LOS:  β 0.80, *P* = .003 | Number of days between initiation of HFNC were associated with increased ICU and post-ICU stay. |
| Lamb et al 201740 | Prospective cohort study | HFNC protocol post-extubation (cohort 1) or via escalation (cohort 2)  Comparator: retrospective HFNC pre-protocol implementation (both cohorts) | Cohort 1:  G1 protocol: 88  G2 pre-protocol: 88  Cohort 2:  G3 protocol: 83  G4 pre-protocol: 83 | ICU LOS, *d*:  G1: 7d (4-11)  G2: 7d (4-11), *P* = .79  G3: 3d (2-5)  G4: 4d (3-7), *P* = .03  Hospital LOS, *d*:  G1: 14d (9-23)  G2: 13d (8-22), *P* = .27  G3: 8d (5-14)  G4: 12d (7-20), *P* = .007  Escalation of care, *n*(%):  G3: 11 (13)  G4: 12 (15), *P* = .99 | In Cohort #2, when using HFNC early and per protocol, ICU and hospital LOS were reduced but had no impact on rate of escalation of care. |

HFNC = high flow nasal cannula  
ICU = intensive care unit  
LOS = length of stay

Table 5: Studies of Outcomes of High Flow Oxygen in Hospitalized Adult Subjects

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| --- | --- | --- | --- | --- | --- |
| Study | Study Design | Interventions | Subjects, *n* | Outcomes | Main Findings |
| Azoulay et al 201863 | Randomized control trial | Change in mortality with HFNC versus conventional oxygen therapy | G1 HFNC: 388  G2 conventional oxygen therapy: 388 | Escalation to MV, *n*(%):  G1: 150 (38.7)  G2: 170 (43.8), *P* = .17  ICU LOS, *d*:  G1: 8  G2: 6, *P* = .53  Hospital LOS, *d*:  G1: 24  G2: 27, *P* = .58  Mortality, *n*(%):  G1: 138 (35.6)  G2: 140 (36.1), *P* = .94 | No significant difference between HFNC or conventional oxygen therapy in escalation of care, length of stay, or mortality. |
| Bell et al 201541 | Prospective randomized control trial | Change in escalation of care in ED patients with HFNC versus conventional oxygen therapy | G1 HFNC: 48  G2 NC/FM: 52 | Escalation of care, *n*(%):  G1: 2 (4.2)  G2: 10 (19), *P* = .02 | No significant difference between HFNC or conventional oxygen therapy in escalation of care. |
| Corley et al 201558 | Randomized control trial | Extubation to HFNC versus extubation to conventional oxygen therapy | G1 HFNC: 81  G2 conventional oxygen therapy: 74 | ICU LOS, *mean hours* (SD):  G1: 38.65 (35.2)  G2: 38.64 (23.9), *P* = .99 | No significant difference between extubating to HFNC or conventional oxygen therapy in length of stay. |
| Dhillon et al 201757 | Retrospective review | Extubation to HFNC versus extubation to CM/NC | G1 HFNC: 46  G2 CM/NC: 138 | Reintubation, *n*(%):  G1: 3 (7.7)  G2: 19 (31.1), AOR 0.15 (95% CI, 0.03-0.70; *P* = .02)  ICU LOS, *d*(mean +SD):  G1: 13.6 +­ 11.7  G2: 8.3 + 9.9, *P* <.01  Hospital LOS, *d*(mean +SD):  G1:25.7 + 16.2  G2: 18.8 + 14.8, *P* <.01  Mortality, *n*(%):  G1: 1 (2.2)  G2: 11 (8.0), *P* = .3 | Patients extubated to HFNC were less likely to require escalation of care (reintubation) than those extubated to CM/NC. |
