Insuffisance respiratoire aiguë chez l'immunodéprimé

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Déclaration de liens

- **Gilead: consultant, interventions congrès, participations congrès**

SEVEN-DAY PROFILE PUBLICATION

Acute hypoxemic respiratory failure in immunocompromised patients: the Efraim multinational prospective cohort study

Azoulay, Intensive Care Med 2017

N=1.611 immunocompromised patients admitted to 62 ICUs in 16 countries for acute respiratory failure

100 with missing data on initial oxygenation strategy

596 (37.0%) received first line intubation and mechanical ventilation (IMV)

915 (56.8%) were not intubated at ICU admission and received standard O2, noninvasive ventilation (NIV) or high flow oxygen through nasal cannula (HFNC)

- **O2 N=496**
- **HFNC N=187**
- **HFNC + NIV N=79**
- **NIV N=153**

N=56 with Do Not Intubate order

N=859 without Do-Not-Intubate order

- **O2 N=466**
- **HFNC N=182**
- **HFNC + NIV N=75**
- **NIV N=136**

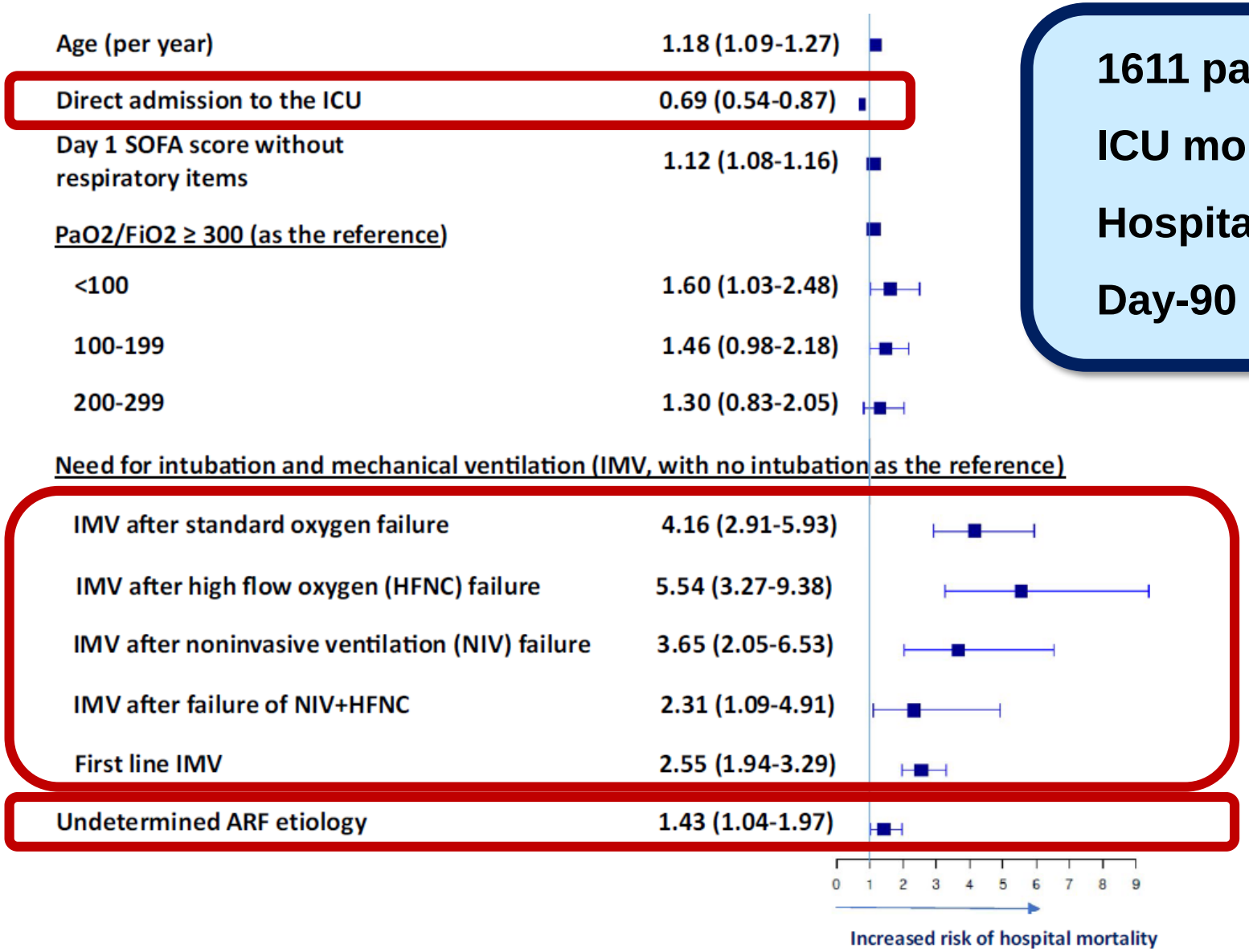
[HFNC ± NIV=257] [NIV ± HFNC=211]

IMV: 54 (54%)	**IMV: 596 (100%)**	**IMV: 190 (40.8%)**	**IMV: 77 (42.3%)**	**IMV: 32 (42.7%)**	**IMV: 54 (39.7%)**	**IMV: 1 (1.8%)**
Hospital Mortality: 33% (33 deaths) Unknown: 6	**Hospital Mortality:** 52.5% (313 deaths) Unknown: 22	**Hospital Mortality:** 34.8% (162 deaths) Unknown: 15	**Hospital Mortality:** 37.9% (69 deaths) Unknown: 14	**Hospital Mortality:** 33.3% (25 deaths) Unknown: 2	**Hospital Mortality:** 38.2% (52 deaths) Unknown: 7	**Hospital Mortality:** 50% (28 deaths) Unknown: 0

SEVEN-DAY PROFILE PUBLICATION

Acute hypoxemic respiratory failure in immunocompromised patients: the Efraim multinational prospective cohort study

