# CBL COVID-19 related ARDS

**Boussarsar M**
Réanimation médicale, Sousse

# **Vignette 1**, Clinique / **Radiolgie**

**Madame MM, 42 ans, déficit immunitaire commun variable, est adressée du service de maladies infectieuses à J 7 d'évolution sous traitement associant oxygénothérapie, dexamethasone (6mg/jr), anticoagulation préventive et antibiothérapie (céforaxime, ofloxacine) d'une COVID-19 sévère compliquée d'une IRA modérée à sévère non améliorée par une VNI.**

# **Q1**, COVID-19 multivariate analysis

| Item | OR | CI95% | p |
|---|---|---|---|
| Age | 1.13 | [1.05-1.21] | 0.001 |
| Second hand patient | 5.67 | [1.18-27.17] | 0.03 |
| Plateau pressure day 5 | 1.89 | [1.4-2.55] | <0.001 |
| VAP | 39.77 | [5.25-301.47] | <0.001 |

# **Q2**, COVID-19 Ventilatory management

# Objectifs traitement
## IRA/SDRA COVID-19

1. **Amélioration des échanges gazeux**

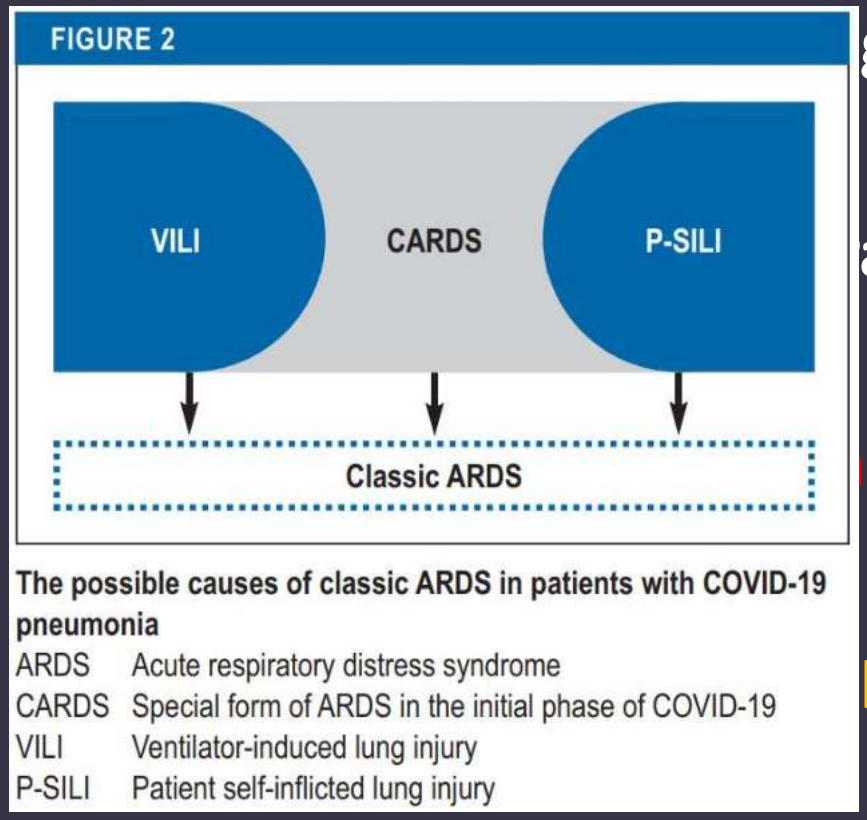
2. **Diminution du travail respiratoire**

3. **Réduction des P-SILI** (Lésions pulmonaires auto-induites)

4. **Réduction des VILI** (Lésions pulmonaires induites par le ventilateur)

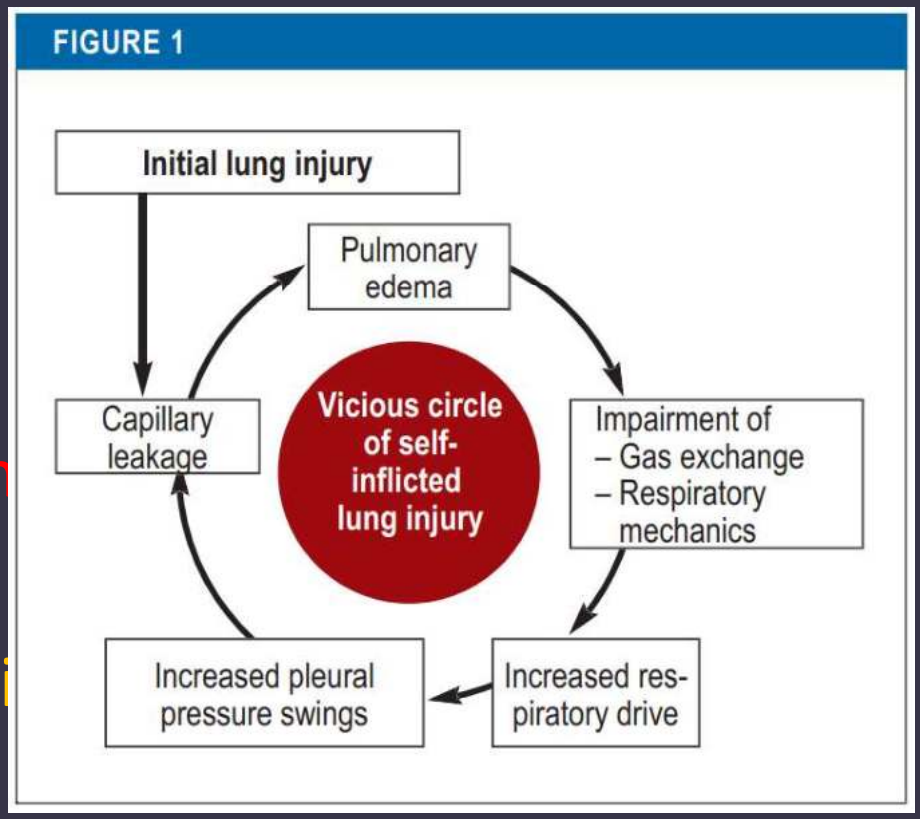
# Objectifs traitement
# IRA/SDRA COVID-19

1. gazeux
2. atoire
3. s pulmon
4. pulmonai




**The possible causes of classic ARDS in patients with COVID-19 pneumonia**

| | |
|---|---|
| ARDS | Acute respiratory distress syndrome |
| CARDS | Special form of ARDS in the initial phase of COVID-19 |
| VILI | Ventilator-induced lung injury |
| P-SILI | Patient self-inflicted lung injury |



# **Canule nasale à haut débit HFNC**
# (High Flow Nasal Cannula)

**Flow, 30-50 l/mn**
**Warm temperature**
**Water**
**Larger cannula 6-8mm**

**HFNO**
**Optiflow**
**HFNC**
**HHFNC**
**HHHFNC**

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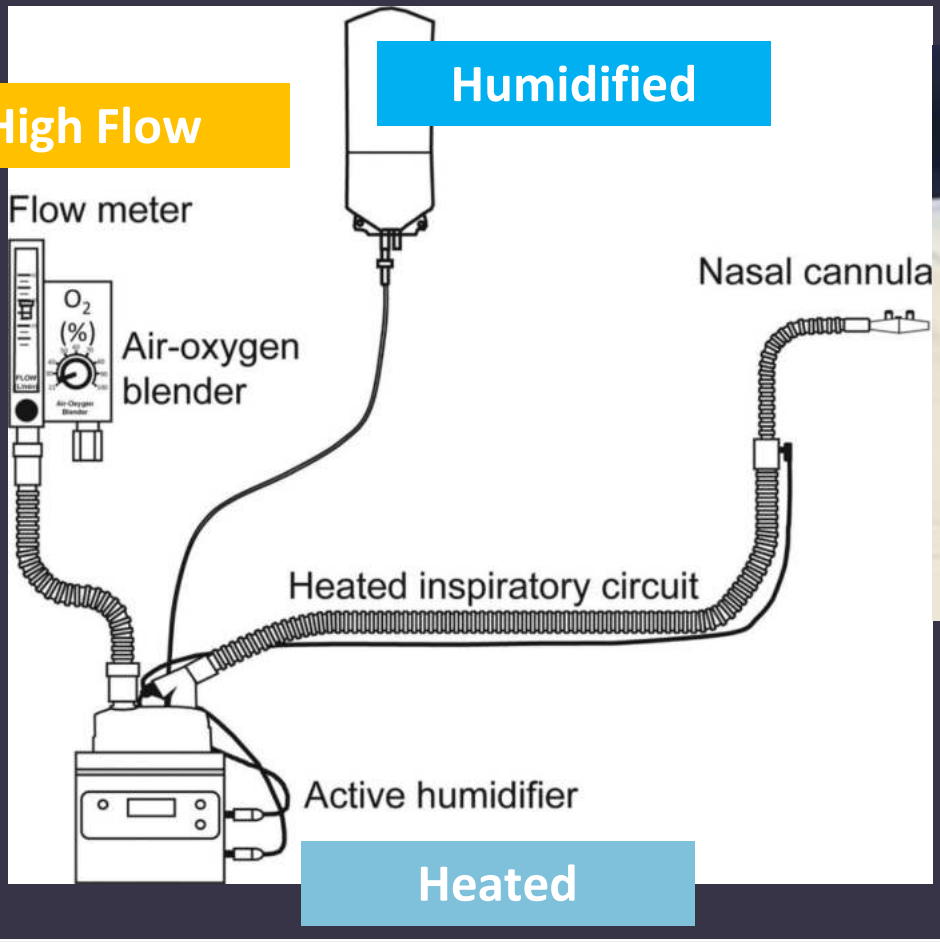


