XIII congresso Nazionale SIMEU

Genova, 31 maggio 2024

L'HFNC sostituirà la NIV?

Rodolfo Ferrari
UOC Pronto Soccorso e Medicina d'Urgenza
OCN Santa Maria della scaletta, Imola

NO


THANK
YOU
FOR
YOUR
ATTENTION


hp

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L'HFNC sostituirà la NIV?

Rodolfo Ferrari
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TABLE 2 Recommendations for actionable PICO questions

Clinical indication[#]	Certainty of evidence[¶]	Recommendation
Prevention of hypercapnia in COPD exacerbation	⊕⊕	Conditional recommendation against
Hypercapnia with COPD exacerbation	⊕⊕⊕⊕	Strong recommendation for
Cardiogenic pulmonary oedema	⊕⊕⊕	Strong recommendation for
Acute asthma exacerbation		No recommendation made
Immunocompromised	⊕⊕⊕	Conditional recommendation for
***De novo* respiratory failure**		No recommendation made
Post-operative patients	⊕⊕⊕	Conditional recommendation for
Palliative care	⊕⊕⊕	Conditional recommendation for
Trauma	⊕⊕⊕	Conditional recommendation for
Pandemic viral illness		No recommendation made
Post-extubation in high-risk patients (prophylaxis)	⊕⊕	Conditional recommendation for
Post-extubation respiratory failure	⊕⊕	Conditional recommendation against
Weaning in hypercapnic patients	⊕⊕⊕	Conditional recommendation for

[#]: all in the setting of acute respiratory failure; [¶]: certainty of effect estimates: ⊕⊕⊕⊕, high; ⊕⊕⊕, moderate; ⊕⊕, low; ⊕, very low.


SOLUTIONS
TAILORED
SOLUTIONS

Characteristics of high-flow nasal cannula (HFNO)

- Delivered through a comfortable nasal cannula interface. May be better tolerated than NIPPV.
- Able to provide high airflow rates (up to 60 L/min in adult).
- FiO_2 is controlled through the total flow rate of gas administrated to the device. Therefore, its directly linked to the gas source and flowmeter control.
- Higher airflow rates can provide a low level of positive end expiratory pressure (PEEP).
- The airflow is warmed and humidified to prevent dryness.
- Provides washout of dead space in the upper airways which may improve ventilation.

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saggi di critica letteraria
per "Il Gatto Selvatico" 1955-1965

Original Article

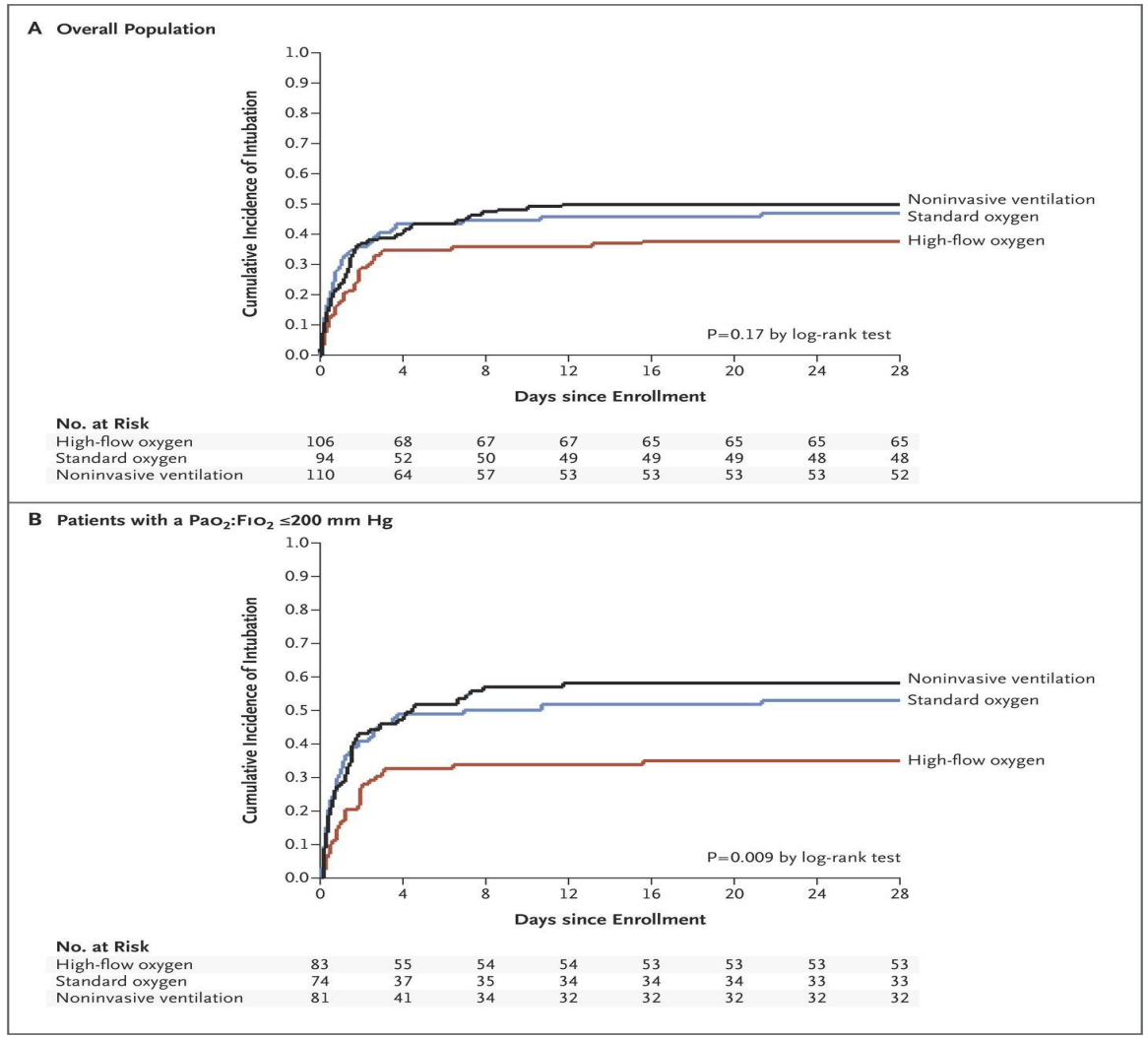
High-Flow Oxygen through Nasal Cannula in Acute Hypoxemic Respiratory Failure

