Scientific Research Publishing

Open Journal of Emergency Medicine, 2026, 14(2), 128-140
https://www.scirp.org/journal/ojem
ISSN Online: 2332-1814
ISSN Print: 2332-1806

What Is the Role of High-Flow Nasal Oxygen Therapy in Patients with Acute Respiratory Distress Syndrome in Intensive Care at the Akanda Armed Forces Training Hospital (HIAA)?

Oliveira Stephane[1*], Mayegue Anani Ulysse[1], Mouiry Bivigou Wilfried[1], Simo Claude[1], Birinda Hilda[1], Edjo Nkilly Ghislain[2], Okoue Ondo Raphael[2], Sougou Emery[1], Tchoua Romain[2], Mandji Lawson Jean Marcel[1]

[1]Department of Anaesthesia and Intensive Care, Akanda Military Training Hospital, Libreville, Gabon
[2]Department of Anaesthesia and Intensive Care, Omar Bongo Ondimba Military Training Hospital, Libreville, Gabon
Email: *oliveira.stephane1980@gmail.com, oliveira.stephane1980@gmail.com

How to cite this paper: Stephane, O., Ulysse, M.A., Wilfried, M.B., Claude, S., Hilda, B., Ghislain, E.N., Raphael, O.O., Emery, S., Romain, T. and Marcel, M.L.J. (2026) What Is the Role of High-Flow Nasal Oxygen Therapy in Patients with Acute Respiratory Distress Syndrome in Intensive Care at the Akanda Armed Forces Training Hospital (HIAA)? *Open Journal of Emergency Medicine*, **14**, 128-140.
https://doi.org/10.4236/ojem.2026.142011

Received: March 20, 2026
Accepted: June 6, 2026
Published: June 9, 2026

Abstract

Introduction: To describe the experience of the intensive care unit at the Akanda Army Training Hospital (HIAA) in the use of HDNO for the treatment of ARDS. **Patients and Methods:** This was a mixed (retrospective and prospective) study, with both descriptive and analytical objectives, conducted using a cross-sectional data collection method, carried out in the HIAA intensive care unit over a period of 29 months (April 2023 to August 2025). Clinical and laboratory data were collected from ARDS patients, both those who received invasive ventilation and those who did not. Statistical analysis of these data was performed using IBM SPSS software. **Results:** Twenty-seven patients were included, with a mean age of 47 years and an age range of 14 to 81 years. The distribution of mild, moderate and severe ARDS was 11%, 52% and 37% respectively. HDNO prevented the use of mechanical ventilation in all patients with mild ARDS, in 93% of patients with moderate ARDS, and in 30% of patients with severe ARDS. The mortality rate was 33.4%, with 80% of these deaths occurring in patients with severe ARDS. **Conclusion:** Although this study does not provide conclusive evidence of the effectiveness of HRNO in the management of ARDS, this pioneering study in sub-Saharan Africa indicates that, under certain conditions, the use of HRNO in selected cases of moderate to severe ARDS may represent a viable alternative.

Keywords

High-Flow Nasal Oxygen Therapy (HFNO), Acute Respiratory Distress Syndrome (ARDS), Mechanical Ventilation (MV), Intensive Care

1. Introduction

Acute respiratory distress syndrome (ARDS) is a common condition in intensive care and continues to be associated with high morbidity and mortality [1]-[3]. Although mechanical ventilation (MV) remains the standard treatment in the majority of algorithms for managing moderate to severe ARDS, this oxygenation technique is still associated with numerous complications, such as ventilator-associated pneumonia (VAP) and ventilator-induced lung injury (VILI) [4]-[6]. Several non-invasive ventilation (NIV) strategies have emerged in recent years, including high-flow nasal oxygen therapy (HFNO) for moderate to mild ARDS. Compared to other traditional NIV techniques, which use either a ventilator or continuous positive airway pressure, the use of HDNO is on the rise because it results in less VILI [7]. Indeed, HFNO enables the delivery of humidified oxygen at a high flow rate, up to 70 L/min, thereby minimising VILI while improving patient comfort [7]-[9]. At the intensive care unit of the Akanda Army Training Hospital (HIAA), HRNO is being increasingly incorporated into the management of ARDS in general. Driven by the desire to improve our practices in a resource-constrained environment, we conducted this study, the main objective of which was to assess the effectiveness of nHFOT in patients admitted to the HIAA with ARDS.