Azoulay, Intensive Care Med 2017



1611 patients

ICU mortality 32%

Hospital mortality 44%

Day-90 mortality 56%

5 questions-clés

- **Quels critères d'admission en réanimation?**
- **Quel support ventilatoire?**
- **Comment orienter la démarche diagnostique?**
- **Le LBA est-il encore utile?**
- **Thérapies innovantes: nouvelles toxicités, mais nouvelles opportunités…**

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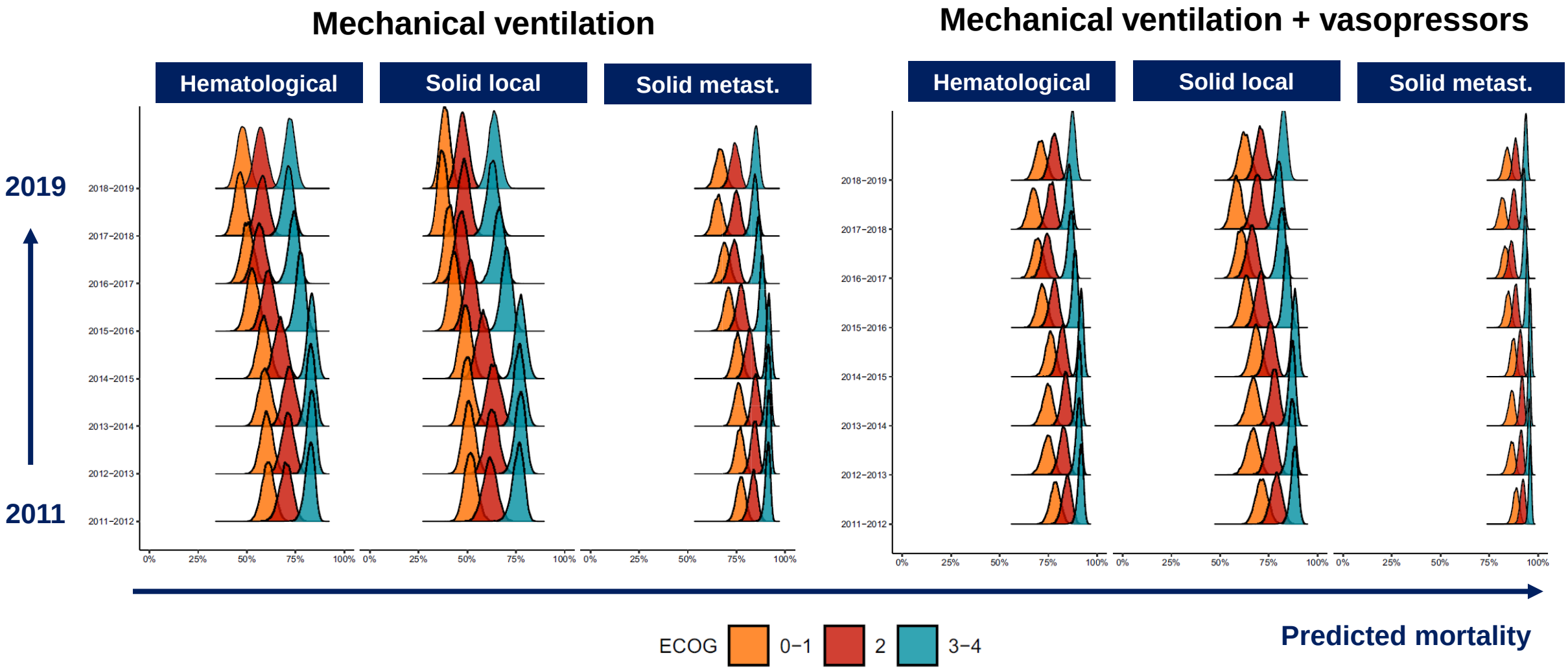
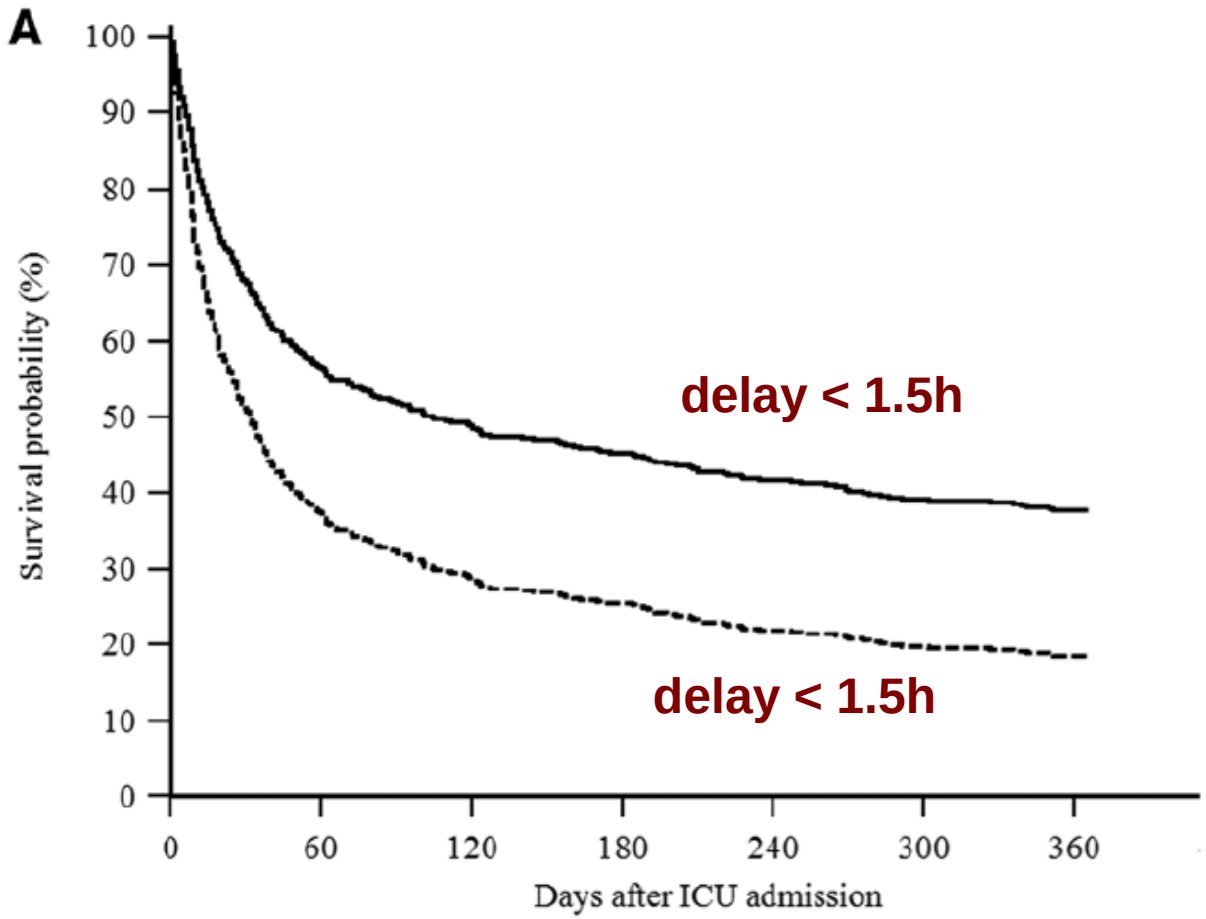
Performance status: un élément pronostique essentiel