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 Cottereau, M.D., Jérôme Devaquet, M.D., Saad Nseir, M.D., Ph.D., Keyvan Razazi, M.D., Jean-Paul Mira, M.D., Ph.D., Laurent Argaud, M.D., Ph.D., Jean-Charles Chakarian, M.D., Jean-Damien Ricard, M.D., Ph.D., Xavier Wittebole, M.D., Stéphanie Chevalier, M.D., Alexandre Herbland, M.D., Muriel Fartoukh, M.D., Ph.D., Jean-Michel Constantin, M.D., Ph.D., Jean-Marie Tonnelier, M.D., Marc Pierrot, M.D., Armelle Mathonnet, M.D., Gaëtan Béduneau, M.D., Céline Delétage-Métreau, Ph.D., Jean-Christophe M. Richard, M.D., Ph.D., Laurent Brochard, M.D., René Robert, M.D., Ph.D., for the FLORALI Study Group and the REVA Network

N Engl J Med
Volume 372(23):2185-2196
June 4, 2015

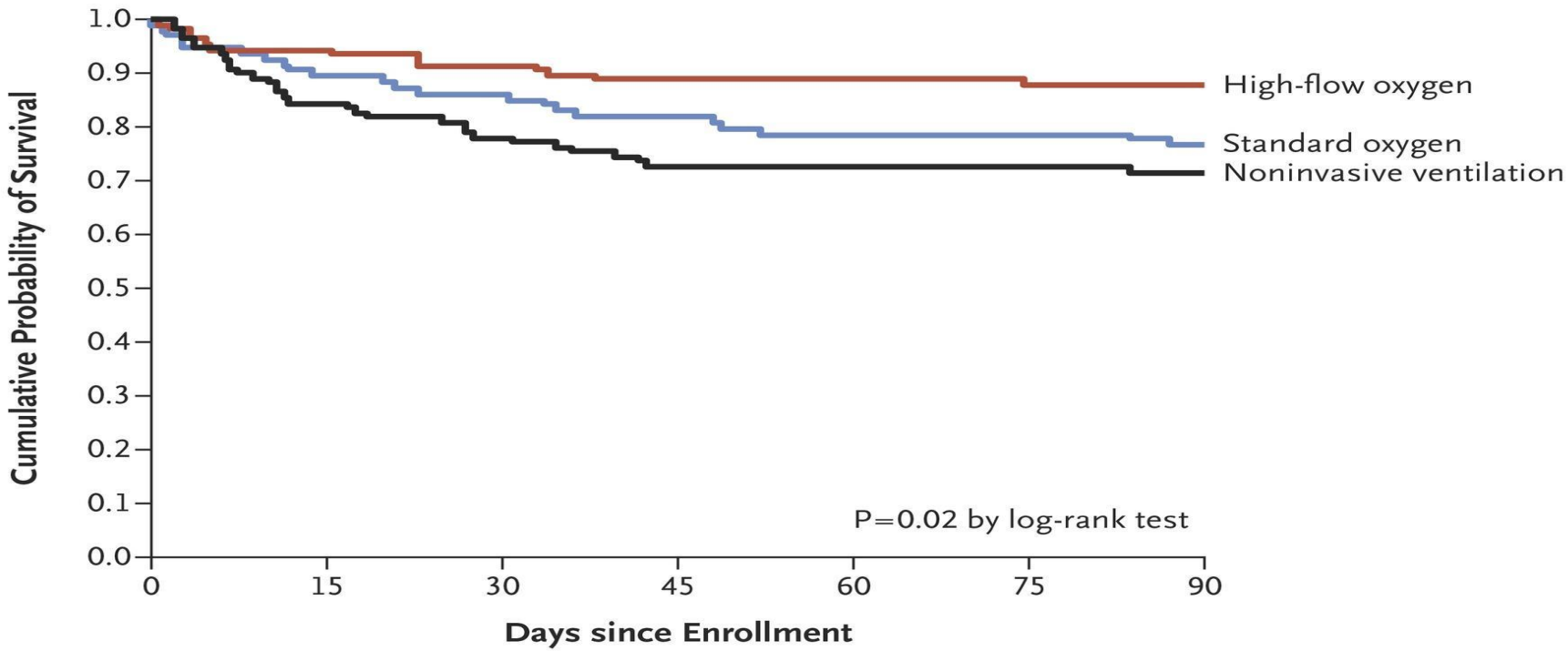
The NEW ENGLAND JOURNAL of MEDICINE

Kaplan–Meier Plots of the Cumulative Incidence of Intubation from Randomization to Day 28.



The NEW ENGLAND JOURNAL of MEDICINE

Kaplan–Meier Plot of the Probability of Survival from Randomization to Day 90.



No. at Risk							
High-flow oxygen	106	100	97	94	94	93	93
Standard oxygen	94	84	81	77	74	73	72
Noninvasive ventilation	110	93	86	80	79	78	77

The NEW ENGLAND JOURNAL of MEDICINE

- 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.

The NEW ENGLAND JOURNAL of MEDICINE


Ti piace vincere facile?

EUROPEAN RESPIRATORY JOURNAL
ERS OFFICIAL DOCUMENTS
S. OCZKOWSKI ET AL.

ERS clinical practice guidelines: high-flow nasal cannula in acute respiratory failure

Simon Oczkowski[1,2,26], Begüm Ergan[3,26], Lieuwe Bos[4,5], Michelle Chatwin[6], Miguel Ferrer[7], Cesare Gregoretti[8,9], Leo Heunks[10], Jean-Pierre Frat[11,12], Federico Longhini[13], Stefano Nava[14,15], Paolo Navalesi[16,17], Aylin Ozsancak Uğurlu[18], Lara Pisani[14,15], Teresa Renda[19], Arnaud W. Thille[11,12], João Carlos Winck[20], Wolfram Windisch[21], Thomy Tonia[22], Jeanette Boyd[23], Giovanni Sotgiu[24] and Raffaele Scala[25]

Discussion

The task force developed eight evidence-based, actionable recommendations, along with implementation considerations to assist patients, clinicians, policy-makers and other healthcare stakeholders to make rational and evidence-based decisions for using HFNC in the acute care setting. The task force identified key areas where further research is necessary to guide practice (table 3).

