

Table 1. Study characteristics

Study	Setting	Population	Intervention	Control	PaO ₂ (mmHg) or PaO ₂ /FiO ₂ ratio of the participants (mean ± SD or median [IQR])
Vourc'h, 2015	Six French ICUs (3 medical, 2 medical-surgical, one surgical)	N = 119 Inclusion criteria: Adults (≥ 18 years) with acute hypoxemic respiratory failure (RR > 30 bpm and FiO ₂ ≥ 50% to obtain > 90% oxygen saturation, and estimated PaO ₂ /FiO ₂ < 300 mmHg) requiring endotracheal intubation in ICU after RSI Exclusion criteria: cardiac arrest, asphyxia, intubation without RSI, Cormack-Lehane grade 4 glottis	HFNO 4-min preoxygenation with HFNO set to 60 L/min, of humidified oxygen flow (FiO ₂ 100%); maintained in place throughout the endotracheal intubation	NRM/BVM 4-min preoxygenation with high FiO ₂ facial mask (15 L/min O ₂ flow)	PaO ₂ / FiO ₂ : Facial mask, 115.7 ± 63 HFNO, 120.2 ± 55.7
Simon, 2016	Single center in Germany	N = 40 Inclusion criteria: Respiratory failure with hypoxemia (PaO ₂ /FiO ₂ < 300 mmHg), indicated for endotracheal intubation, age ≥ 18 years Exclusion criteria: Difficult airway, nasopharyngeal obstruction or blockage	HFNO 3-min preoxygenation using HFNO, oxygen flow 50 L/min, FiO ₂ 1.0; left in place during the intubation procedure	NRM/BVM 3-min preoxygenation using a BVM (adult size AMBU SPUR II disposable resuscitator with oxygen bag reservoir and without PEEP valve or pressure manometer), O ₂ 10 L/min. No manual insufflation performed during apneic period.	PaO ₂ / FiO ₂ : BVM, 205 ± 59 HFNO, 200 ± 57
Guitton, 2019	Seven French ICU (4 medical, 2 medical-surgical, 1 surgical)	N = 184 Inclusion criteria: Adults patients (age > 18) requiring intubation in the ICU, without severe hypoxemia (PaO ₂ /FiO ₂ < 200 mmHg) Exclusion criteria: Intubation without RSI (cardiac arrest), fiberoptic intubation, asphyxia, nasopharyngeal blockade, grade 4 glottis on Cormack-Lehane scale	HFNO 4-min preoxygenation in a head-up position with HFNO (60 L/min flow of headed and humidified oxygen FiO ₂ 1.0, large or medium nasal cannulae chosen according to patients' nostril size)	NRM/BVM 4-min preoxygenation in a head-up position with BVM (disposable self-inflating resuscitator with a reservoir bag, O ₂ set at 15 L/min)	PaO ₂ / FiO ₂ : BVM, 375 [276, 446] HFNO, 318 [242, 396]

Chua, 2022	Two emergency departments in Singapore, (1 university hospital 1 general hospital)	N=192 Inclusion criteria: patients aged ≥ 21 years requiring rapid sequence intubation due to any condition. Exclusion criteria: active “do-not-resuscitate” orders; crash, awake or delayed sequence intubations; requiring non-invasive positive pressure ventilation; cardiac arrest; suspicion or confirmed diagnosis of base of skull fractures or severe facial trauma that precluded placement of NC; pregnant women; and those incarcerated	HFNO 60L/min of warm and humidified oxygen at 37°C and fraction of inspired oxygen (FiO ₂) of more than 0.90 using the AIRVO 2 Humidifier with Integrated Flow Generator (Fisher & Paykel Healthcare Ltd, Auckland, New Zealand) during preoxygenation and apnoeic oxygenation phases.	NRM/BVM usual care by preoxygenating using only NRM at flush rate, and then given at least 15L/min of non-humidified and nonheated oxygen from wall supply via NC for apnoeic oxygenation. Flush rate used for NRM preoxygenation reduces leak around the mask margins and is non-inferior to BVM, which is the other recommended modality.	Not reported
Baillard, 2006	Two medical surgical ICUs of 2 university hospitals in France	N = 53 Inclusion criteria: Acute respiratory failure requiring intubation Hypoxemia (PaO ₂ < 100 mmHg with 10 L/min O ₂ mask Exclusion criteria: encephalopathy or coma, cardiac resuscitation, hyperkalemia (> 5.5 mEq/L)	NIV 3-min preoxygenation with NIV (PSV delivered by an ICU ventilator through a face mask adjusted to obtain an expired tidal volume of 7–10 ml/kg, FiO ₂ 100%, PEEP 5 cmH ₂ O)	NRM/BVM 3-min preoxygenation with a nonbreather BVM driven by 15 L/min O ₂ Patient allowed to breathe spontaneously with occasional assistance	PaO ₂ : COT, 68 [60–79] NIV, 60 [57–89]
Baillard, 2018	Six sites in France	N = 201 Inclusion criteria: Adults patients (age > 18) with acute respiratory failure requiring intubation. Exclusion criteria: Encephalopathy or coma, cardiac resuscitation, decompensation of chronic respiratory failure	NIV 3-min preoxygenation using NIV— pressure support mode delivered by an ICU ventilator through a face mask adjusted to obtain an expired tidal volume of 6–8 ml/kg, FiO ₂ 1.0, PEEP 5 cmH ₂ O	NRM/BVM 3-min preoxygenation with non-rebreathing BVM with an oxygen reservoir driven by 15 L/min O ₂ ; patient allowed to breathe spontaneously with occasional assists	PaO ₂ /FiO ₂ : BVM, 126 [95–207] HFNO, 132 [80–175]
Frat, 2019	Twenty-eight ICUs in France	N = 313 Inclusion criteria: Patients (age > 18) admitted to the ICU requiring intubation, had acute hypoxemic respiratory failure (RR > 25 bpm or signs of respiratory distress,	HFNO 3–5-min preoxygenation at 30° with HFNO with oxygen flow 60 L/min through a heated humidifier, FiO ₂ 1.0. Clinicians performed a jaw thrust to maintain a patent upper airway, and	NIV 3–5-min preoxygenation at 30° with NIV— pressure support ventilation delivered via a face mask connected to an ICU ventilator, adjusted to obtain an expired tidal volume	PaO ₂ /FiO ₂ : HFNO, 148 ± 70 NIV, 142 ± 65

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		PaO ₂ /FiO ₂ < 300 mmHg regardless of oxygenation strategy) Exclusion criteria: Cardiac arrest, altered consciousness (GCS < 8)	continued high-flow oxygen therapy during laryngoscopy until endotracheal tube was placed into the trachea	6–8 ml/kg of predicted body weight with PEEP 5 cmH ₂ O and FiO ₂ 1.0	
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BVM: bag-valve mask; HFNO: high flow nasal oxygen; ICU: intensive care unit; NIV: noninvasive ventilation; NRM: non-rebreathing mask