FG. Zampieri et al. *Intensive Care Med. 2021 Feb;47(2):170-179*

Effect of Early Intervention on Long-Term Outcomes of Critically Ill Cancer Patients Admitted to ICUs*

Dae-Sang Lee, MD[1]; Gee Young Suh, MD, PhD[1,2]; Jeong-Am Ryu, MD[1]; Chi Ryang Chung, MD[1]; Jeong Hoon Yang, MD, PhD[1,3]; Chi-Min Park, MD, PhD[1,4]; Kyeongman Jeon, MD, PhD[1,2]

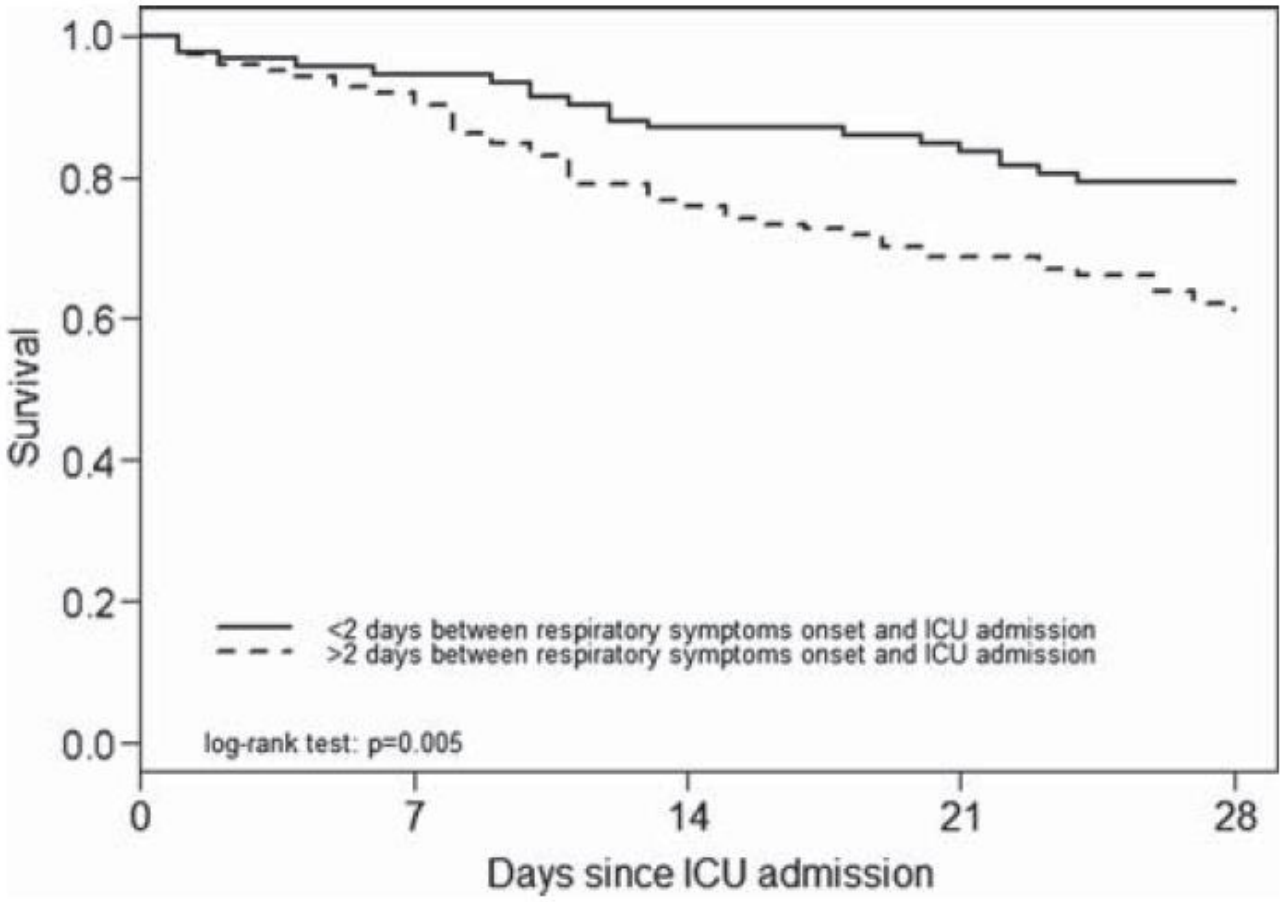


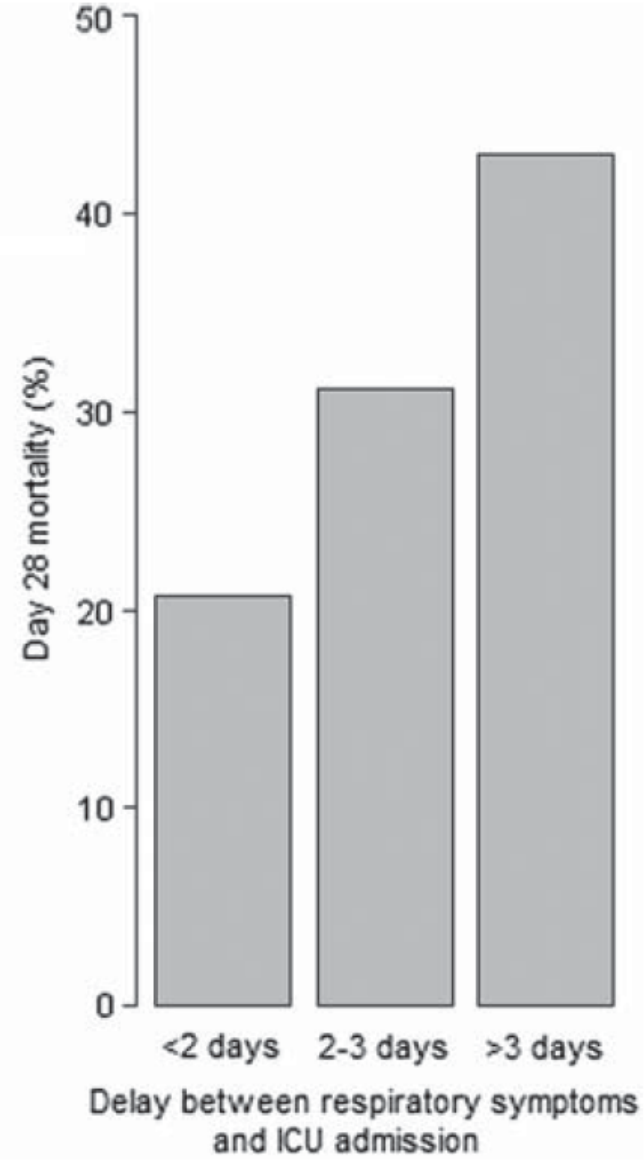
Medical Emergency Team Criteria[a]	No. of Patients (%)
Airway and breathing	
Acute respiratory distress: respiratory rate ≤ 8 or ≥ 30 breaths/min	237 (45)
Acute hypoxia: oxygen saturation derived from pulse oximetry < 90% for 5 min, despite previous oxygen administration	245 (47)
Acute hypercapnia and acute acidosis: arterial carbon dioxide pressure >50 mm Hg and pH < 7.3	62 (12)
Upper airway obstruction: stridor or use of respiratory accessory muscle	52 (10)
Circulation	