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**Optiflow**
**HFNC**
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**HHHFNC**

# CPAP (Continuous Positive Airway Pressure)

Guan *et al. Critical Care* (2020) 24:333
https://doi.org/10.1186/s13054-020-03054-7

Critical Care

LETTER Open Access

## Non-invasive ventilation in the treatment of early hypoxemic respiratory failure caused by COVID-19: considering nasal CPAP as the first choice

Lili Guan[1†], Luqian Zhou[1†], Jehane Michael Le Grange[2†], Zegu

In conclusion, there remains paucity evidence on how to choose between HFNO and nCPAP treating mild AHRF due to COVID-19. Theoretically, nCPAP has more advantages. Prospective randomized controlled trials are necessary to compare HFNO with nCPAP to provide more evidence on the indications for different non-invasive respiratory support and also indications for selecting between NIV and intubation.

# **VNI** (Ventilation

TASK FORCE REPORT
ERS/ATS GUIDELINES

## Official ERS/ATS clinical practice guidelines: noninvasive ventilation for acute respiratory failure

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.

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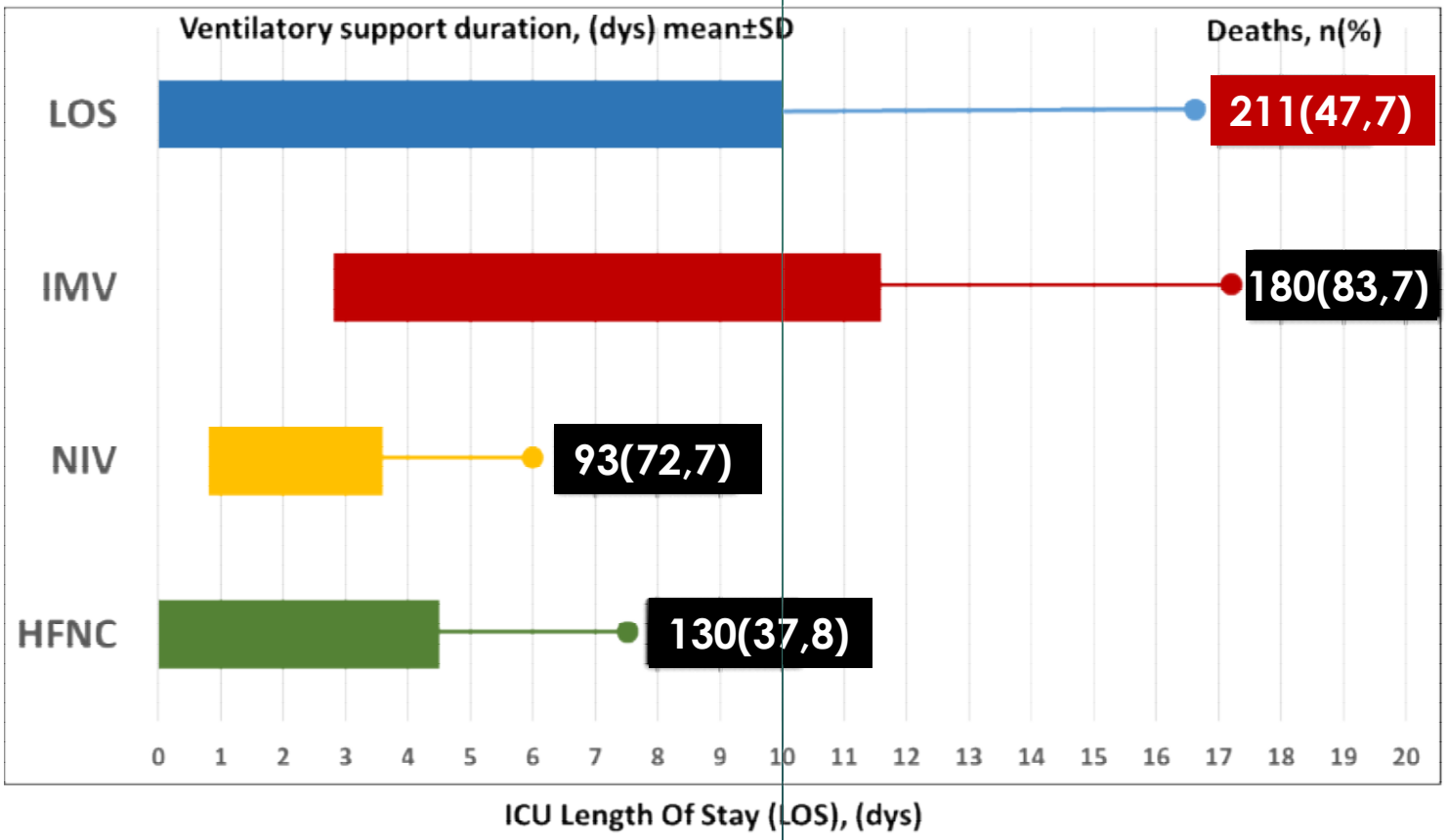
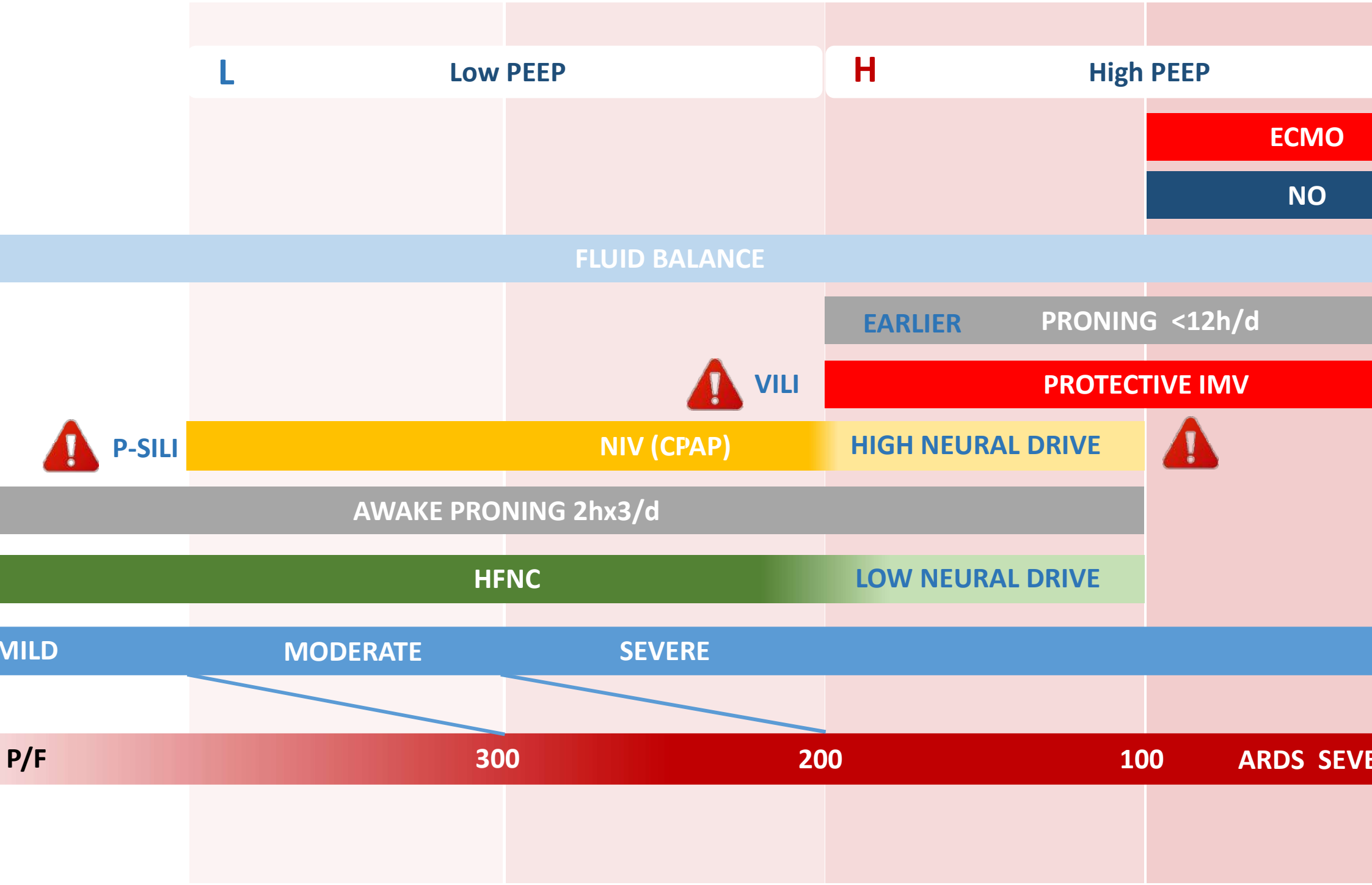
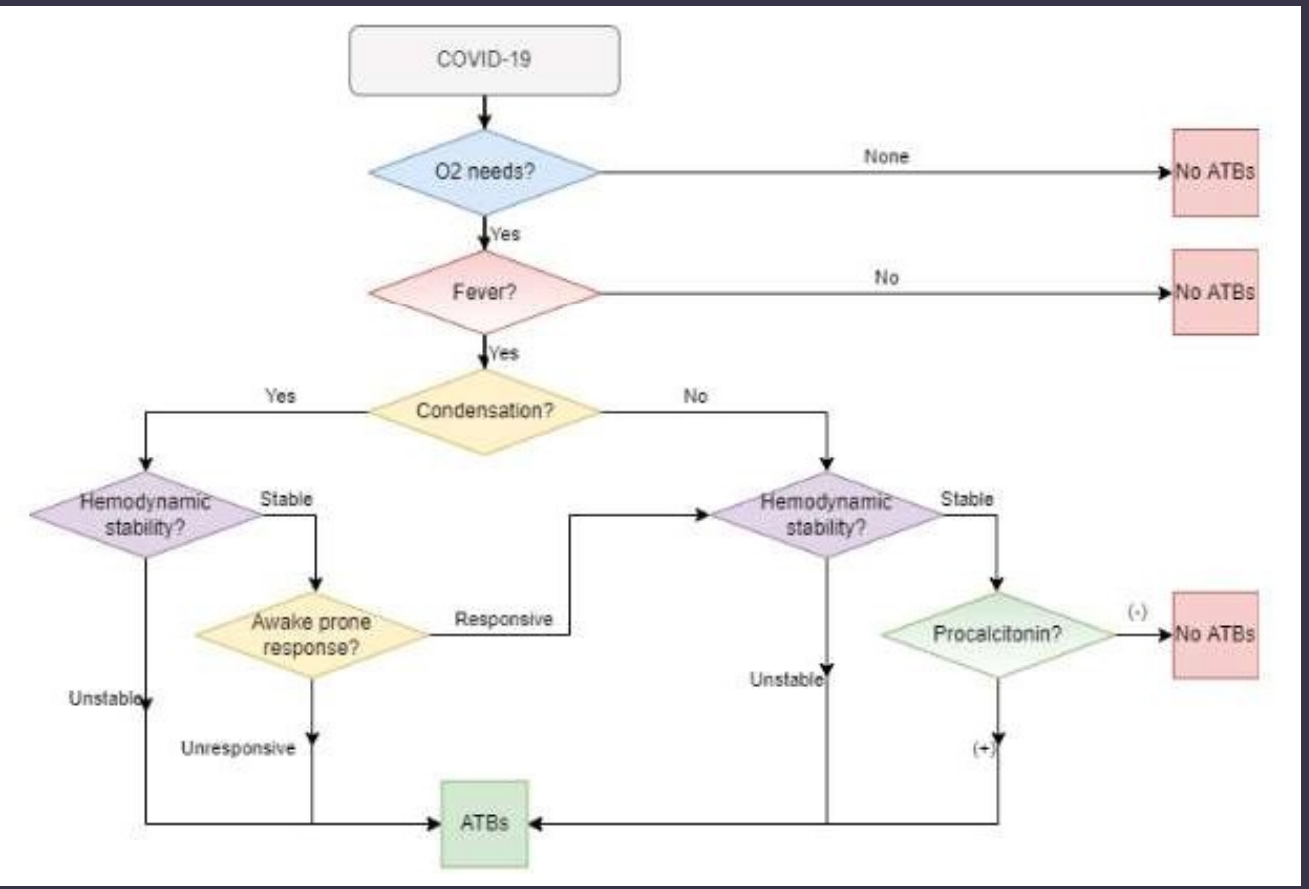
# **Pronostic COVID-19,** MICU Sousse