| Fernandez et al 201756 | Randomized control, multicenter trial | Extubation to either HFNC or conventional oxygen therapy | G1 HFNC: 78  G2 conventional oxygen therapy: 77 | Reintubation within 72h, *n*(%):  G1: 9 (11)  G2: 12 (16), *P* = .5  ICU LOS, *d*:  G1: 12 (7-25)  G2: 14 (9-7), *P* = .8  Hospital LOS, *d*:  G1: 27 (18-54)  G2: 27 (18-47), *p* = 1  ICU mortality, *n*(%):  G1: 6 (7.7)  G2: 7 (9.0), *P* = 1 Hospital mortality, *n*(%):  G1: 12 (15.4)  G2: 12 (15.6), *P* = 1 | No significant difference between extubating to HFNC or conventional oxygen therapy in escalation of care, length of stay, or mortality. |
| Frat et al 201551 | Prospective, multicenter, randomized controlled trial | Treatment of AHRF with either NRB, conventional oxygen therapy, or NIV | G1 HFNC: 106  G2 conventional oxygen therapy: 94  G3 NIV: 110 | Escalation of care (intubation), *n*(%):  G1: 40 (138)  G2: 44 (47)  G3: 55 (50), *P* = .18  ICU mortality, *n*(%):  G1: 12 (11)  G2: 18 (19)  G3: 27 (25), *P* = .047  90-day mortality, *n*(%):  G1: 13 (12) G2: 22 (23) G3: 31 (28), *P* = .02 | No significant difference in escalation of care (intubation rates) or ICU mortality among initial treatment with HFNC, COT, or NIV. Significant difference in favor of HFNC with 90-day mortality. |
| Frat et al 201661 | Post-hoc subgroup analysis of randomized control trial | Treatment of AHRF with HFNC or HFNC + NIV | G1 HFNC: 26  G2 HFNC + NIV: 30 | ICU mortality, *n*(%):  G1: 2 (2)  G2: 3 (3), *P* = .68  90-day mortality, *n*(%):  G1: 2 (2)  G2: 3 (3), *P* = .68 | HFNC lower intubation than NIV, no difference compared to COT |
| Futier et al 201649 | Randomized control, multicenter trial | Extubation to either HFNC or conventional oxygen therapy | G1 HFNC: 108  G2 conventional oxygen therapy: 112 | Escalation of care, *n*(%):  G1: 20 (19)  G2: 14 (13), *P* = .22  ICU LOS, *d*:  G1: 6 (4-16)  G2: 5 (3-13), *P* = .53  Hospital LOS, *d*:  G1: 12 (7-20)  G2: 11 (7-18), *P* = .58  Mortality, *n*(%):  G1: 2 (2)  G2: 3 (3), *P* = .68 | No significant difference between extubating to HFNC or conventional oxygen therapy in escalation of care, length of stay, or mortality. |
| Gaspari et al 202054 | Prospective observational study | Extubation to either HFNC or conventional oxygen therapy | G1: HFNC, 29  G2: conventional oxygen therapy, 29 | ICU LOS, median (IQR), days  G1: 6 (5-11)  G2: 6 (5-8), P = .36  Outcome: 28-day mortality, n (%)  G1: 2 (7)  G2: 3 (10), P >.99  Outcome: escalation of care (NIV or MV), n (%)  G1: 3 (10)  G2: 10 (34), P = .06 | The use of HFNC after extubation in patients with liver transplant did not differ in need for escalation of care, mortality, or ICU LOS. |
| Hernández et al 201652 | Randomized control, multicenter trial | Extubation to either HFNC or conventional oxygen therapy | G1 HFNC: 264  G2 conventional oxygen therapy: 263 | All-cause reintubation, *n*(%):  G1: 13 (4.9)  G2: 32 (12.2), *P* = .004  ICU LOS, *d*:  G1: 6 (2-8)  G2: 6 (2-9), *P* = .29  Hospital LOS, *d*:  G1: 11 (6-15)  G2: 12 (6-16), *p* = .76  ICU mortality, *n*(%):  G1: 3 (1.1)  G2: 3 (1.1), *P* = .99 Hospital mortality, *n*(%):  G1: 10 (3.8)  G2: 13 (5), *P* = .94 | No significant difference between extubating to HFNC or conventional oxygen therapy in length of stay or mortality, though extubation to HFNC may reduce risk of reintubation. |