Unexplained hypotension: systolic blood pressure < 90 mm Hg	222 (42)
Acute chest pain	7 (1)
Bradycardia or tachycardia: heart rate < 50 or > 130 beats/min	268 (51)
Arrhythmia with symptom	39 (7)
Neurology	
Sudden mental change or unexplained agitation	67 (13)
Seizure	11 (2)
Bedside nurse concern about overall deterioration	19 (4)

Crit Care Med 2015; 43:1439–1448

Delayed intensive care unit admission is associated with increased mortality in patients with cancer with acute respiratory failure

Djamel Mokart[1], Jérôme Lambert[2], David Schnell[3], Louis Fouché[1], Antoine Rabbat[4], Achille Kouatchet[5], Virginie Lemiale[6], François Vincent[7], Etienne Lengliné[3], Fabrice Bruneel[8], Frederic Pene[6], Sylvie Chevret[2] & Elie Azoulay[3]





Mokart, Leuk Lymphoma 2012

5 questions-clés

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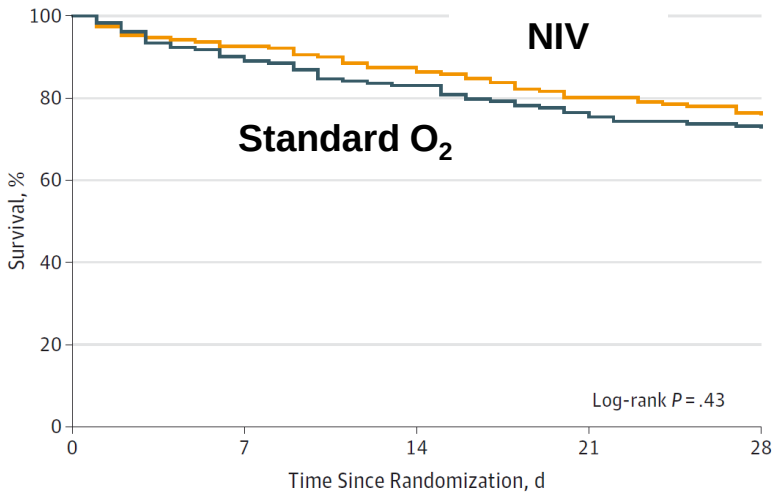
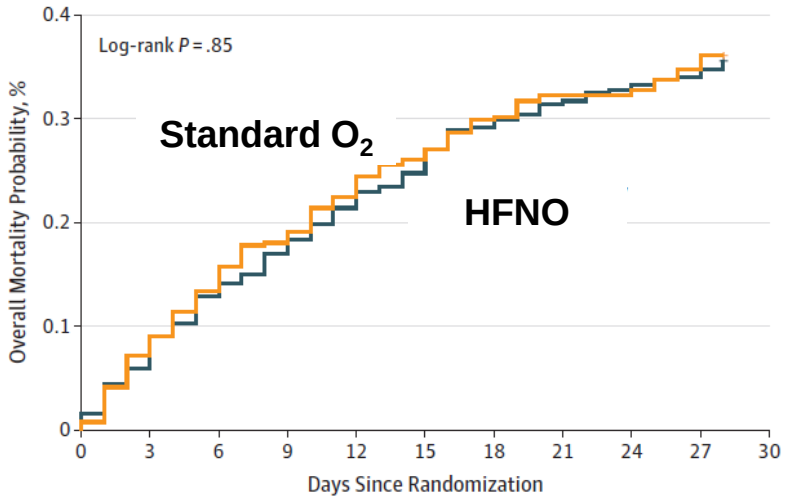
Quel support ventilatoire non-invasif?