2. Patients and Methods

This was a mixed (retrospective and prospective) study, of a descriptive and analytical nature, conducted using a cross-sectional data collection method over a 29-month period, from April 2023 to August 2025, among patients admitted to the intensive care unit of the Akanda Army Training Hospital (HIAA) with acute respiratory distress syndrome (ARDS) or who developed ARDS during their hospital stay, regardless of their age or sex. Recruitment included all patients with ARDS who had a Glasgow Coma Scale (GCS) score of ≥10, excluding those whose respiratory distress was of cardiac or traumatic origin.

The primary endpoint was to assess the frequency of intubation in intensive care patients following the use of HDNO.

The secondary endpoints were:

1) Improvement in blood gas levels in the hours or days following initiation of the oxygenation device (increase in $PaO_2 \geq 50$ mmHg, decrease in $PaCO_2 \leq 10$ mmHg);

2) Reduction in respiratory rate (RR): a decrease of 10 to 20 points from the

initial RR.

These endpoints were monitored from the first day of hospitalisation (D0) until the end of the patient's stay.

Upon admission, each patient underwent blood gas analysis, with the ratio of partial pressure of oxygen (PaO_2) to fraction of inspired oxygen (FiO_2), expressed in millimetres of mercury (mmHg), enabling ARDS to be classified into three stages (mild $200 < PaO_2/FiO_2 \leq 300$ mmHg; moderate $100 < PaO_2/FiO_2 \leq 200$ mmHg; and severe $PaO_2/FiO_2 \leq 100$ mmHg), as well as a transthoracic echocardiogram (TTE) to rule out a cardiac aetiology.

All patients with mild to moderate ARDS received NIV using HDNO.

Patients admitted directly to intensive care with severe ARDS, or who progressed to severe ARDS while maintaining a preserved level of consciousness (GCS > 10), received the following oxygen therapy:

- Either NIV using a ventilator set with an appropriate pressure support, a PEEP between 8 and 10 mmHg, and an FiO_2 between 0.5 and 1. The duration of NIV via ventilator depended on the patient's tolerance and could be combined with HDNO;
- Or HDNO alone in the event of demonstrated intolerance to NIV via a ventilator, thereby constituting a de facto alternative, with the initial O_2 flow rate set at 60 L/min.

The decision to initiate MV could be made in the hours following Day of hospitalisation (D0) or on subsequent days, and depended on the trend in the ARDS blood gas parameters under this initial non-invasive management, on signs of neurological instability (GCS < 10), and on respiratory distress such as:

- Polypnoea: characterised by a respiratory rate greater than 30 cycles per minute (min);
- Hypoxaemia: characterised by a $PaO_2 < 60$ mmHg;
- Hypercapnia: defined as $PaCO_2 > 45$ mmHg.

The criteria for NIV failure, including HDNO, were:

- Recourse to intubation;
- Deterioration of blood gas levels;
- Deterioration of respiratory status;
- Impaired consciousness.

The data presented in the study were collected using a standardised data collection form, which included sociodemographic data, comorbidities, clinical and laboratory data, and the patient's clinical course.

The data were collected using a standardised data collection form and analysed using IBM SPSS Statistics© for Windows, version 25.0 (Armonk, NY: IBM Corp.). No multivariate analysis was performed, given the limited sample size. The statistical test used to compare all variables was the Chi-squared test.

The study protocol was approved by the HIAA Institutional Ethics Committee. Written informed consent was obtained from all patients, their next of kin, or another substitute decision-maker, as appropriate.

3. Results

During the study, 349 patients were admitted to the HIAA intensive care unit, including 42 for respiratory distress and 27 for ARDS, giving a prevalence of 7.7% (Figure 1).

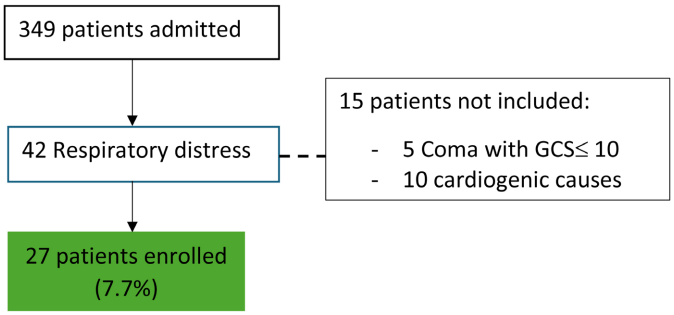

Figure 1. Flowchart.