| Hou et al 201953 | Prospective cohort | Extubation to either HFNC or conventional oxygen therapy | G1 HFNC: 160  G2 conventional oxygen therapy: 156 | Escalation to NIV, *n*(%):  G1: 8 (5)  G2: 19 (12.2), *P* = .0225  Reintubation, *n*(%):  G1: 6 (3.75)  G2: 15 (9.62), *P* = .0364  Mortality, *n*(%):  G1: 9 (5.63)  G2: 11 (7.05), *P* = .602 | No significant difference between extubating to HFNC or conventional oxygen therapy in escalation of care or mortality. |
| Jones et al 201644 | Randomized control trial | HFNC versus conventional oxygen therapy in the ED | G1 HFNC: 165  G2 conventional oxygen therapy: 138 | Hospital LOS, *d*:  G1: 5 (2.8-8.3)  G2: 5.6 (2.8-9.2), *P* = .43  90-day mortality, *n*(%):  G1: 35 (21.2)  G2: 24 (17.4), *P* = .40 | No significant difference between HFNC or conventional oxygen therapy in length of stay or mortality. |
| Lemiale et al 201562 | Prospective multicenter parallel-group randomized control trial | HFNC versus venturi mask for acute respiratory failure | G1 HFNC: 52  G2 Venturi mask: 48 | Escalation to MV, *n*(%):  G1: 8 (15)  G2: 4 (8), *P* = .36 | No significant difference between HFNC or venturi mask in escalation of care. |
| Lemiale et al 201760 | Post-hoc analysis of randomized control trial | Oxygen via HFNC or conventional oxygen therapy during ICU admission | G1 HFNC: 90  G2 conventional oxygen therapy: 90 | ICU LOS, *d*:  G1: 8 (5-16)  G2: 8 (3-29), *P* = .59  Hospital LOS, *d*:  G1: 24 (14-51)  G2: 32 (19-52), *P* = .25  Mortality, *n*(%):  G1: 21 (23.3)  G2: 23 (25.5), *P* = .45 | No significant difference between extubating to HFNC or conventional oxygen therapy in length of stay or mortality. |
| Makdee et al 201743 | Randomized control trial | HFNC vs conventional oxygen therapy in ED for patients with pulmonary edema | G1 HFNC: 63  G2 conventional oxygen therapy: 65 | Escalation to NIV, *n*(%):  G1: 1 (1.6)  G2: 0 (0), Difference: -1.6  (95% CI, -4.7 – 1.5)  Escalation to MV, *n*(%):  G1: 1 (1.6)  G2: 0 (0), Difference: -1.6  (95% CI, -4.7 – 1.5)  Hospital LOS, *d*:  G1: 1.1 (0.1-27.6)  G2: 11.2 (0.1-17.4), Difference: 0.1  (95% CI, -0.9 – 2.3) | No significant difference between HFNC or conventional oxygen therapy in escalation of care or length of stay. |
| Matsuda et al 202055 | Single-center, randomized controlled trial conducted in an ICU | Change in reintubation rate with HFNC versus conventional oxygen therapy | G1 Conventional oxygen therapy, 30 G2 HFNC, 39 | Reintubation rate, %  G1:15%  G2: 17%, *P* > .99  ICU LOS, d  G1: 3.8  G2: 4.4 *P* = .19 | No difference between HFNC or large-volume nebulizer in ICU LOS or in reintubation rate within 7 days. |
| Parke et al 201150 | Prospective randomized comparative study | HFNC or HFFM in mild to moderate hypoxemic respiratory failure | G1 HFNC: 29 G2 HFFM: 27 | Escalation of care, n(%):  G1: 3 (10)  G2: 8 (30), *P* = .10 | No significant difference between post-operative HFNC or HFFM in escalation of care. |
| Parke et al 201348 | Randomized control trial | HFNC vs conventional oxygen therapy after cardiac surgery | G1 HFNC: 169 G2 conventional oxygen therapy: 171 | Escalation of care, *n*(%):  G1: 47 (37.9)  G2: 77 (62.1), *P* = .001 ICU LOS, *mean hours* (SD):  G1: 33.4 (22.8)  G2: 28.9 (24.0), *P* = .08  Hospital LOS, *d*(SD):  G1: 11.6 (6.6)  G2: 11.4 (6.7), *P* = .82 | No significant difference between post-operative HFNC or conventional oxygen therapy in length of stay, though extubation to HFNC may reduce risk of reintubation. |