TABLE 2 Population, intervention, comparison, outcomes (PICO) questions and recommendations

1. Should HFNC or COT be used in patients with acute hypoxaemic respiratory failure?	The ERS task force suggests the use of HFNC over COT in patients with acute hypoxaemic respiratory failure (conditional recommendation, moderate certainty of evidence)
2. Should HFNC or NIV be used in patients with acute hypoxaemic respiratory failure?	The ERS task force suggests the use of HFNC over NIV in acute hypoxaemic respiratory failure (conditional recommendation, very low certainty of evidence)
3. Should HFNC or COT be used during breaks from NIV in patients with acute hypoxaemic respiratory failure?	The ERS task force suggests the use of HFNC over COT during breaks from NIV in patients with acute hypoxaemic respiratory failure (conditional recommendation, low certainty of evidence)
4. Should HFNC or COT be used in post-operative patients after extubation?	The ERS task force suggests the use of either COT or HFNC in post-operative patients at low risk of respiratory complications (conditional recommendation, low certainty of evidence)
5. Should HFNC or NIV be used in post-operative patients after extubation?	The ERS task force suggests the use of either HFNC or NIV in post-operative patients at high risk of respiratory complications (conditional recommendation, low certainty of evidence)
6. Should HFNC or COT be used in nonsurgical patients after extubation?	The ERS task force suggests the use of HFNC over COT in nonsurgical patients after extubation (conditional recommendation, low certainty of evidence)
7. Should HFNC or NIV be used in nonsurgical patients after extubation?	The ERS task force suggests the use of NIV over HFNC for patients at high risk of extubation failure, unless there are absolute or relative contraindications to NIV (conditional recommendation, moderate certainty of evidence)
8. Should HFNC or NIV be used in patients with acute hypercapnic respiratory failure?	The ERS task force suggests a trial of NIV prior to use of HFNC in patients with COPD and acute hypercapnic respiratory failure (conditional recommendation, low certainty of evidence)

HFNC: high-flow nasal cannula; COT: conventional oxygen therapy; NIV: noninvasive ventilation; ERS: European Respiratory Society.

recommendation
8 «suggests», 0 «recommends»
8 «weak / conditional», 0 «strong»

certainty of evidence
2 «moderate», 5 «low», 1 «very low»

PICO question 2: Should HFNC or NIV be used in patients with acute hypoxaemic respiratory failure?

Recommendation 2

We suggest the use of HFNC over NIV in patients with acute hypoxaemic respiratory failure (conditional recommendation, very low certainty of evidence).

Background

HFNC and NIV are used more frequently in patients with progressive or moderate to severe AHRF (P_{aO_2}/F_{iO_2} ≤200 mmHg), when the risks of intubation and death are higher [20, 21]. In more severe AHRF (P_{aO_2}/F_{iO_2} <100 mmHg), clinicians aim to balance the benefits of maintaining spontaneous breathing and averting intubation together with its complications (*i.e.* VAP and ventilator-induced lung injury) *versus* the harms of delayed intubation, including high inspiratory effort, increased lung stress and risk of lung injury during noninvasive respiratory support [55]. HFNC is an attractive alternative to NIV for treating patients with AHRF and high respiratory demand.

While NIV provides higher mean airway pressures than HFNC and assists ventilation by effectively unloading respiratory muscles, treatment failure is frequent. NIV failure occurs more frequently in patients with more severe ARF: P_{aO_2}/F_{iO_2} <200 mmHg before treatment and higher Simplified Acute Physiology Score II (>35) are associated with a two-fold risk of intubation [56]. Improvement in gas exchange provided by NIV may help identify patients at greatest risk of treatment failure, as P_{aO_2}/F_{iO_2} <175 mmHg after 1 h of NIV is associated with need for intubation [20]. Finally, expired tidal volume exceeding 9–9.5 $mL \cdot kg^{-1}$ predicted body weight while undergoing NIV delivered in pressure support mode with a low level of assistance can predict treatment failure with good specificity and sensitivity [57, 58].

There are practical differences between HFNC and NIV, which may impact patient comfort and tolerance. While HFNC devices use a similar interface, NIV can be delivered using either a facemask or helmet interface. To date, the most frequently used interface in RCTs has been facemask NIV, although helmet NIV may be more comfortable and allow the application of a more "protective" ventilation with higher PEEP (*i.e.* 8–12 cmH_2O) and lower pressure support values with fewer air leaks and interruptions [59, 60]. Clinicians now have the option of HFNC and NIV with a variety of interfaces for use in AHRF; however, the recent ERS/American Thoracic Society (ATS) task force did not offer a recommendation on the use of NIV for *de novo* AHRF, noting that the majority of the studies used COT as a comparator [20].

Evidence summary

We identified five parallel-group RCTs [30, 61–64] and two crossover RCTs [65, 66] comparing HFNC to NIV in AHRF. Three RCTs reported short-term mortality (hospital, ICU or 28-day), finding that HFNC may reduce mortality (risk ratio 0.77, 95% CI 0.52 to 1.14; risk difference −4.5%, 95% CI −9.4% to 2.7%; very low certainty); however, this is limited by imprecise and inconsistent effects between the studies. One trial reported a possible large reduction in mortality with use of HFNC (risk ratio 0.43, 95% CI 0.25 to 0.78; risk difference −16.1%, 95% CI −21.4% to −6.2%; low certainty). In both, the panel raised concerns that the NIV used does not reflect current real-world practice (lower intensity and duration of only 8 $h \cdot day^{-1}$), and thus the evidence is rated down for indirectness. Five RCTs evaluated effect of HFNC on intubation, demonstrating that HFNC may reduce intubation (risk ratio 0.84, 95% CI 0.61 to 1.16; risk difference −4.1%, −10.1% to 4.1%; low certainty), but this result is limited by indirectness and imprecision [30, 61–64].