Effect of Noninvasive Ventilation vs Oxygen Therapy on Mortality Among Immunocompromised Patients With Acute Respiratory Failure
A Randomized Clinical Trial



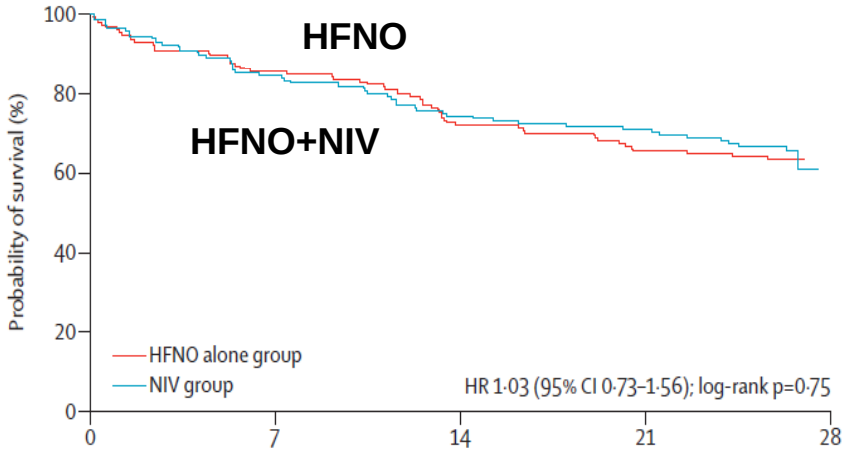
iVNIctus, V. Lemiale, et al., JAMA 2015

Effect of High-Flow Nasal Oxygen vs Standard Oxygen on 28-Day Mortality in Immunocompromised Patients With Acute Respiratory Failure
The HIGH Randomized Clinical Trial



HIGH, E Azoulay, et al., JAMA 2018

High-flow nasal oxygen alone or alternating with non-invasive ventilation in critically ill immunocompromised patients with acute respiratory failure: a randomised controlled trial



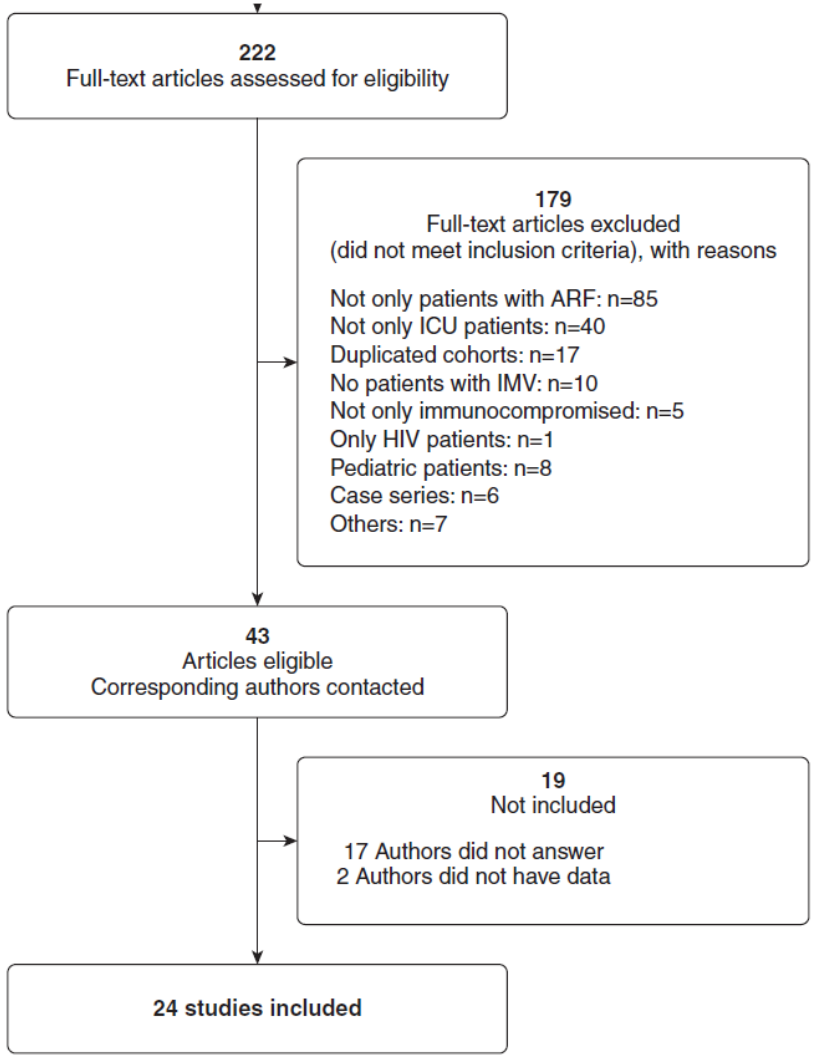
FLORALI-IM, R. Coudroy, et al., Lancet Respir Med 2022