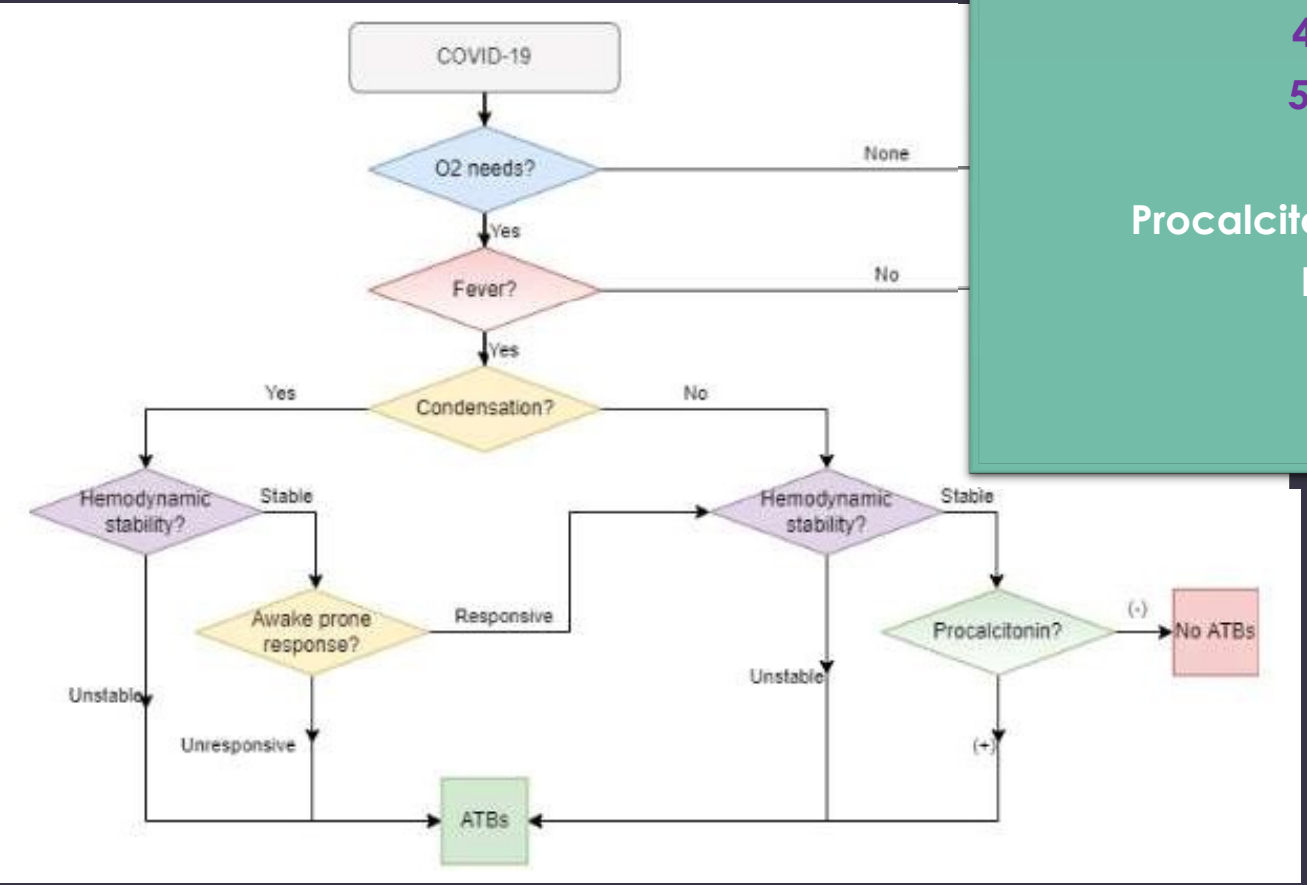
# **Q3**, COVID-19 Awake proning


L
Low PEEP
H
High PEEP
ECMO
NO
FLUID BALANCE
EARLIER
PRONING <12h/d
VILI
PROTECTIVE IMV
P-SILI
NIV (CPAP)
HIGH NEURAL DRIVE
AWAKE PRONING 2hx3/d
HFNC
LOW NEURAL DRIVE
MILD
MODERATE
SEVERE
P/F
300
200
100
ARDS SEVE