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https://doi.org/10.1007/s00134-021-06506-y

GUIDELINES

Surviving sepsis campaign: international guidelines for management of sepsis and septic shock 2021

Laura Evans[1*], Andrew Rhodes[2], Waleed Alhazzani[3], Massimo Antonelli[4], Craig M. Coopersmith[5], Craig French[6], Flávia R. Machado[7], Lauralyn Mcintyre[8], Marlies Ostermann[9], Hallie C. Prescott[10], Christa Schorr[11], Steven Simpson[12], W. Joost Wiersinga[13], Fayez Alshamsi[14], Derek C. Angus[15], Yaseen Arabi[16], Luciano Azevedo[17], Richard Beale[9], Gregory Beilman[18], Emilie Belley-Cote[19], Lisa Burry[20], Maurizio Cecconi[21,22], John Centofanti[23], Angel Coz Yataco[24], Jan De Waele[25], R. Phillip Dellinger[11], Kent Doi[26], Bin Du[27], Elisa Estenssoro[28], Ricard Ferrer[29], Charles Gomersall[30], Carol Hodgson[31], Morten Hylander Møller[32], Theodore Iwashyna[33], Shevin Jacob[34], Ruth Kleinpell[35], Michael Klompas[36,37], Younsuck Koh[38], Anand Kumar[39], Arthur Kwizera[40], Suzana Lobo[41], Henry Masur[42], Steven McGloughlin[43], Sangeeta Mehta[44], Yatin Mehta[45], Mervyn Mer[46], Mark Nunnally[47], Simon Oczkowski[3], Tiffany Osborn[48], Elizabeth Papathanassoglou[49], Anders Perner[50], Michael Puskarich[51], Jason Roberts[52,53,54,55], William Schweickert[56], Maureen Seckel[57], Jonathan Sevransky[5], Charles L. Sprung[58,59], Tobias Welte[60], Janice Zimmerman[61] and Mitchell Levy[62]

VENTILATION

?		46 There is insufficient evidence to make a recommendation on the use of conservative oxygen targets in adults with sepsis-induced hypoxemic respiratory failure.
!	LOW	47 For adults with sepsis-induced hypoxemic respiratory failure, we **suggest** the use of high flow nasal oxygen over non-invasive ventilation.
?		48 There is insufficient evidence to make a recommendation on the use of non-invasive ventilation in comparison to invasive ventilation for adults with sepsis-induced hypoxemic respiratory failure.
!!	HIGH	49 For adults with sepsis-induced ARDS, we **recommend** using a low tidal volume ventilation strategy (6 mL/kg), over a high tidal volume strategy (>10 mL/kg).
!!	MODERATE	50 For adults with sepsis-induced severe ARDS, we **recommend** using an upper limit goal for plateau pressures of 30 cm H_2O, over higher plateau pressures.
!	MODERATE	51 For adults with moderate to severe sepsis-induced ARDS, we **suggest** using higher PEEP over lower PEEP.
!	LOW	52 For adults with sepsis-induced respiratory failure (without ARDS), we **suggest** using low tidal volume as compared to high tidal volume ventilation.
!	MODERATE	53 For adults with sepsis-induced moderate-severe ARDS, we **suggest** using traditional recruitment maneuvers.
!!	MODERATE	54 When using recruitment maneuvers, we **recommend against** using incremental PEEP titration/strategy.
!!	MODERATE	55 For adults with sepsis-induced moderate-severe ARDS, we **recommend** using prone ventilation for greater than 12 hours daily.
!	MODERATE	56 For adults with sepsis induced moderate-severe ARDS, we **suggest** using intermittent NMBA boluses, over NMBA continuous infusion.
!	LOW	57 For adults with sepsis-induced severe ARDS, we **suggest** using Veno-venous (VV) ECMO when conventional mechanical ventilation fails in experienced centres with the infrastructure in place to support its use.

BEST PRACTICE STATEMENT

NO RECOMMENDATION

WEAK RECOMMENDATION

STRONG RECOMMENDATION

WEAK RECOMMENDATION AGAINST

STRONG RECOMMENDATION AGAINST

HIGH QUALITY EVIDENCE

MODERATE QUALITY EVIDENCE

LOW QUALITY EVIDENCE

VERY LOW QUALITY EVIDENCE

↑ UPGRADE

↓ DOWNGRADE

NO CHANGE FROM PREVIOUS GUIDELINES

NEW / CHANGED RECOMMENDATION

High-flow nasal oxygen therapy

Recommendation
47. For adults with sepsis-induced hypoxemic respiratory failure, we **suggest** the use of high flow nasal oxygen over non-invasive ventilation *Weak recommendation, low quality of evidence*


IN UN CERTO SENSO,
NON CAPISCO MAI BÉNE
COSA SUCCEDE ...
SCHULZ

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L'HFNC sostituirà la NIV?

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NO


SCRIVERE
E` UN LAVORO
DURO
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DISEQUAZIONI IRRAZIONALI

$$x \geq \sqrt{x^2 - 4} - 4$$

DUE ESEMPI


GOODYEAR
Marlboro
1
GOODYEAR
MAGNETI
MARELLI
WEBER
GOODYEAR

Intensive Care Med
https://doi.org/10.1007/s00134-023-07033-8

GUIDELINES

ERS/ESICM/ESCMID/ALAT guidelines for the management of severe community-acquired pneumonia