The median age was 47 years [IQR: 25.5 - 61.5], with a range from 14 to 81 years. The male-to-female ratio was 1.16, *i.e.*, 55.5% male. The median body mass index (BMI) was 27 kg/m^2 [IQR: 20.5 - 29.5] (Table 1).

Table 1. Demographic and anthropometric characteristics of patients on admission.

Variable	Value
Age (years), median [IQR]	47 [25.5 - 61.5]
BMI (kg/m^2), median [IQR]	27 [20.5 - 29.5]
Sex	
Male	15/27 (55.5%)
Female	12/27 (44.5%)
Age group	
(0 - 15)	2/27 (7.4%)
(15 - 29)	6/27 (22.2%)
(30 - 44)	4/27 (14.8%)
(45 - 59)	6/27 (22.2%)
(60 - 74)	5/27 (18.5%)
(>75 years)	4/27 (14.8%)

Twenty-three (23) patients, representing 85.2% of the selected cohort, had one or more comorbidities, primarily hypertension and chronic respiratory conditions, accounting for 37.03% and 29.6% of cases respectively (Table 2).

In terms of respiratory status, 51.8% (n = 14/27) of the patients had moderate ARDS and 37.03% (n = 10/27) had severe ARDS (Figure 2).

The median SOFA score calculated upon admission to the intensive care unit was 4 [IQR: 3 - 7], and the median IGS II score was 50 [IQR: 40.5 - 59.5].

Among the aetiologies of ARDS, severe community-acquired acute pneumonia was found in 51.8% of cases, followed by Pneumocystis pneumonia and aspiration pneumonia in 14.81% and 14.81% of cases, respectively (Figure 3).

Table 2. List of comorbidities observed in ARDS patients.

Variable	Value (n, %)
Smoking	2/27 (7.4%)
Chronic respiratory diseases (Asthma/COPD/Pulmonary fibrosis)	8/27 (29.6%)
Pulmonary tuberculosis	2/27 (7.4%)
High blood pressure	10/27 (37.03%)
HIV-positive	5/27 (18.5%)
Diabetes	5/27 (18.5%)
Previous surgery	4/27 (14.8%)
Sickle cell disease	2/27 (7.4%)

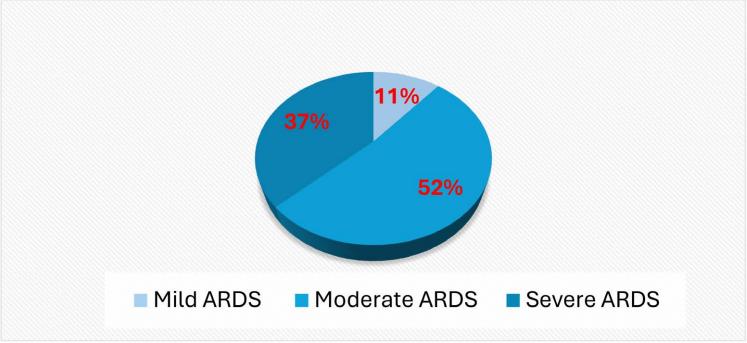

Figure 2. Distribution of patients according to ARDS severity on admission.

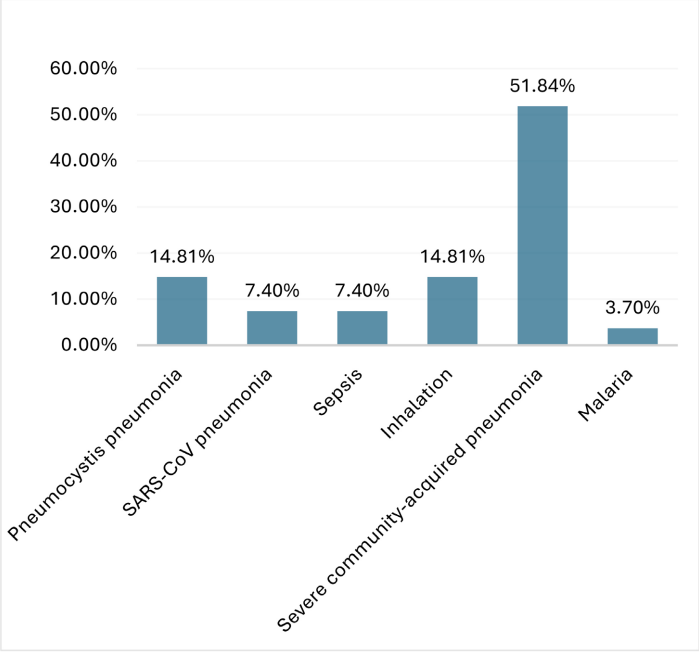

Figure 3. Distribution of ARDS cases by aetiology.