# **Q4**, COVID-19 ATB algorithm



# **Q4**, COVID-19 ATB algorithm




**470 patients covid sévère à critique**

**50% ventilation mécanique invasive**

**Fièvre 21,7% à l'admission**

**Procalcitonine réalisée chez 53(11,3%) à l'admission**

**Procalcitonine 0,4[0,17-1,15] ng/ml**

**Prescription ATB globale, 52,5%**

**DDJ, 650/1000j**

# Q4, COVID

ELSEVIER journa

Systematic review

Bacterial co-infection a
19: a living rapid revie



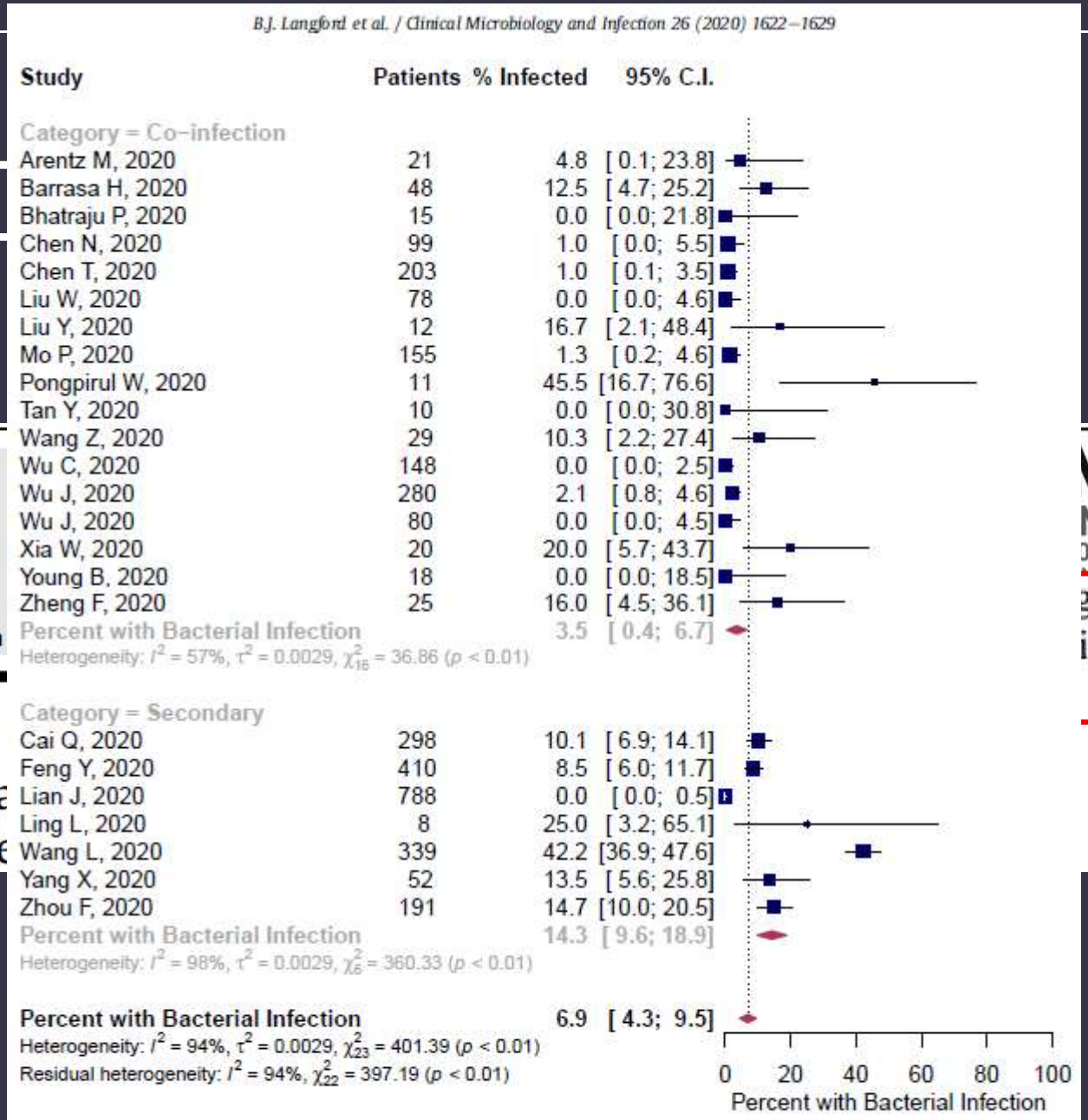



**Fig. 2.** Percentage of patients with COVID-19 and bacterial co-infection or secondary infection.

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gents was re-
ity of patients

# Q4, COVID

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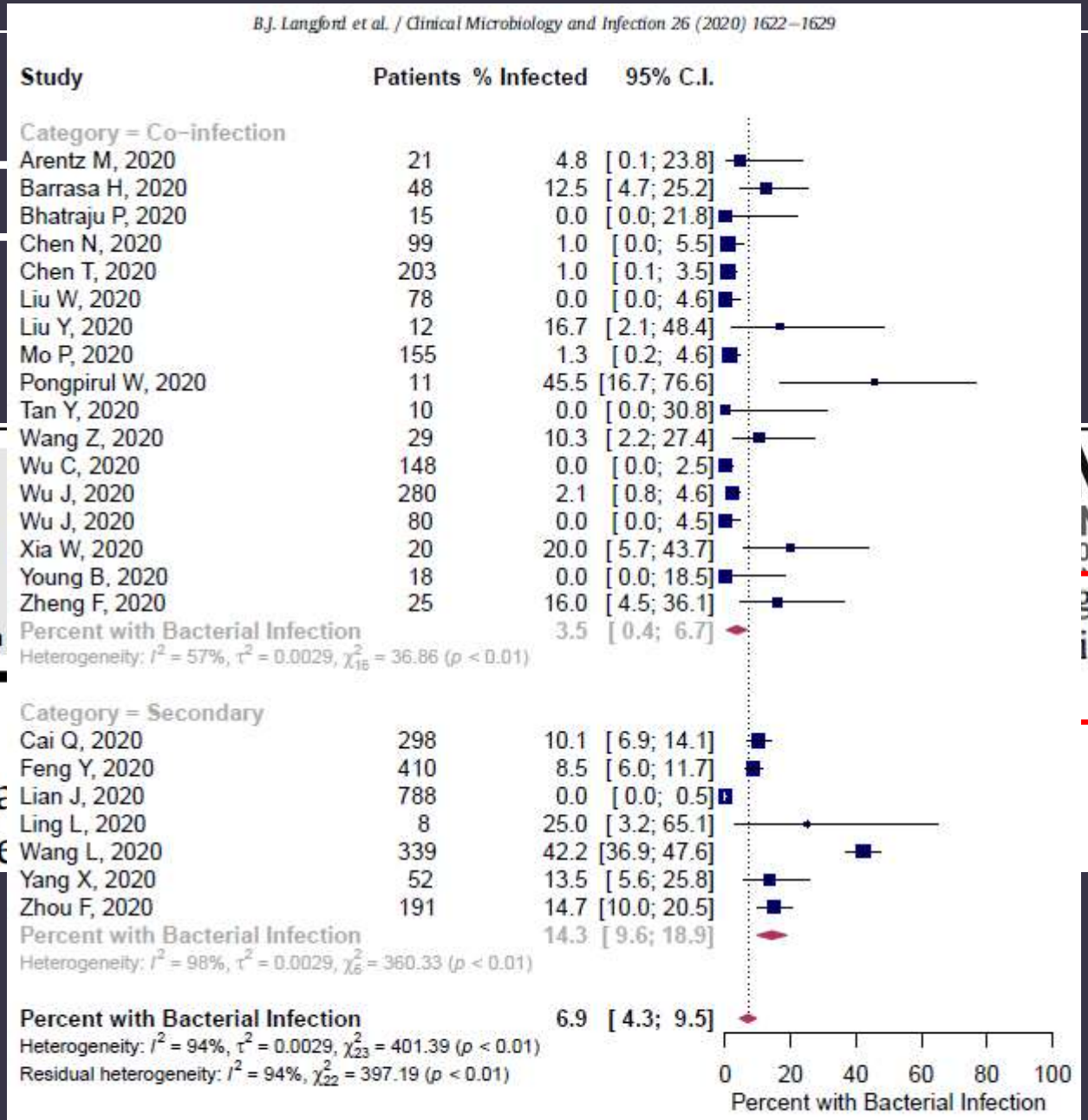


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# **Q4**, COVID-19 ATB algorithm

RESEARCH PAPER

**Bacterial coinfections and secondary infections in COVID-19 patients from a tertiary care hospital of northern India: Time to adhere to culture-based practices**

Out of the total patient sample, 75% had alread
received empirical antibiotics before the samples
were sent for analysis.