Survival in Immunocompromised Patients Ultimately Requiring Invasive Mechanical Ventilation

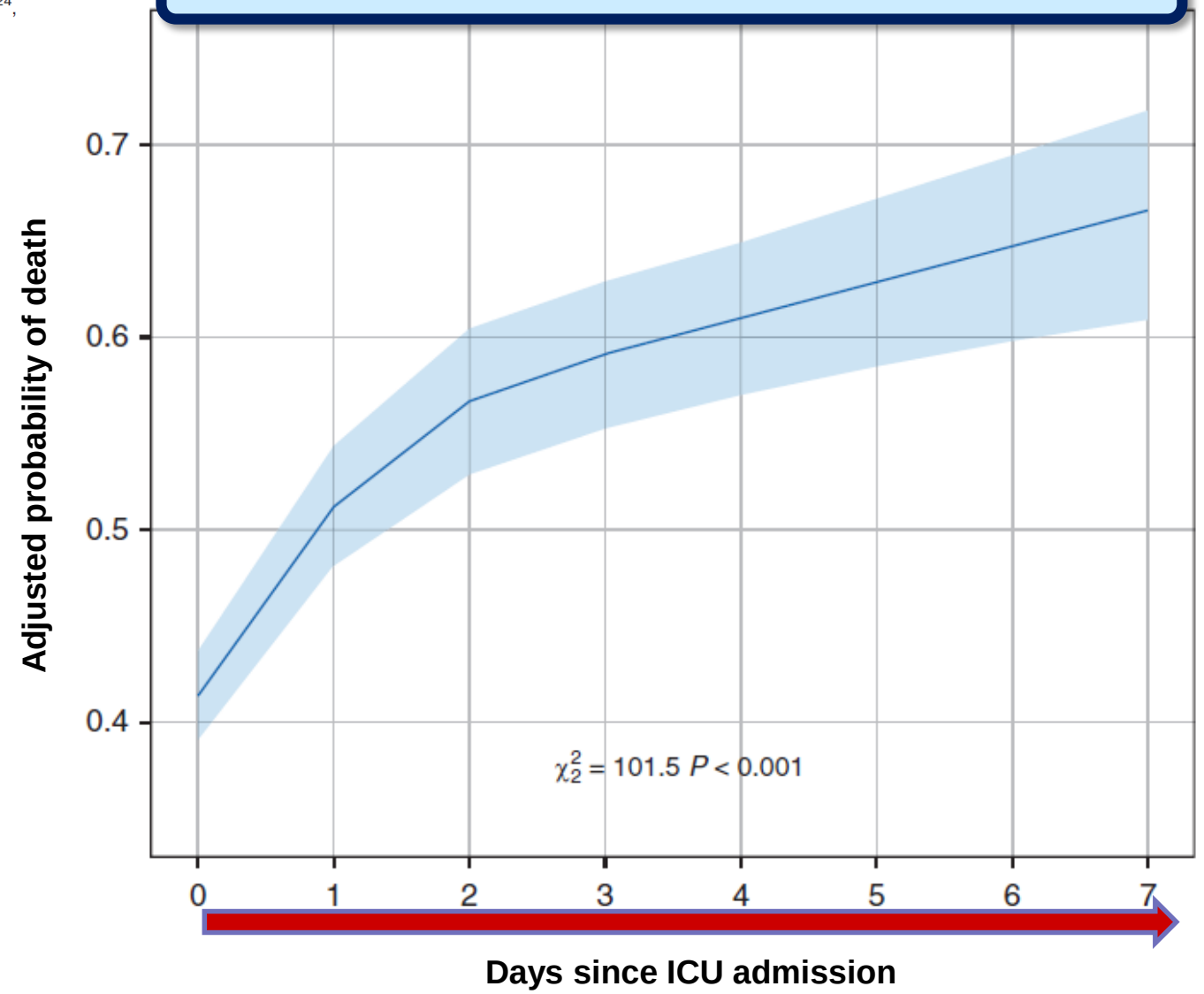
A Pooled Individual Patient Data Analysis

Am J Respir Crit Care Med Vol 204, Iss 2, pp 187–196, Jul 15, 2021

Guillaume Dumas[1,2], Virginie Lemiale[1,2], Nisha Rathi[3], Andrea Cortegiani[4], Frédéric Pène[5], Vincent Bonny[1,2], Jorge Salluh[6], Guillermo M. Albaiceta[7,8], Marcio Soares[6], Ayman O. Soubani[9], Emmanuel Canet[10], Tarik Hanane[11], Achille Kouatchet[12], Djamel Mokart[13], Pia Lebiedz[14], Melda Türkoğlu[15], Rémi Coudroy[16,17], Kyeongman Jeon[18,19], Alexandre Demoule[20], Sangeeta Mehta[21], Pedro Caruso[22], Jean-Pierre Frat[16,17], Kuang-Yao Yang[23,24], Oriol Roca[8,25,26], John Laffey[27,28], Jean-François Timsit[29], Elie Azoulay[1,2], and Michael Darmon[1,2]