Figure 4 shows the mean change in the PaO_2/FiO_2 ratio in the cohort of patients classified as having mild or moderate ARDS who received HDNO as the sole means of oxygenation, from the first day of admission (D0) to D3 and then to D5 of hospitalisation. There was complete resolution of ARDS in all patients with mild ARDS (n = 3), as well as resolution in almost all patients with moderate ARDS (n = 13/14). Only one patient with moderate ARDS had progressed to a case of severe ARDS.

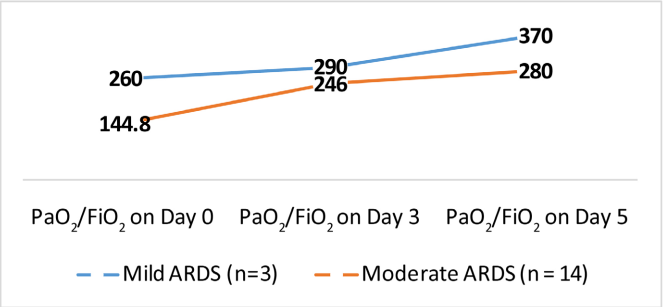

Figure 4. Mean change in PaO_2/FiO_2 ratio in patients with mild or moderate ARDS receiving HDO alone.

In the groups of patients admitted with severe ARDS, a mean regression of ARDS was observed over time on Day 3 and then on Day 5 in the group of patients receiving oxygen therapy with HDO alone (Figure 5). Of the three patients receiving HDNO alone, only one was placed on mechanical ventilation on Day 5 of hospitalisation and subsequently died. The remaining patients with severe ARDS (n = 7) who received NIV, either on its own or in combination with HDNO, all eventually required MV and died (Figure 5).

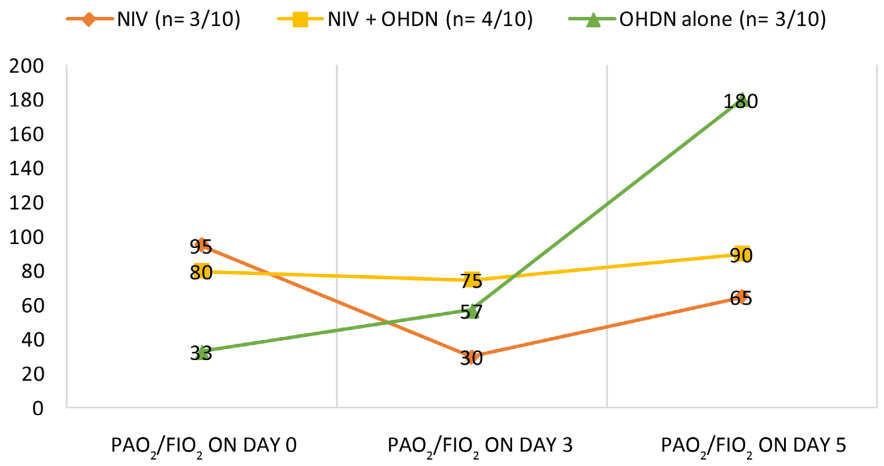

Figure 5. Mean change in PaO_2/FiO_2 ratio according to the type of non-invasive device.

Overall, of the 27 patients admitted to intensive care with ARDS, the clinical course was favourable for 18 (*i.e.*, 66.6%). The characteristics observed in their management and clinical course were as follows:

- A favourable outcome for all 3 patients with mild ARDS who were placed on HPNA;
- An unfavourable outcome for one (01) of the 14 patients initially treated for moderate ARDS, who were initially placed on HDN alone and whose condition progressed to severe ARDS before they were intubated and subsequently died;
- Of the ten (10) patients with severe ARDS who received NIV using either HDN alone, HDN combined with NIV, or NIV using a ventilator, only two patients in the group treated with HDN alone survived and did not require intubation.

The mortality rate was 33.4%.

No associated factors influencing the course of ARDS were identified in our study.

4. Discussion

This study is the first in the Central African subregion to assess the effectiveness of using HDNO in ARDS patients in intensive care. In this prospective, cross-sectional, descriptive and analytical study, the outcome is determined by the reduction in the use of intubation (primary endpoint) in patients with ARDS. The main limitation was that the small sample size (27) did not allow for the reliable fitting of a multivariate model without the risk of overfitting. Therefore, the results presented describe unadjusted associations between clinical factors and the initial severity of ARDS.