This is troublesome because none of the patients' bacterial culture or inflammatory markers, such as the erythrocyte sedimentation rate or C-reactive protein, were evaluated, and only 73 (15.2%) underwent radiological investigations.

Overall, 17.9% of culture
were positive for bacterial infections. Out of the

A total of 72.1% ($N = 347$) of COVID-19 patients received antibiotics, either before or during admission

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021 by The Americ

Antibiotic Overuse for COVID-19: Are We Adding Insult to Injury?

# **Q4**, COVID-19 ATB algorithm

RESEARCH Open Access

Inadequate use of antibiotics in the covid-19 era: effectiveness of antibiotic therapy

total of 13,932 patients included in this study, antibiotics were used in 12,238 (87.8%) and not used in 1498 (10.8%).

rates of bacterial infection of < 10% were found

RESEARCH Open Access

Low frequency of community-acquired bacterial co-infection in patients hospitalized for COVID-19 based on clinical, radiological and microbiological criteria: a retrospective cohort study

Antibiotics were initiated in 228 (81%) patients within 72 h of admission (Table 2).

**Results:** Among 281 included COVID-19 patients, bacterial co-infection was classified as unlikely in 233 patients (82.9%), possible in 35 patients (12.4%) and probable in 3 patients (1.1%). Ten patients (3.6%) could not be classified

# Q5, COVID-19 Corticosteroids

Research

AMA | Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

Effect of 12 mg vs 6 mg of Dexamethasone on the Number of Days Alive Without Life Support in Adults With COVID-19 and Severe Hypoxemia
The COVID STEROID 2 Randomized Trial

he COVID STEROID 2 Trial Group

EDITORIAL

Glucocorticoid Dose in COVID-19
Lessons for Clinical Trials During a Pandemic

Steven A. Webb, MD, PhD; Alisa M. Higgins, PhD; Colin J. McArthur, MBChB

# **Q6**, COVID-19 Anti-IL6

# **Q7**, COVID-19 Delirium

**Interpretation** Acute brain dysfunction was highly prevalent and prolonged in critically ill patients with COVID-19. Benzodiazepine use and lack of family visitation were identified as modifiable risk factors for delirium, and thus these data present an opportunity to reduce acute brain dysfunction in patients with COVID-19.

## Prevalence and risk factors for delirium in critically ill patients with COVID-19 (COVID-D): a multicentre cohort study

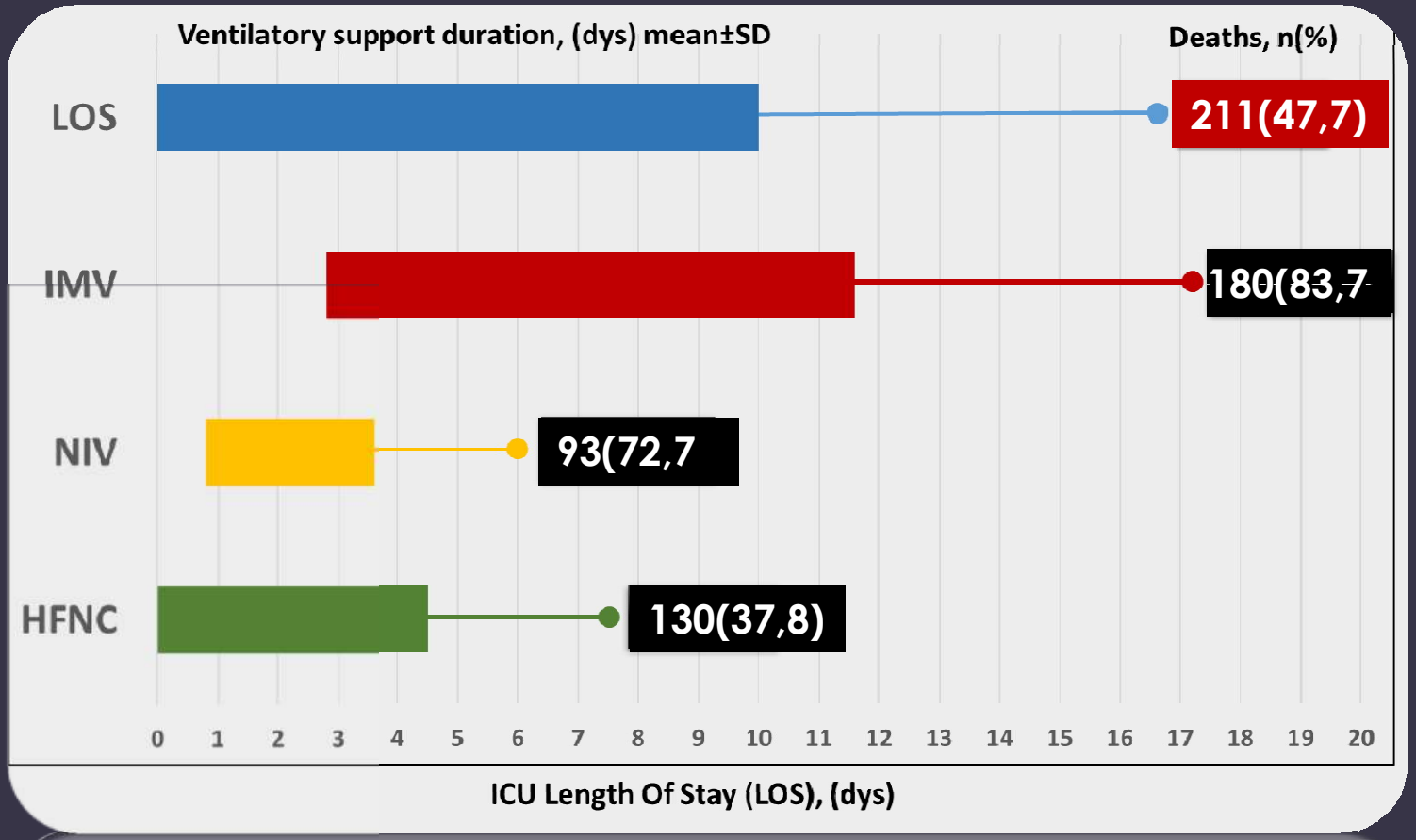
*Brenda T Pun*, Rafael Badenes*, Gabriel Heras La Calle, Onur M Orun, Wencong Chen, Rameela Raman, Beata-Gabriela K Simpson, Stephanie Wilson-Linville, Borja Hinojal Olmedillo, Ana Vallejo de la Cueva, Mathieu van der Jagt, Rosalía Navarro Casado, Pilar Leal Sanz, Günseli Orhun, Carolina Ferrer Gómez, Karla Núñez Vázquez, Patricia Piñeiro Otero, Fabio Silvio Taccone, Elena Gallego Curto, Anselmo Caricato, Hilde Woien, Guillaume Lacave, Hollis R O'Neal Jr, Sarah J Peterson, Nathan E Brummel, Timothy D Girard, E Wesley Ely, Pratik P Pandharipande, for the COVID-19 Intensive Care International Study Group†*

**P** résence
**C** onstante
**R** assurante

# Vignette 2

48h plutard, stagnation de l'état ventilatoire avec IRA modérée à sévère persistante, une polypnée rapide et superficielle. Une FiO2 supérieure à 70% malgré les sessions multiples de DV. Un essai bref de deux heures de CPAP puis de VNI n'autorise pas de modification significative de la clinique et de la SpO2.

# **Q8**, COVID-19 ventilatory management



# Vignette 3

La reventilation se complique immediatement par une ascencion thermique à 39°C sans instabilité hémodynamique alors que le rapport P/F s'améliore profitant des premières heures du DV.