| Rittayamai et al 201542 | Prospective randomized comparative study | HFNC vs conventional oxygen therapy in the ED | G1 HFNC: 20  G2 conventional oxygen therapy: 20 | Rate of hospitalization, *n*(%):  G1: 10/20 (50%)  G2: 13/20 (65%), *P*=.34 | No significant difference in rate of hospitalization. |
| Song et al 201759 | Randomized control, single center trial | Extubation to either HFNC or air entrainment mask | G1 HFNC: 30 G2 Mask: 30 | Escalation to NIV, *n*(%):  G1: 2 (6.67)  G2: 3 (10), *P* = .639  Reintubation, *n*(%):  G1: 1 (3.33)  G2: 3 (10), *P* = .290 | No significant difference between post-operative HFNC or conventional oxygen therapy in escalation of care. |
| Vourc’h et al 202046 | Randomized, single-center, open-labeled, controlled trial | HFNC versus high-flow face mask (NRB) in severe hypoxemia | G1: HFNC, 47  G2: NRB, 43 | Treatment failure (NIV), n (%)  G1: 13 (28)  G2: 24 (56), *P*= .007  Reintubation, n (%)  G1: 3(6)  G2: 1(2), *P*=.75  ICU mortality, n (%)  G1: 0  G2: 0  ICU LOS, mean (SD), days  G1: 3.3 (2.4)  G2: 3.1 (1.6), *P*=.64 | The escalation to NIV in the HFNC group was significantly less than the NRB group. No difference in rates of reintubation, ICU LOS, or ICU mortality. |
| Yu et al 201747 | Prospective interventional trial | Extubation to either HFNC or conventional oxygen therapy | G1 HFNC: 56 G2 conventional oxygen therapy: 54 | Escalation to NIV, *n*(%):  G1: 5 (20)  G2: 4 (13.9), *P* = .718  Reintubation, *n*(%):  G1: 2 (8)  G2: 3 (10.34), *P* = 1  ICU LOS, *d* (SD):  G1: 3.72 + 0.56  G2: 3.64 + 0.83, *P* = .553  Hospital LOS, *d* (SD):  G1: 7.41 + 0.82  G2: 7.54 + 0.91, *P* = .433  Mortality, *n*(%):  G1: 0 (0)  G2: 0 (0) | No significant difference between post-operative HFNC or conventional oxygen therapy in escalation of care, length of stay, or mortality. |
| Zochios et al 201845 | Randomized control trial | HFNC vs conventional oxygen therapy after cardiac surgery | G1 HFNC: 49  G2: conventional oxygen therapy, 45 | Hospital LOS (days)  G1: 7  G2: 9, P = .012  ICU LOS (days)  G1: 1  G2: 1, *P* =. 949 | Use of prophylactic HFNC may reduce hospital LOS but had no effect on ICU LOS |

AHRF = Acute hypoxemic respiratory failure  
CM/NC = Cool mist/nasal cannula  
COT = Conventional oxygen therapy  
ED = Emergency department  
HFFM = High flow face mask  
HFNC = High flow nasal cannula  
LOS = Length of stay  
MV = Mechanical ventilation  
NIV = Noninvasive ventilation

Table 6: Studies of Outcomes of Active or Passive Humidification of Oxygen in Hospitalized Adult Subjects

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| --- | --- | --- | --- | --- | --- |
| Study | Study Design | Interventions | Subjects, *n* | Outcomes | Main Findings |