In our study, the hospital prevalence was 7.7%, which is in line with the hospital prevalence of 8.5% reported by Bouzian's team in Fez [6]. Among the patients included in the study, the median age was 47 years [IQR: 25.5 - 61.5]. These results are similar to those reported by J. P. Frat *et al.*, who found a median age of 61 years. Males were the most represented gender, accounting for 55.6%; in contrast, the cohort studied by J. P. Frat *et al.* [9] found a female predominance.

In our cohort, 85.18% of patients had a significant burden of pre-existing comorbidities. A cardiovascular (hypertension) history was present in 37% of patients; these proportions are also observed in the studies by G. Bellani [10] and M. Bouzian [6]. Hypertension was predominant, affecting 56.6% of the cohort, *i.e.* more than half. This result is similar to those found in several Western meta-analyses, as well as by the team led by Donamou *et al.* [11] [12], who reported 55% of COVID patients admitted to intensive care having hypertension. In contrast, in Lombardy (Italy), hypertension affected 49% of patients in COVID-19 intensive care units, and 48% in the intensive care unit of Pitié-Salpêtrière Hospital in France. Pitié-Salpêtrière Hospital [13]. Developing countries are more likely to be affected by hypertension [14]. In Gabon, a study conducted by J. B. MIPINDA *et al.* [15] showed that nearly a quarter of the Gabonese population was hypertensive, which therefore explains the prevalence of this condition in this cohort.

The severity scores obtained in the study, such as an IGS II score of 50 and a

SOFA score of 4, yielded a predicted mortality of less than 10%, which was similar to those reported by Ranieri *et al.* [3] [2] or Bouzian *et al.* [6].

The aetiologies of ARDS are attributable to pulmonary pathology (50% to 75%), such as bacterial or viral pneumonia, or to extrapulmonary causes (20% to 40%), such as sepsis [2] [16]. Our data are consistent with those reported in the literature, with pneumonia identified as the main cause in 88.8% of cases, in contrast to the study conducted by M. Bouzian in Fez in 2016, which found sepsis and septic shock to be the main aetiologies in36.3% of cases [6]. This difference reflects the absence of sepsis on admission in the majority of our patients, who had a mean SOFA score of 4. Moderate or severe ARDS in a septic patient poses a major therapeutic challenge for any intensive care practitioner. Although MV via tracheal intubation is often necessary to ensure adequate oxygenation, it carries significant risks, particularly in the presence of comorbidities. In our context, in Gabon, MV is delayed due to the difficulty of obtaining ventilators, but more importantly, due to the increased risk of developing VAP with multidrug-resistant organisms such as MDR-B and MRSA [17]. These reasons led us to favour non-invasive ventilation (NIV) techniques [18]. Unlike HDNV, which is recommended for moderate ARDS, NIV can lead to excessively high tidal volumes, potentially reaching 9 ml/kg, due to poorly adjusted PEEP or inspiratory support, resulting in volutrauma and therefore PSILI- or VILI-induced lung injury, which may exacerbate ARDS [19]-[21]. The majority of randomised studies have not demonstrated the superiority of NIV over HDN [9] [22]. For these reasons, we placed all patients who presented with moderate ARDS on admission on HDNO. Of the fourteen patients (14/27 = 52%) admitted with moderate ARDS and managed with HDNF, the outcome was unfavourable for one patient, who required mechanical ventilation and died. The study by Sztrymf B *et al.* showed that HDNF could reduce the need for MV [23], while the study by Frat *et al.* in 2015 demonstrated that HDNF improves oxygenation and reduces the need for intubation [9] [24] [25]. Therefore, HDNF appears to be a promising alternative to NIV, capable of preventing intubation while providing effective respiratory support. This alternative, which enables the maintenance of adequate oxygenation without the need for intubation, is crucial for patients with moderate to severe ARDS, where the risk of developing complications related to barotrauma from MV and PAVM is high [17]-[21]. In the majority of cases, the decision to use HDNO was made on the basis of strict clinical criteria: preserved consciousness, no signs of respiratory failure, haemodynamic stability, and no acute organ failure. In our study, the outcome was unfavourable for all patients with severe ARDS who were managed with NIV via a ventilator or placed on MV, in contrast to those oxygenated via HDN, where two out of three patients survived. Although the overall mortality rate observed in our study was 33.4%, this rate was 80% for cases of severe ARDS, where all patients in the group receiving MV or NIV died, compared with those receiving HDNO alone. A reduction in the ICU mortality rate in the group of ARDS patients receiving HDNO versus NIV was also observed in the FLORALI study [22]. Although the mortality rate observed

in this study is similar to some rates reported in the majority of sub-Saharan African countries, it remains lower than those reported by the team led by M. Bouzian *et al.*, who found an overall mortality rate of 40%, including 62.5% for cases of severe ARDS [2] [6].