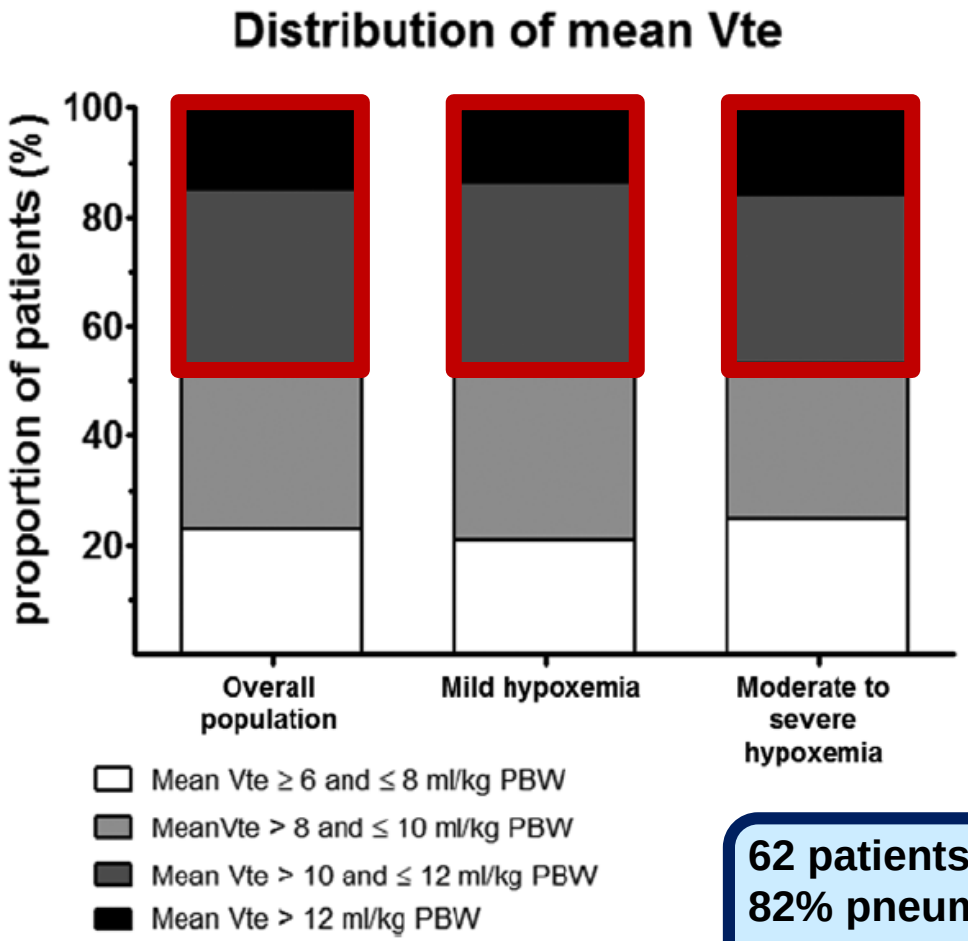
Time to intubation (days) 1.38 (1.26–1.52), p<0.001

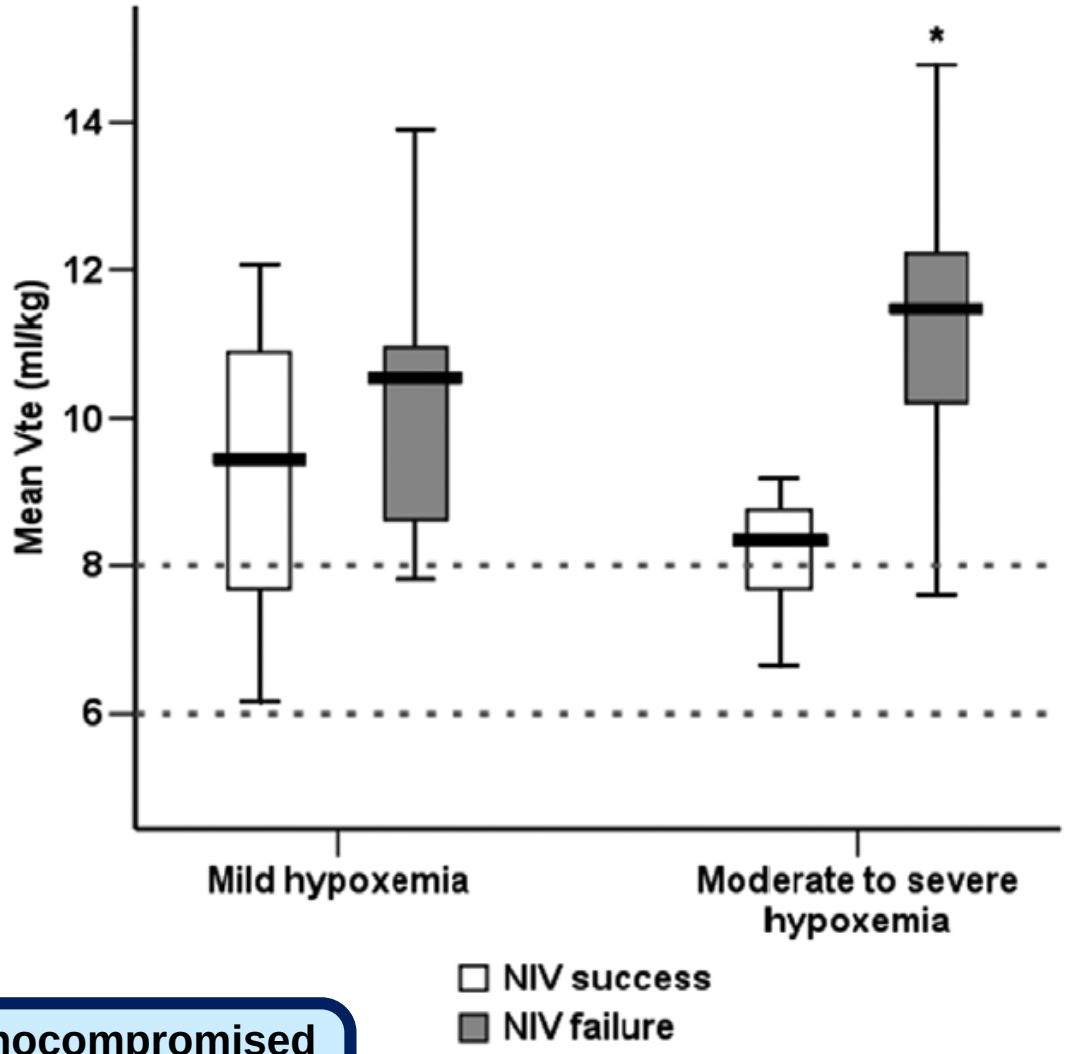


Failure of Noninvasive Ventilation for De Novo Acute Hypoxemic Respiratory Failure: Role of Tidal Volume