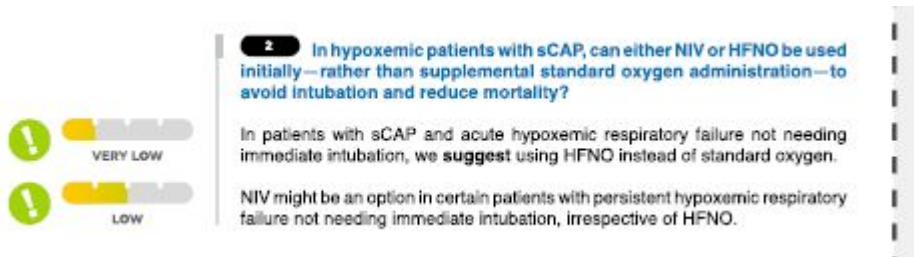
Ignacio Martin-Loeches[1,2,3,4*], Antoni Torres[3,4], Blin Nagavci[5], Stefano Aliberti[6,7], Massimo Antonelli[8], Matteo Bassetti[9], Lieuwe D. Bos[10], James D. Chalmers[11], Lennie Derde[12], Jan de Waele[13], Jose Garnacho-Montero[14], Marin Kollef[15], Carlos M. Luna[16], Rosario Menendez[17], Michael S. Niederman[17], Dmitry Ponomarev[18,19], Marcos I. Restrepo[20], David Rigau[21], Marcus J. Schultz[10,22,23], Emmanuel Weiss[24], Tobias Welte[25] and Richard Wunderink[26]

Question 2: In hypoxaemic patients with sCAP, can either non-invasive mechanical ventilation or high-flow nasal oxygen be used initially—rather than supplemental standard oxygen administration—to avoid intubation and reduce mortality?

Recommendations

In patients with sCAP and acute hypoxaemic respiratory failure not needing immediate intubation, we **suggest** using high-flow nasal oxygen (HFNO) instead of standard oxygen.
Conditional recommendation, very low quality of evidence.

Non-invasive mechanical ventilation (NIV) might be an option in certain patients with persistent hypoxaemic respiratory failure not needing immediate intubation, irrespective of HFNO.
Conditional recommendation, low quality of evidence.



The choice of NIV versus HFNO for patients with sCAP is not clear based on available evidence. However, we would recommend the use of HFNO for those patients whose issue is primarily one of worsening hypoxaemia manifested by an ongoing decrease of PaO_2/FiO_2 ratio (as recently seen in the coronavirus disease 2019 (COVID-19) pandemic) and with no increased work of breathing [51, 52]. We would suggest the use of NIV for those patients presenting with sCAP, evidence of hypoventilation or increased work of breathing (this is not in the summary of recommendations).

TABLE 2 Recommendations for actionable PICO questions

Clinical indication[#]	Certainty of evidence[¶]	Recommendation
Prevention of hypercapnia in COPD exacerbation	⊕⊕	Conditional recommendation against
Hypercapnia with COPD exacerbation	⊕⊕⊕⊕	Strong recommendation for
Cardiogenic pulmonary oedema	⊕⊕⊕	Strong recommendation for
Acute asthma exacerbation		No recommendation made
Immunocompromised	⊕⊕⊕	Conditional recommendation for
***De novo* respiratory failure**		No recommendation made
Post-operative patients	⊕⊕⊕	Conditional recommendation for
Palliative care	⊕⊕⊕	Conditional recommendation for
Trauma	⊕⊕⊕	Conditional recommendation for
Pandemic viral illness		No recommendation made
Post-extubation in high-risk patients (prophylaxis)	⊕⊕	Conditional recommendation for
Post-extubation respiratory failure	⊕⊕	Conditional recommendation against
Weaning in hypercapnic patients	⊕⊕⊕	Conditional recommendation for

[#]: all in the setting of acute respiratory failure; [¶]: certainty of effect estimates: ⊕⊕⊕⊕, high; ⊕⊕⊕, moderate; ⊕⊕, low; ⊕, very low.

NIV in ARF nell'immunocompromesso

KEY POINTS

- Survival rate in critically ill immunocompromised patients has considerably increased, mainly because of advances either in hematology and oncology or in managing organ dysfunctions in the intensive care setting.
- In hematological patients with acute respiratory failure, success of noninvasive ventilation (roughly 50%) is associated with shorter periods of mechanical ventilation and ICU stays, less infectious complications, and lower mortality rate, compared with invasive mechanical ventilation.
- Identification of predictors of noninvasive ventilation success or failure in cancer patients with acute respiratory failure may help clinicians to recognize those patients who are appropriate candidates for noninvasive ventilation and those in whom the technique is not likely to be effective, thus avoiding its application and unnecessary delays before invasive ventilation is given.
- Noninvasive ventilation may be useful to assist fiberoptic bronchoscopy with bronchoalveolar lavage in hypoxemic immunocompromised patients with inconclusive results of noninvasive investigations.
- Even though noninvasive ventilation may offer a chance for survival or to relieve dyspnea in terminally ill patients, it remains highly controversial whether the ICU may be the place for starting palliative care in these patients.

Purpose of review
Over the last few decades, the survival rate in critically ill immunocompromised patients has substantially improved, mainly because of advances in oncohematological treatments and management of organ dysfunctions in the ICU. As a result, the number of patients admitted to the ICU has rapidly grown. Immunocompromised patients in whom acute respiratory failure (ARF) develops often require mechanical ventilatory support. In these patients, noninvasive ventilation (NIV) has the potential of avoiding endotracheal intubation and its complications. This review will discuss the recent findings on the role of NIV in immunocompromised patients with ARF.

Recent findings
In recent studies, NIV success was associated with shorter periods of ventilatory assistance and ICU stays, less infectious complications, and lower ICU and hospital mortality, compared with invasive mechanical ventilation. Failure of NIV occurred in half of the hematological patients with ARF. Major risk factors for NIV failure in these patients were illness severity at baseline and the presence of acute respiratory distress syndrome on admission.

Summary
Use of NIV may not be appropriate for all immunocompromised patients. However, current evidence supports the use of NIV as the first-line approach for managing mild/moderate ARF in selected patients with immunosuppression of various origin.