5. Conclusions

High-flow nasal oxygen therapy (HFNO), used as the primary mode of oxygenation in cases of mild to moderate ARDS, resulted in a favourable outcome for the majority of patients. Notably, in patients with severe ARDS, the outcome under NHFO was superior to that observed under mechanical ventilation (MV) or conventional NIV.

However, these results, derived from a single-centre observational study involving a small sample size and without treatment randomisation, do not allow us to conclusively affirm the superiority of NHFO. Nevertheless, in the specific context of Gabon (a resource-constrained country), where the risk of ventilator-associated pneumonia (VAP) is a critical factor contributing to excess mortality, HHFO appears to be a promising and relevant therapeutic alternative for the management of ARDS.

Conflicts of Interest

There is no conflict of interest.

References

[1] Diamond, M., Peniston, H.L., Sanghavi, D.K., *et al.* (2024) Acute Respiratory Distress Syndrome. StatPearls Publishing. https://www.ncbi.nlm.nih.gov/books/NBK436002/

[2] Camarda, V. and Miller, R.F. (2025) Epidemiology, Management and Outcome of Acute Respiratory Distress Syndrome in Sub-Saharan Africa: A Systematic Review. *JRSM Open*, **16**.

[3] Ranieri, V.M., Rubenfeld, G.D., Thompson, B.T., *et al.* (2012) Acute Respiratory Distress Syndrome: The Berlin Definition. *JAMA*, **307**, 2526-2533.

[4] Merola, R., Vargas, M. and Battaglini, D. (2025) Ventilator-Induced Lung Injury: The Unseen Challenge in Acute Respiratory Distress Syndrome Management. *Journal of Clinical Medicine*, **14**, Article 3910. https://doi.org/10.3390/jcm14113910

[5] Lessert, M. (2021) Ventilator-Associated Pneumonia in Patients Mechanically Ventilated for SARS-CoV-2 Pneumonia: A Retrospective Observational Study. Master's Thesis, University of Alberta.

[6] Bouzian, M. (2016) Acute Respiratory Distress Syndrome in the Anaesthesia and Intensive Care Unit. Ph.D. Thesis, Sidi Mohammed Ben Abdellah University.

[7] Curley, G.F., Laffy, J.G., Zhang, H., *et al.* (2015) Noninvasive Respiratory Support for Acute Respiratory Failure-High-Flow Nasal Cannula Oxygen or Non-Invasive Ventilation? *Journal of Thoracic Disease*, **7**, 1092-1104.

[8] Renda, T., Corrado, A., Iskandar, G., Pelaia, G., Abdalla, K. and Navalesi, P. (2018) High-Flow Nasal Oxygen Therapy in Intensive Care and Anaesthesia. *British Journal of Anaesthesia*, **120**, 18-27. https://doi.org/10.1016/j.bja.2017.11.010

[9] Frat, J.P., Brugiere, B., Ragot, S., Chatellier, D., Veinstein, A., Goudet, V., *et al.* (2015)

Sequential Application of Oxygen Therapy via High-Flow Nasal Cannula and Non-invasive Ventilation in Acute Respiratory Failure: An Observational Pilot Study. *Respiratory Care*, **60**, 170-178. https://doi.org/10.4187/respcare.03075

[10] Bellani, G., Laffey, J.G., Pham, T., Fan, E., Brochard, L., Esteban, A., *et al.* (2016) Epidemiology, Patterns of Care, and Mortality for Patients with Acute Respiratory Distress Syndrome in Intensive Care Units in 50 Countries. *JAMA*, **315**, 788-800. https://doi.org/10.1001/jama.2016.0291

[11] Lin, X., Liu, Y., Kong, L., Jin, B., Genna, B., Zhang, S., *et al.* (2025) Comorbidity-related Risk Factors for Acute Respiratory Distress Syndrome in Sepsis Patients: A Systematic Review and Meta-Analysis. *Advances in Clinical and Experimental Medicine*, **34**, 1255-1265. https://doi.org/10.17219/acem/191594