| Chanques et al 200964 | Randomized cross-over | HFO via face mask with HH versus BH | G1 HFO via face mask with HH: 40  G1 HFO via face mask with BH: 39 | Severity of discomfort, %:  G1 no discomfort: 33  G2 no discomfort: 24;  G1 light discomfort: 20  G2 light discomfort: 13;  G1 moderate discomfort: 26  G2 moderate discomfort: 27;  G1 severe discomfort: 22  G2 severe discomfort: 22  *P* < .01  Intensity of dryness score:  G1 3.1 (1.7-4.8)  G2 4.8 (2.0-6.4), *P* < .01 | HH improves the patient experience by reducing the level of discomfort and dryness of the nares as perceived by the patient. |
| Cuquemelle et al 201265 | Prospective randomized crossover | HFNC versus non-humidified conventional oxygen therapy | G1 HFNC: 18  G2 standard, non-humidified oxygen: 12 | Dryness score, *median* (IQR):  Nose, Hour 4  G1: 2 (0-3)  G2: 6 (2-9), *P* = .007  Nose, Hour 24  G1: 0 (0-2)  G2: 8 (0-10), *P* = .004  Patient preference, *n* (%):  G1: 16 (89)  G2: 5 (42), *P* = .01 | HFNC significantly reduced patient discomfort over non-humidified standard oxygen therapy. |
| Mauri et al 201866 | Prospective randomized crossover | HFNC at varying flows and temperatures | G1 30 LPM/31°C: 40  G2 60 LPM/31°C: 40  G3 30 LPM/37°C: 40  G4 60 LPM/37°C: 40 | Best temperature setting, *n*(%):  G1: 15 (37.5)  G2: 3 (7.5)  G3: 15 (37.5)  G4: 7 (17.5), *P* = .01  Worst temperature setting, *n*(%):  G1: 4 (10)  G2: 2 (5)  G3: 23 (57.5)  G4: 11 (27.5), *P* < .0001 | HFNC temperature may impact patient comfort. For comparable flows, lower temperatures may be better tolerated. |
| Poiroux et al 201867 | Randomized multicenter non-inferiority open trial | Standard oxygen via NC or SFM with humidification | G1 humidification: 172  G2 no humidification: 182 | Comfort score, median (IQR):  <4 LPM, Hours 6-8:  G1: 21 (10.8; 37.5)  G2: 22 (11; 38.5)  >4 LPM, Hours 6-8:  G1: 22.5 (17.8; 36.5)  G2: 25 (18.5; 45)  <4 LPM, Hour 24:  G1: 25.5 (13.5; 42.8)  G2: 21 (12; 34)  >4 LPM, Hour 24:  G1: 21 (12; 34)  G2: 21 (18.5; 43.5)  Outcomes:  Bronchoscopy, *n*(%):  G1: 7 (5.1)  G2: 8 (5.6), *P* = .85  Intubation, *n*(%):  G1: 17 (12.5)  G2: 14 (9.9), *P* = .50  NIV, *n*(%):  G1: 9 (6.6)  G2: 7 (5.0), *P* = .55  ENT infection, *n*(%):  G1:1 (0.7)  G2: 0 (0), *P* = .49  ICU LOS,days:  G1: 3 [1.0-6.0]  G2: 3 [2.0-4.5], *P* = .90  Death, *n*(%):  G1: 8 (5.9)  G2: 7 (5.0), *P* = .74 | Discomfort from low-flow, supplemental oxygen is relatively. Non-humidified oxygen was not found to be inferior to humidified oxygen. Outcomes such as mortality, escalation of care, and patient complications were not statistically different between humidified and non-humidified cohorts. |
| Vourc’h et al 202046 | Randomized, single-center, open-labeled, controlled trial | HFNC versus high-flow face mask (NRB) in severe hypoxemia | G1: HFNC, 47  G2: NRB, 43 | Satisfaction scale, median (IQR)  G1: 4.0 (3.0-4.0)  G2: 3.0 (2.0-3.0), *P*= .0002  Mucus dryness, n (%)  G1: 18 (40)  G2: 30 (71), *P* = .003  Nasal bleeding, n (%)  G1: 4 (9)  G2: 1 (2), *P* = .36 | The HFNC improved satisfaction and reduced mucus dryness compared with HFFM. |

HFO = high flow oxygen   
HFNC = high flow nasal cannula  
HH = heated humidifier  
BH = bubble humidifier  
NC = nasal cannula  
SFM = simple face mask  
LOS = length of stay  
ENT = ears, nose, and throat  
NIV = non-invasive ventilation