# Q10, COV

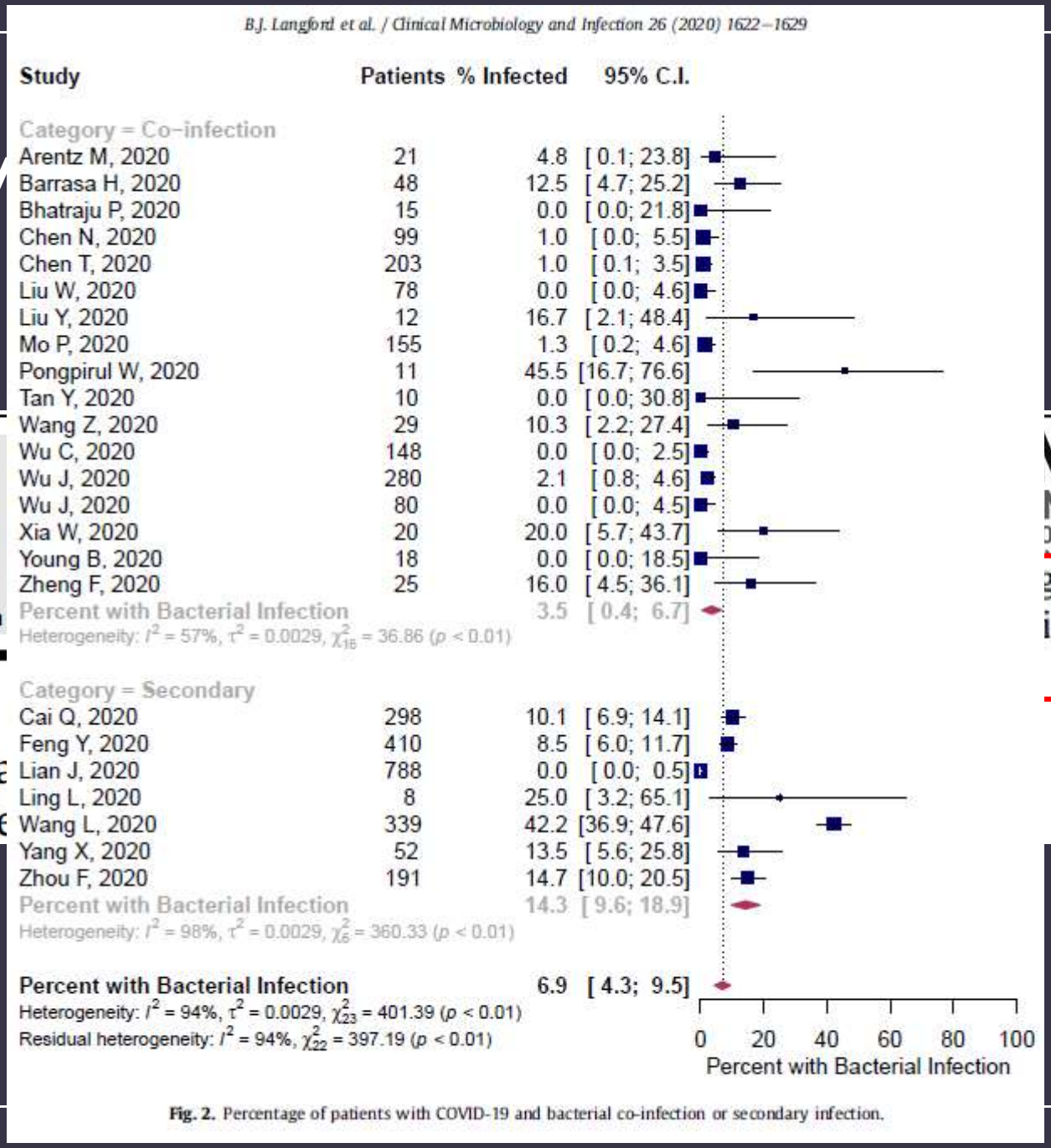
ELSEVIER

journa

Systematic review

Bacterial co-infection a
19: a living rapid revie



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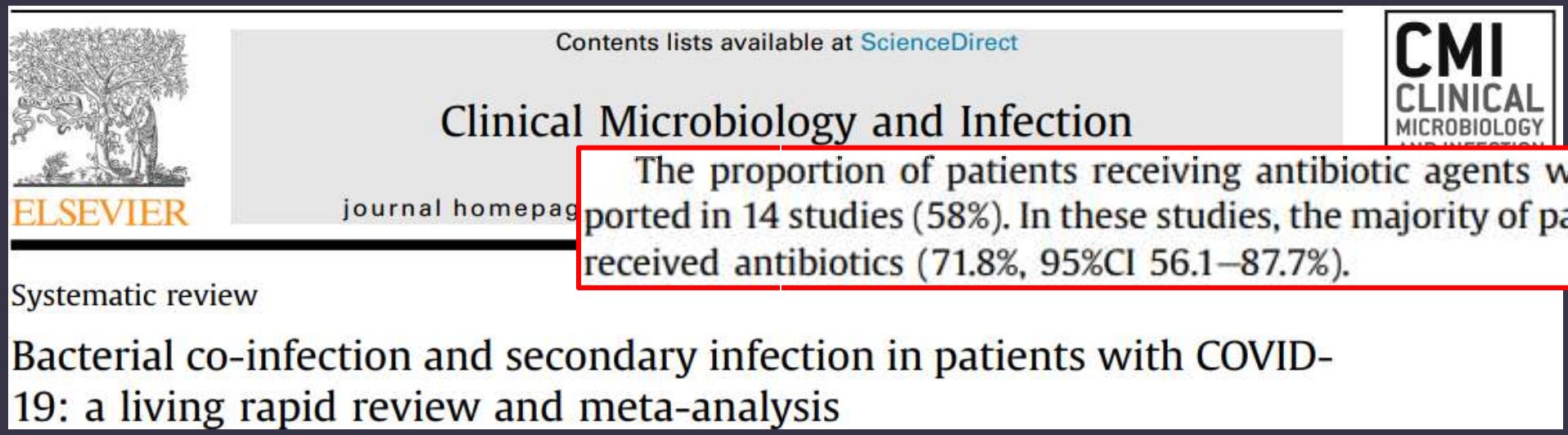

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CMI CLINICAL MICROBIOLOGY

ELSEVIER

The proportion of patients receiving antibiotic agents was reported in 14 studies (58%). In these studies, the majority of patients received antibiotics (71.8%, 95%CI 56.1–87.7%).

Systematic review

Bacterial co-infection and secondary infection in patients with COVID-19: a living rapid review and meta-analysis

# **Q13**, COVID-19 **AOP** (Airway Opening Pressure, PT / PV curves)

# Vignette 4

**Après 2 jours de VMI et deux séances de DV de 12h. Sous analgo-sedation et curares. Vt, 6ml/Kg, FR, 30c/mn, PEEP, 10cmH2O, Pplat, 28cmH2O, FiO2, 0.7, P/F, 70 passe à 200.**

# **Q14**, COVID-19 MV / **VIDD**

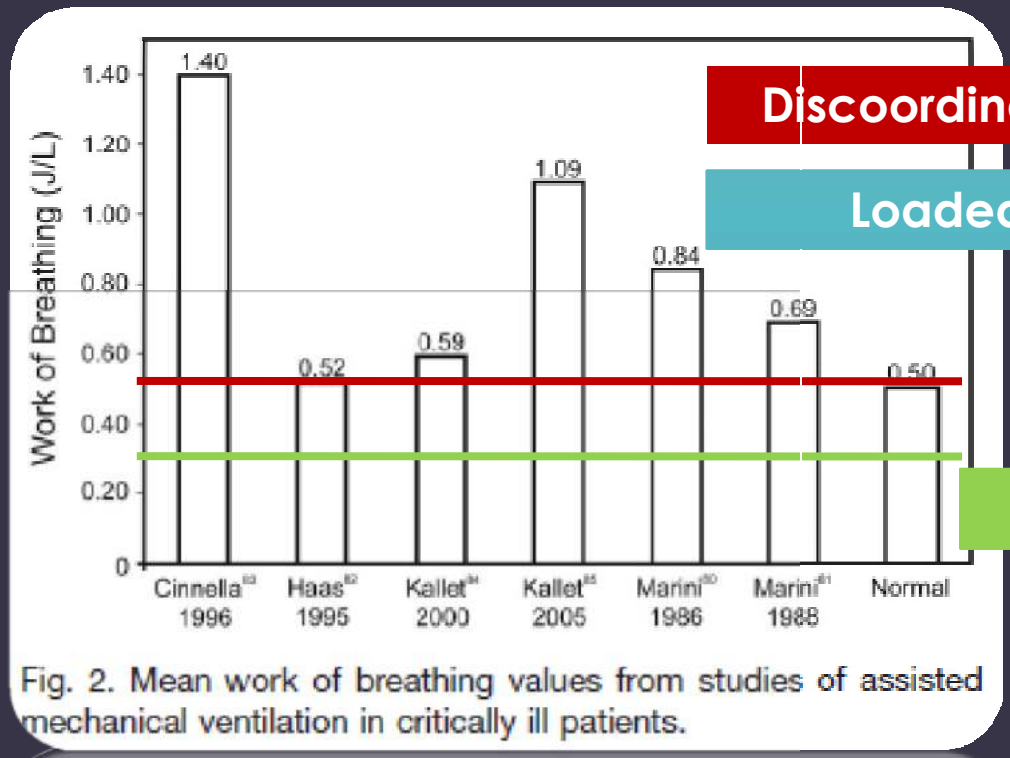



Fig. 2. Mean work of breathing values from studies of assisted mechanical ventilation in critically ill patients.