[12] Donamou, J., Bangoura, A., Camara, L.M., Camara, D., Traoré, D.A., Abékan, R.J., *et al.* (2021) Epidemiological and Clinical Characteristics of COVID-19 Patients Admitted to the Intensive Care Unit at Donka Hospital in Conakry, Guinea: A Descriptive Study of the First 140 Hospitalised Cases. *Anesthésie & Réanimation*, **7**, 102-109. https://doi.org/10.1016/j.anrea.2021.01.001

[13] Carpentier, T., Delemer, F., Gossart, A., Dupont, H., Slama, M., Maizel, J., *et al.* (2020) COVID-19: Patient Profile Predisposing to Early Admission to the Intensive Care Unit. *Médecine et Maladies Infectieuses*, **50**, S82. https://doi.org/10.1016/j.medmal.2020.06.164

[14] Tougouma, S.J., Hien, H., Aweh, A.B., Yaméogo, A.A., Méda, C., Kambiré, Y., *et al.* (2018) Prevalence and Awareness of Hypertension among Elderly People: A Cross-Sectional Study Conducted in Bobo-Dioulasso, Burkina Faso. *Pan African Medical Journal*, **30**, Article 243. https://doi.org/10.11604/pamj.2018.30.243.15997

[15] Mipinda, J.B., Makandja, R., Ecke, E., *et al.* (2013) Prevalence of Hypertension in Outpatient Consultations at the Cardiology Department of the University Hospital Centre of Libreville (Gabon). *Tropical Cardiology*.

[16] Parrot, A., Djibré, M., Mayaud, C., *et al.* (2010) Unusual Causes of Acute Respiratory Distress Syndrome. *Réanimation*, **19**, 15-22. https://www.srlf.org/wp-content/uploads/2015/11/1002-Reanimation-Vol19-N1-p015_022.pdf

[17] Stéphane, O., Ghislain, E.N., Raphael, O.O., Fernande, M., Wilfried, M.B., Princesse, M.D., *et al.* (2025) Epidemiological Aspects of Nosocomial Infections in the Intensive Care Unit of the Akanda Army Training Hospital in Gabon from 2019 to 2022. *Advances in Microbiology*, **15**, 523-542. https://doi.org/10.4236/aim.2025.159034

[18] Howroyd, F., Chacko, C., MacDuff, A., Gautam, N., Pouchet, B., Tunnicliffe, B., *et al.* (2024) Ventilator-Associated Pneumonia: Pathobiological Heterogeneity and Diagnostic Challenges. *Nature Communications*, **15**, Article No. 6447. https://doi.org/10.1038/s41467-024-50805-z

[19] Jabaudon, M., Blondonnet, R., Godet, T., *et al.* (2017) Updates on ARDS. In: *SFAR Congress-Current Update Conference*, SFAR. https://sfar.org/wp-content/uploads/2017/10/Jabaudon-Actualites-dans-le-SDRA.pdf

[20] Umbrello, M., Marino, A. and Chiumello, D. (2017) Tidal Volume in Acute Respiratory Distress Syndrome: How Best to Select It. *Annals of Translational Medicine*, **5**, 287-287. https://doi.org/10.21037/atm.2017.06.51

[21] Li, L., Yang, D., Yang, M., Zhang, H., Li, L., Lu, X., *et al.* (2026) Ventilator-Induced Lung Injury: From Mechanisms to Integrated Clinical Management. *Frontiers in Medicine*, **13**, Article ID: 1789457. https://doi.org/10.3389/fmed.2026.1789457

[22] Frat, J.P., Thille, A.W., Mercat, A., Girault, C., Ragot, S., Perbet, S., *et al.* (2015) High-Flow Oxygen through Nasal Cannula in Acute Hypoxemic Respiratory Failure. *New England Journal of Medicine*, **372**, 2185-2196. https://doi.org/10.1056/nejmoa1503326

[23] Sztrymf, B., Messika, J., Bertrand, F., Hurel, D., Leon, R., Dreyfuss, D., *et al.* (2011) Beneficial Effects of Humidified High Flow Nasal Oxygen in Critical Care Patients: A Prospective Pilot Study. *Intensive Care Medicine*, **37**, 1780-1786. https://doi.org/10.1007/s00134-011-2354-6