Keywords
acute respiratory failure, hematological malignancy, immunosuppression, noninvasive ventilation, outcome

Table 1. Predictors of failure of noninvasive ventilation in hypoxemic patients

Predominantly immunocompetent patients	Immunocompromised patients
Higher severity score (SAPS II 35 [25]/>34 [26])	Higher illness severity at baseline reflected by SAPS II [27**]
Older age (>40 years) [25]	Higher RR under NIV [22]
Presence of ARDS or CAP [25]	Later initiation of NIV after ICU admission [22]
Failure to improve after 1 h of treatment (P_aO_2: F_iO_2 ≤146 [25]/≤175 [26])	Need for vasopressors [22]
	Need for RRT [22]
	Presence of ALI [27**]/ARDS [22,27**]

ALI, acute lung injury; ARDS, acute respiratory distress syndrome; CAP, community-acquired pneumonia; NIV, noninvasive ventilation; RR, respiratory rate; RRT, renal replacement therapy; SAPS, Simplified Acute Physiology Score.

Acute Respiratory Failure in Patients with Severe Community-acquired Pneumonia

A Prospective Randomized Evaluation of Noninvasive Ventilation

MARCO CONFALONIERI, ALFREDO POTENA, GIORGIO CARBONE, ROSSANA DELLA PORTA, ELIZABETH A. TOLLEY, and G. UMBERTO MEDURI

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Am J Respir Crit Care Med Vol 160. pp 1585–1591, 1999
Internet address: www.atsjournals.org

Guidelines for the Management of Adults with Hospital-acquired, Ventilator-associated, and Healthcare-associated Pneumonia

THIS OFFICIAL STATEMENT OF THE AMERICAN THORACIC SOCIETY AND THE INFECTIOUS DISEASES SOCIETY OF AMERICA WAS APPROVED BY THE ATS BOARD OF DIRECTORS, DECEMBER 2004 AND THE IDSA GUIDELINE COMMITTEE, OCTOBER 2004

Am J Respir Crit Care Med Vol 171. pp 388–416, 2005
DOI: 10.1164/rccm.200405-644ST
Internet address: www.atsjournals.org

more than $40,000 per patient (9–11). Although HAP is not a reportable illness, available data suggest that it occurs at a rate of between 5 and 10 cases per 1,000 hospital admissions, with the incidence increasing by as much as 6- to 20-fold in mechanically ventilated patients (9, 12, 13). It is often difficult to define the

more than 50% of the antibiotics prescribed (16). VAP occurs in 9–27% of all intubated patients (9, 11). In ICU patients, nearly 90% of episodes of HAP occur during mechanical ventilation.

VAP occur within the first 4 days of mechanical ventilation. The intubation process itself contributes to the risk of infection, and when patients with acute respiratory failure are managed with noninvasive ventilation, nosocomial pneumonia is less common (18–20).

The crude mortality rate for HAP may be as high as 30 to 70%, but many of these critically ill patients with HAP die of their underlying disease rather than pneumonia. The mortality related to the HAP or "attributable mortality" has been estimated to be between 33 and 50% in several case-matching studies of VAP. Increased mortality rates were associated with bacteremia,

Aspiration of oropharyngeal pathogens, or leakage of secretions containing bacteria around the endotracheal tube cuff, are the primary routes of bacterial entry into the lower respiratory tract (**Level II**) (95–98).

Intubation and mechanical ventilation increase the risk of HAP 6- to 21-fold and therefore should be avoided whenever possible (3, 94, 110, 114). Noninvasive positive-pressure ventilation, using a face mask, is an attractive alternative for patients with acute exacerbations of chronic obstructive pulmonary disease or acute hypoxemic respiratory failure, and for some immunosuppressed patients with pulmonary infiltrates and respiratory failure (18, 20, 115–119). Data suggest that use of noninvasive ventilation to

Noninvasive ventilation should be used whenever possible in selected patients with respiratory failure (**Level I**) (18, 20, 115–119).

VAP may also be related to colonization of the ventilator circuit (131). A large number of prospective, randomized trials have shown that the frequency of ventilator circuit change does not affect the incidence of HAP, but condensate collecting in the ventilator circuit can become contaminated from patient secretions (98, 132–135). Therefore, vigilance is needed to pre-

Infectious Diseases Society of America/American Thoracic Society Consensus Guidelines on the Management of Community-Acquired Pneumonia in Adults

Lionel A. Mandell,[1,a] Richard G. Wunderink,[2,a] Antonio Anzueto,[3,4] John G. Bartlett,[7] G. Douglas Campbell,[8] Nathan C. Dean,[9,10] Scott F. Dowell,[11] Thomas M. File, Jr.[12,13] Daniel M. Musher,[5,6] Michael S. Niederman,[14,15] Antonio Torres,[16] and Cynthia G. Whitney[11]

Clinical Infectious Diseases 2007; 44:S27–72

36. Patients with hypoxemia or respiratory distress should receive a cautious trial of noninvasive ventilation unless they require immediate intubation because of severe hypoxemia (PaO_2/FiO_2 ratio, <150) and bilateral alveolar infiltrates. (Moderate recommendation; level I evidence.)

36. Patients with hypoxemia or respiratory distress should receive a cautious trial of noninvasive ventilation (NIV) unless they require immediate intubation because of severe hypoxemia (arterial oxygen pressure/fraction of inspired oxygen [PaO_2/FiO_2] ratio, <150) and bilateral alveolar infiltrates. (Moderate recommendation; level I evidence.)

Patients who do not require immediate intubation but who have either hypoxemia or respiratory distress should receive a trial of NIV [114, 288, 289]. Patients with underlying COPD are most likely to benefit. Patients with CAP who were randomized to receive NIV had a >25% absolute risk reduction for the need for intubation [114]. The use of NIV may also improve intermediate-term mortality. Inability to expectorate may limit the use of NIV [290], but intermittent application of NIV may allow for its use in patients with productive cough unless sputum production is excessive. Prompt recognition of a failed NIV trial is critically important, because most studies demonstrate worse outcomes for patients who require intubation after a prolonged NIV trial [288, 290]. Within the first 1–2 h of NIV, failure to improve respiratory rate and oxygenation [114, 289, 290] or failure to decrease carbon dioxide partial pressure (pCO_2) in patients with initial hypercarbia [114] predicts NIV failure and warrants prompt intubation. NIV provides no benefit for patients with ARDS [289], which may be nearly indistinguishable from CAP among patients with bilateral alveolar infiltrates. Patients with CAP who have severe hypoxemia (PaO_2/FiO_2 ratio, <150) are also poor candidates for NIV [290].