**Discoordinated Breathing**

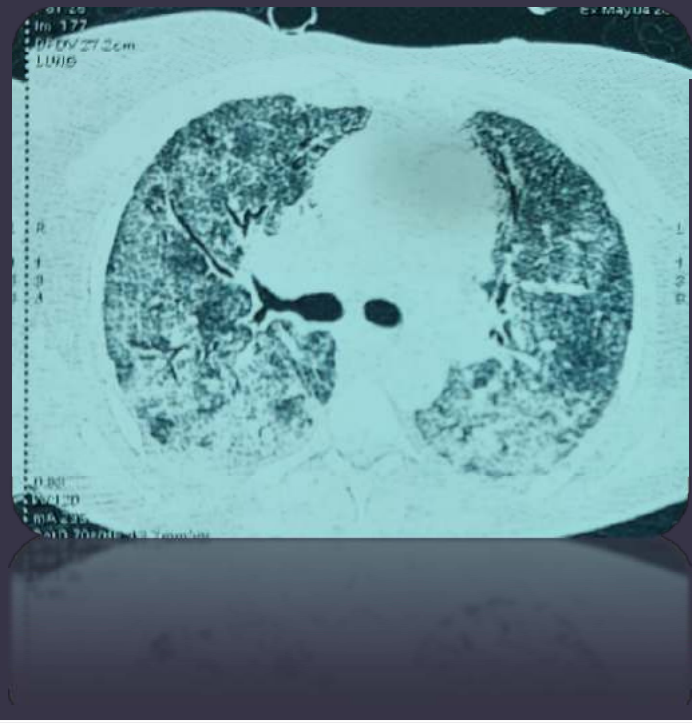
**Loaded Breathing**

**VIDD**

# Vignette 5

**J12. Sevrage ventilatoire long et laborieux. Stagnation voire aggravation malgré plusieurs séances de DV.**

**Fièvre, instabilité hémodynamique, majoration des oedèmes et extension des images radiologiques.**



# Vignette 6

**Après des efforts d'alimentation, une gestion du delirium et de mobilisation précoce et quotidienne sous ventilateur, on arrive à séparer la patiente du ventilateur puis de la trachéotomie,**

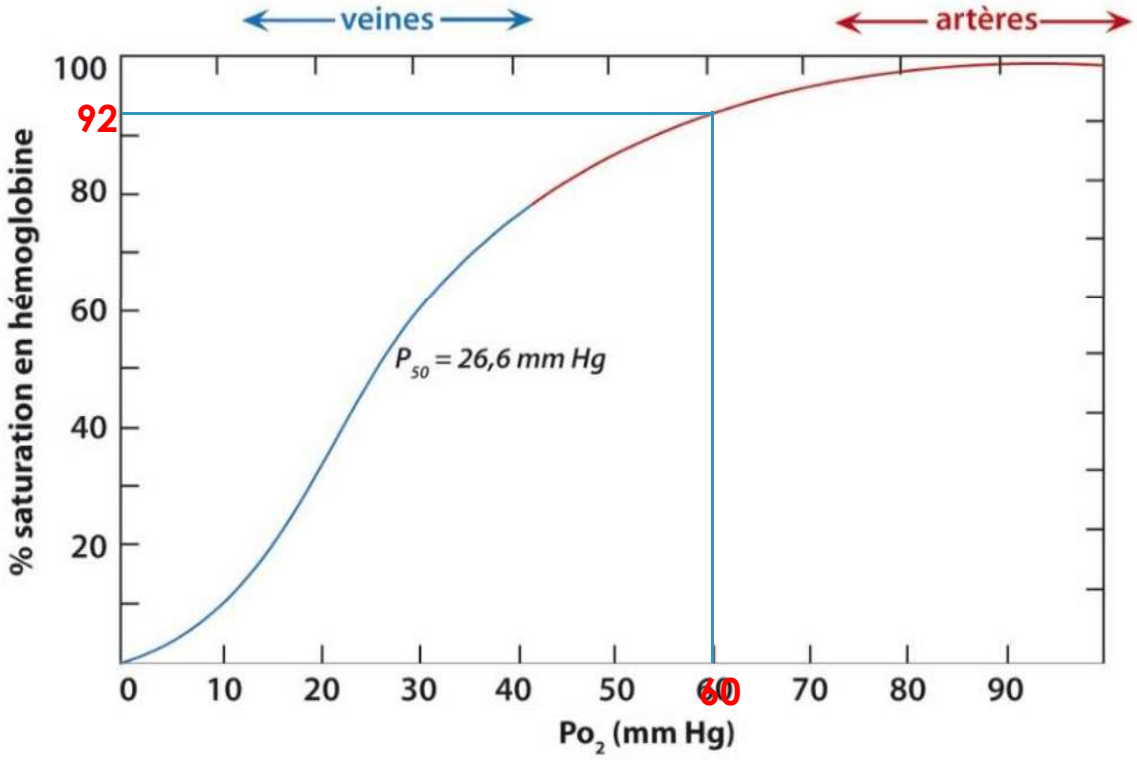
**La SpO2 à l'air ambiant au repos se stabilize entre 88-92% pendant les dernières 24h.**

# Q18, SpO2 et OCD

**METHODS**

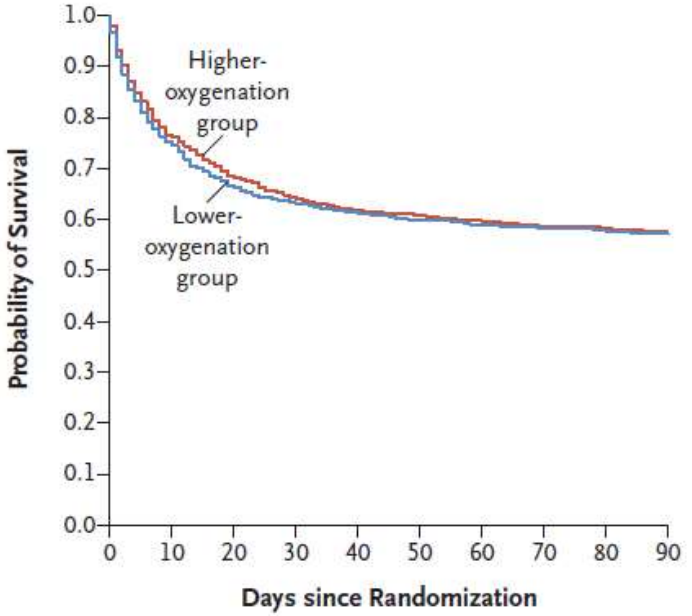
In this multicenter trial, we randomly assigned 2928 adult patients who had recently been admitted to the ICU (≤12 hours before randomization) and who were receiving at least 10 liters of oxygen per minute in an open system or had a fraction of inspired oxygen of at least 0.50 in a closed system to receive oxygen therapy targeting a $Pao_2$ of either 60 mm Hg (lower-oxygenation group) or 90 mm Hg (higher-oxygenation group) for a maximum of 90 days. The primary outcome was death within 90 days.