[24] Frat, J.P., Quenot, J.P., Badie, J., Coudroy, R., Guitton, C., Ehrmann, S., *et al.* (2022) Effect of High-Flow Nasal Cannula Oxygen vs Standard Oxygen Therapy on Mortality in Patients with Respiratory Failure Due to COVID-19. *JAMA*, **328**, 1212-1222. https://doi.org/10.1001/jama.2022.15613

[25] Frat, J., Coudroy, R., Quenot, J., Guitton, C., Badie, J., Gacouin, A., *et al.* (2024) Effect of High-Flow Nasal Cannula Oxygen versus Standard Oxygen on Mortality in Patients with Acute Hypoxaemic Respiratory Failure: Protocol for a Multicentre, Randomised Controlled Trial (SOHO). *BMJ Open*, **14**, e083232. https://doi.org/10.1136/bmjopen-2023-083232

Appendix

Patient information letter

Dear Patient,

As part of our commitment to continuously improving the quality of our care, we would like to invite you to participate in a study on the management of ARDS. If you agree to participate in our study, a member of the intensive care team will visit your hospital bed once a day throughout your stay in intensive care to collect information on your comfort and your level of satisfaction.

Your participation is entirely voluntary, and you may decide at any time not to participate or to withdraw from the study, without this affecting your medical care. Of course, any data you agree to provide us with will be anonymised, and no personal information will be disclosed, in accordance with medical confidentiality.

The responses to this questionnaire will be used to conduct a study for the purposes of a scientific publication.

Thank you in advance for your help.

Yours sincerely,

Dr Mayegue Anani Ulysse

Ministry of National Defence

DIRECTORATE-GENERAL
OF THE MILITARY HEALTH SERVICE

AKANDA ARMED FORCES TRAINING HOSPITAL
AKANDA

ARMED FORCES TRAINING HOSPITAL
OMAR BONGO ONDIMBA

REPUBLIC OF GABON
Unity - Labour - Justice

☎: 01459004✉: 9455
Hiaakanda@Gmail.com

Hiaa Local Ethics Committee

Title and description of the study: Use of high-flow nasal oxygen therapy (HFNO) in patients with ARDS in intensive care: the experience of the HIAA intensive care unit.

Prospective, cross-sectional, descriptive and analytical study conducted in the intensive care unit of the HIAA in Akanda, from April 2023 to August 2025, among patients admitted to intensive care for ARDS or developing ARDS during

hospitalisation. The aim of this study is to assess the contribution of HRNO in the management of patients with ARDS.

Subject to the approval of the Head of the Anaesthesia and Intensive Care Department and the facility's Ethics Committee, patient anonymity must be respected, and an informed consent form must be provided to patients and/or their families for the purposes of data use until the final research report is drawn up.

To avoid any influence on the choice of oxygenation therapies, members of the HIAA Local Ethics Committee who work in the intensive care unit must be kept out of the assessment processes and/or other decisions regarding the treatment protocols offered to ARDS patients throughout the defined study period.

Decision of the Ethics Committee members: Favourable

Members representing the Ethics Committee: Professor MANDJI LAWSON (anaesthetist-intensivist), Professor MAYI TSONGA (gynaecology-obstetrics), Associate Lecturer MIMBILA Mylène Monia, née MAYI TSONGA (paediatrician), Dr OLIVEIRA Stéphane (anaesthetist-intensivist),

Signatures des membres du comité éthique :

Professeur MANDJI LAWSON Jean Marcel,

Chef de département en anesthésiste-réanimation

Pr. MANDJI LAWSON
Chef de Département
d'Anesthésiste - Réanimation - Urgences
HOPITAL D'INSTRUCTION DES ARMEES D'AKANDA

Professeur MAYI TSONGA Sosthène,

Chef de département en gynécologie-obstétrique

Professeur MAYI - TSONGA Sosthène
Gynécologue - Obstétricien - Sénologue
Coeliochirurgie - Maladies des Seins
Chir. Reconstructrice et Oncoplastique
Mammaires - CNOMG 0129

Maître de Conférence Agrégé MIMBILA Mylène Monia épouse MAYI TSONGA, Chef de département pédiatrie

SERVICE DE SANTE MILITAIRE
REPUBLIQUE GABONAISE
LE MEDECIN CHEF COMMANDANT L'HOPITAL
UNION - TRAVAIL - JUSTICE
H.I.A.A

Docteur OLIVEIRA Stéphane, chef de service Anesthésie-réanimation

HOPITAL D'INSTRUCTION DES ARMÉES D'AKANDA
SERVICE ANESTHESIE REANIMATION
CHE. DE SERVICE

Fait à Libreville, le 01/04/2023