THE TRIAL

BTS guideline for oxygen use in adults in healthcare and emergency settings

B R O'Driscoll,[1,2] L S Howard,[3] J Earis,[4] V Mak,[5] on behalf of the British Thoracic Society Emergency Oxygen Guideline Group

EXECUTIVE SUMMARY OF THE GUIDELINE

Philosophy of the guideline

- Oxygen is a treatment for hypoxaemia, not breathlessness. Oxygen has not been proven to have any consistent effect on the sensation of breathlessness in non-hypoxaemic patients.
- The essence of this guideline can be summarised simply as a requirement for oxygen to be prescribed according to a target saturation range and for those who administer oxygen therapy to monitor the patient and keep within the target saturation range.
- The guideline recommends aiming to achieve normal or near-normal oxygen saturation for all acutely ill patients apart from those at risk of hypercapnic respiratory failure or those receiving terminal palliative care.

1 Assessing patients

- For critically ill patients, high-concentration oxygen should be administered immediately (table 1 and figure 1 (chart 1)) and this should be recorded afterwards in the patient's health record.
- Clinicians must bear in mind that supplemental oxygen is given to improve oxygenation but is appropriate oxygen therapy can be started in the event of unexpected clinical deterioration with hypoxaemia and also to ensure that the oximetry section of the early warning score (EWS) can be scored appropriately.
- The target saturation should be written (or ringed) on the drug chart or entered in an electronic prescribing system (guidance on figure 1 (chart 1)).

3 Oxygen administration

- Oxygen should be administered by staff who are trained in oxygen administration.
- These staff should use appropriate devices and flow rates in order to achieve the target saturation range (figure 2 (chart 2)).
- Staff should be trained in the use of a range of different oxygen delivery devices to ensure oxygen is delivered safely.

4 Monitoring and maintenance of target saturation

- Oxygen saturation and delivery system (includ-

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ORIGINAL

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Helmet CPAP vs. oxygen therapy in severe hypoxemic respiratory failure due to pneumonia

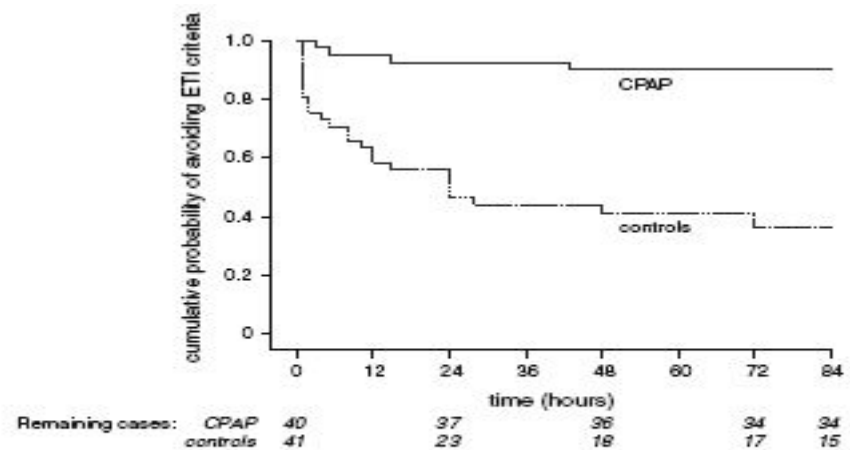

Fig. 2 Kaplan–Meier analysis of time to the primary endpoint. *CPAP* continuous positive airway pressure, *ETI* endotracheal intubation

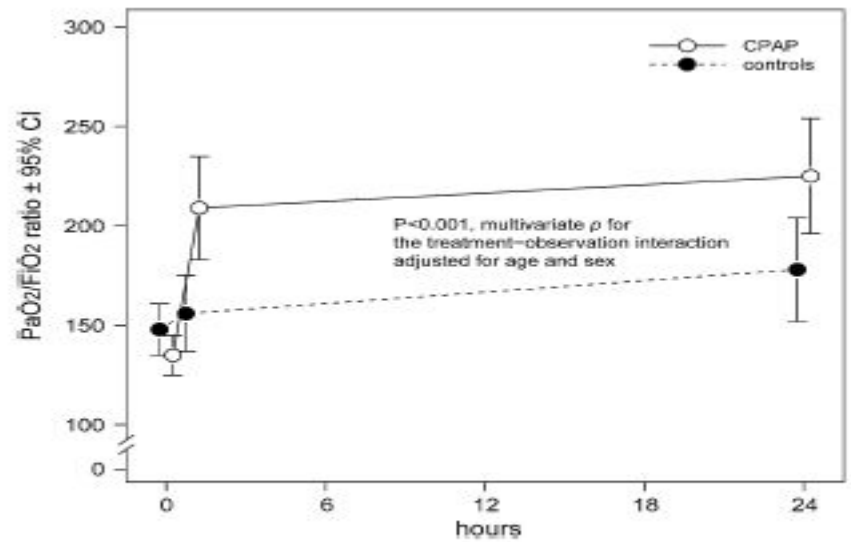

Fig. 3 Time course of PaO_2/FiO_2 ratio. *CPAP* continuous positive airway pressure

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Non-invasive positive pressure ventilation in pneumonia outside Intensive Care Unit: An Italian multicenter observational study

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Respiratory insufficiency

ABSTRACT

Background and objective: Non-Invasive Ventilation (NIV) represents a standard of care to treat some acute respiratory failure (ARF). Data on its use in pneumonia are lacking, especially in a setting outside the Intensive Care Unit (ICU). The aims of this study were to evaluate the use of NIV in ARF due to pneumonia outside the ICU, and to identify risk factors for in-hospital mortality.

Methods: Prospective, observational study performed in 19 centers in Italy. Patients with ARF due to pneumonia treated outside the ICU with either continuous positive airway pressure (CPAP) or noninvasive positive pressure ventilation (NPPV) were enrolled over a period of at least 3 consecutive months in 2013. Independent factors related to in-hospital mortality were evaluated.