# Q18, SpO2 et OCD




The NEW ENGLAND JOURNAL of MEDICINE

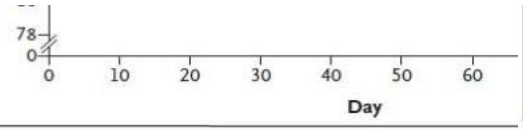
ORIGINAL ARTICLE




| | | | | |
|---|---|---|---|---|
| tion group | 1447 | 933 | 865 | 834 |
| ion group | 1441 | 912 | 851 | 824 |

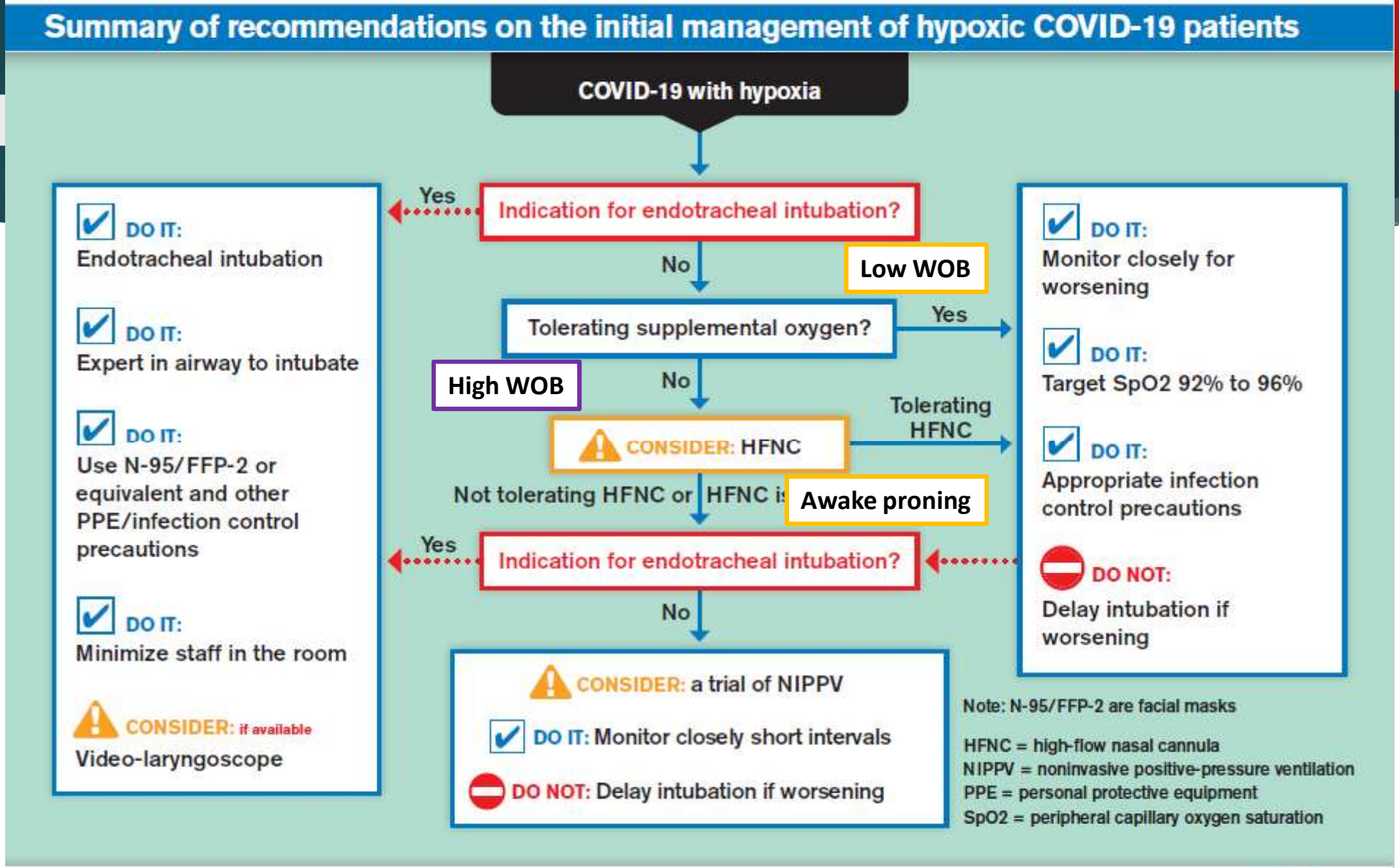
**an–Meier Estimates of Survival.**

e results of Kaplan–Meier analysis of data regarding survival, lministratively censored at 90 days (adjusted hazard ratio, 1.04, 95% confidence interval, 0.93 to 1.16). The Cox proportional-hazards model was adjusted for the trial site and for the presence or absence of chronic obstructive pulmonary disease or active hematologic cancer.



# Stratégie

# COVID-19 Resources




Society of Critical Care Medicine

Surviving Sepsis Campaign

# Conclusion

MEDICINE

Review Article

## Invasive and Non-Invasive Ventilation in Patients With COVID-19

Wolfram Windisch, Steffen Weber-Carstens, Stefan Kluge, Rolf Rossaint, Tobias Welte, Christian Karagiannidis

# Conclusion

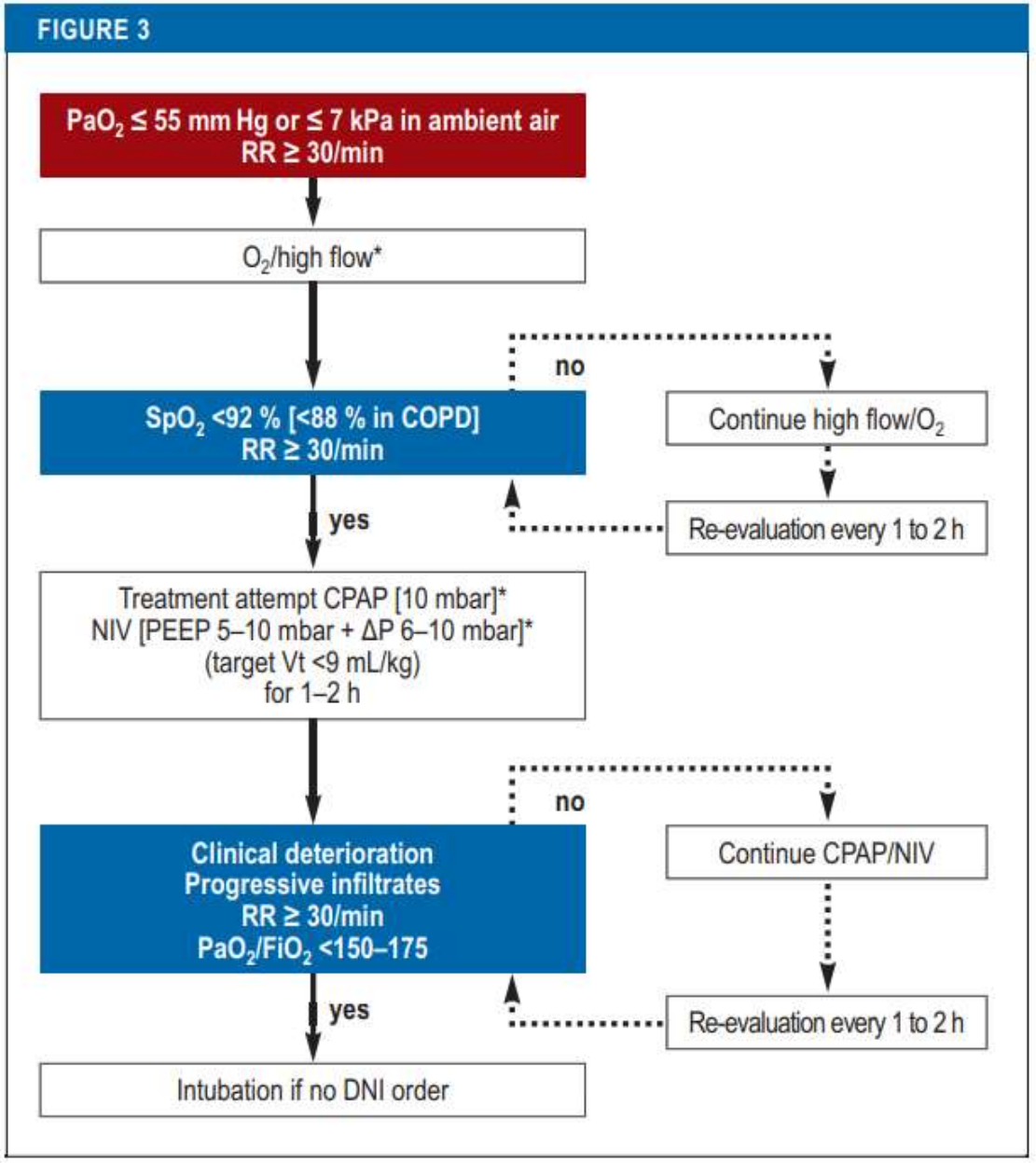
MEDICINE

Review Article

## Invasive and Non-Invasive in Patients With COVID-19

Wolfram Windisch, Steffen Weber-Carstens, Stefan Kluge, Rolf Ro
Christian Karagiannidis

FIGURE 3




**Possible instrument-based treatment escalation** in the case of acute respiratory insufficiency as a result of COVID-19, as recommended in the position paper of the German Respiratory Society (DGP) (1).