Results: Among the 347 patients enrolled, CPAP was applied as first treatment in 176 (50.7%) patients,NPPV in 171 (49.3%). The NPPV compared with CPAP group showed a significant higher $PaCO_2$ (55 [47–78] vs 37 [32–43] mmHg, $p < 0.001$), a lower arterial pH (7.30 [7.21–7.37] vs 7.43 [7.35–7.47], $p < 0.001$), higher HCO3- (28 [24–33] vs 24 [21–27] mmol/L, $p < 0.001$). De-novo ARF was more prevalent in CPAP group than in NPPV group (86/176 vs 31/171 patients,$p < 0.001$). In-hospital mortality was 23% (83/347). Do Not Intubate (DNI) order and Charlson Comorbidity Index (CCI) ≥3 were independent risk factors for in-hospital mortality.

Conclusions: Outside ICU setting, CPAP was used mainly for hypoxemic non-hypercapnic ARF, NPPV for hypercapnic ARF. In-hospital mortality was mainly associated to patients' basal status (DNI status, CCI) rather than the baseline degree of ARF.

1. Introduction

Acute respiratory failure (ARF) represents a frequent complication in patients with pneumonia with rates up to 56% [1]. Although oxygen therapy is the cornerstone for ARF treatment, its efficacy might be minimized because of shunt effects due to the presence of pulmonary exudate and atelectasis.To improve oxygenation, alveolar recruitment obtained through the application of either invasive or non-invasive mechanical ventilation (NIV) might be necessary, especially in severe pneumonia [2,3].

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ETTORE SCOLA
NINO MANFREDI
BRUTTI, SPORCHI e CATTIVI


GOODYEAR
2
GOODYEAR
GOODYEAR

TABLE 2 Recommendations for actionable PICO questions

Clinical indication[#]	Certainty of evidence[¶]	Recommendation
Prevention of hypercapnia in COPD exacerbation	⊕⊕	Conditional recommendation against
Hypercapnia with COPD exacerbation	⊕⊕⊕⊕	Strong recommendation for
Cardiogenic pulmonary oedema	⊕⊕⊕	Strong recommendation for
Acute asthma exacerbation		No recommendation made
Immunocompromised	⊕⊕⊕	Conditional recommendation for
***De novo* respiratory failure**		No recommendation made
Post-operative patients	⊕⊕⊕	Conditional recommendation for
Palliative care	⊕⊕⊕	Conditional recommendation for
Trauma	⊕⊕⊕	Conditional recommendation for
Pandemic viral illness		No recommendation made
Post-extubation in high-risk patients (prophylaxis)	⊕⊕	Conditional recommendation for
Post-extubation respiratory failure	⊕⊕	Conditional recommendation against
Weaning in hypercapnic patients	⊕⊕⊕	Conditional recommendation for

[#]: all in the setting of acute respiratory failure; [¶]: certainty of effect estimates: ⊕⊕⊕⊕, high; ⊕⊕⊕, moderate; ⊕⊕, low; ⊕, very low.

Noninvasive positive pressure ventilation in critical and palliative care settings: Understanding the goals of therapy*

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Objective: Although noninvasive positive pressure ventilation (NPPV) is a widely accepted treatment for some patients with acute respiratory failure, the use of NPPV in patients who have decided to forego endotracheal intubation is controversial. Therefore, the Society of Critical Care Medicine charged this Task Force with developing an approach for considering use of NPPV for patients who choose to forego endotracheal intubation.

Data Sources and Methods: The Task Force met in person once, by conference call twice, and wrote this document during six subsequent months. We reviewed English-language literature on NPPV for acute respiratory failure.

Synthesis and Overview: The use of NPPV for patients with acute respiratory failure can be classified into three categories: 1) NPPV as life support with no preset limitations on life-sustaining treatments, 2) NPPV as life support when patients and families have decided to forego endotracheal intubation, and 3) NPPV as a palliative measure when patients and families have chosen to forego all life support, receiving comfort measures only. For each category, we reviewed the rationale and evidence for NPPV, key points to communicate to patients and families, determinants of success and failure, appropriate healthcare settings, and alternative approaches if NPPV fails to achieve the original goals.

Conclusions: This Task Force suggests an approach to use of NPPV for patients and families who choose to forego endotracheal intubation. NPPV should be applied after careful discussion of the goals of care, with explicit parameters for success and failure, by experienced personnel, and in appropriate healthcare settings. Future studies are needed to evaluate the clinical outcomes of using NPPV for patients who choose to forego endotracheal intubation and to examine the perspectives of patients, families, and clinicians on use of NPPV in these contexts. (Crit Care Med 2007; 35:932–939)

KEY WORDS: intensive care; critical care; noninvasive ventilation; palliative care; end-of-life care

Noninvasive Ventilation in Patients With Do-Not-Intubate and Comfort-Measures-Only Orders: A Systematic Review and Meta-Analysis

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Conclusions: A large proportion of patients with do-not-intubate orders who received noninvasive ventilation survived to hospital discharge and at 1 year, with limited data showing no decrease in quality of life in survivors. Provision of noninvasive ventilation in a well-equipped hospital ward may be a viable alternative to the ICU for selected patients. Crucial questions regarding quality of life in survivors, quality of death in nonsurvivors, and the impact of noninvasive ventilation in patients with comfort-measures-only orders remain largely unanswered. (*Crit Care Med* 2018; XX:00–00)


QUANDO PENSI DI AVERE TUTTE LE RISPOSTE, LA VITA TI CAMBIA TUTTE LE DOMANDE..

XIII congresso Nazionale SIMEU

Genova, 31 maggio 2024

L'HFNC sostituirà la NIV?

Rodolfo Ferrari
UOC Pronto Soccorso e Medicina d'Urgenza
OCN Santa Maria della scaletta, Imola

NO

NIV → NRS

in assenza (attesa) di (migliori) raccomandazioni
…
primum non nocere

(selezione,
fattori prognostici,
stratificazione,
potenziale evolutivo,
monitoraggio,
intensità di cura,
ritardo IT e VMI,
ritardo NIV,
emodinamica e DO_2…)

assenza di severo distress

ARF lieve – moderata

esito non misurato solo come
tasso di mortalità - intubazione