Crit Care Med 2016; 44:282–290

Guillaume Carteaux, MD[1,2,3]; Teresa Millán-Guilarte, MD[4]; Nicolas De Prost, MD, PhD[1,2,3]; Keyvan Razazi, MD[1,2,3]; Shariq Abid, MD, PhD[3]; Arnaud W. Thille, MD, PhD[5]; Frédérique Schortgen, MD, PhD[1,3]; Laurent Brochard, MD[3,6,7]; Christian Brun-Buisson, MD[1,2,8]; Armand Mekontso Dessap, MD, PhD[1,2,3]





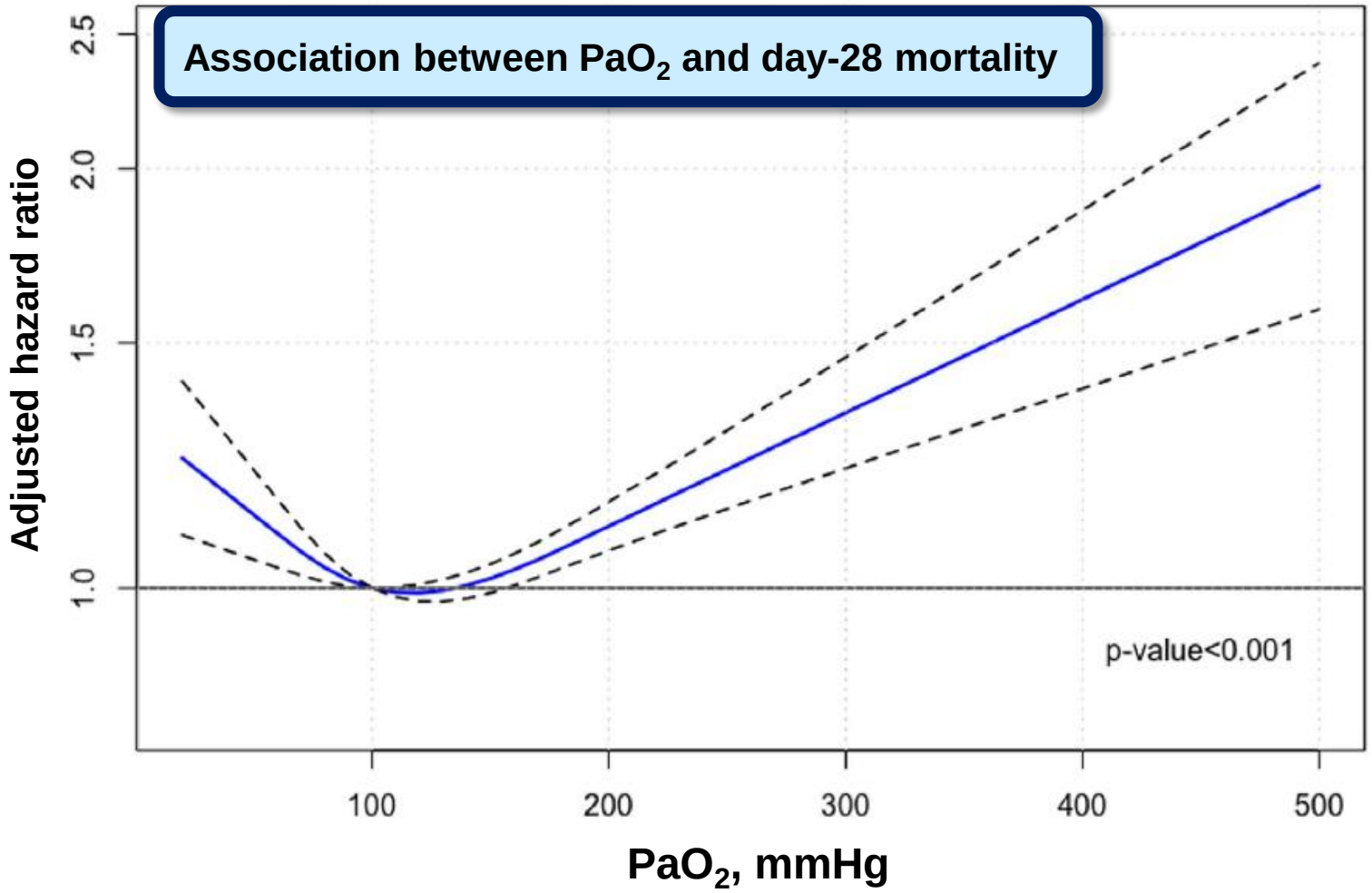
62 patients – 14 immunocompromised
82% pneumonia
NIV failure 52%

Association between arterial oxygen and mortality across critically ill patients with hematologic malignancies: results from an international collaborative network

11249 patients

24-h ventilatory support
- **Invasive MV 71%**
- **HFNO 15%**
- **NIV 14%**

28-day mortality 40%



G Dumas, et al., Intensive Care Med (2024) 50:697–711

ORIGINAL

Veno-venous extracorporeal membrane oxygenation (vv-ECMO) for severe respiratory failure in adult cancer patients: a retrospective multicenter analysis

Matthias Kochanek[1*], Jan Kochanek[1], Boris Böll[1], Dennis A. Eichenauer[1], Gernot Beutel[2], Hendrik Bracht[3],

Intensive Care Med (2022) 48:332–342
https://doi.org/10.1007/s00134-022-06635-y

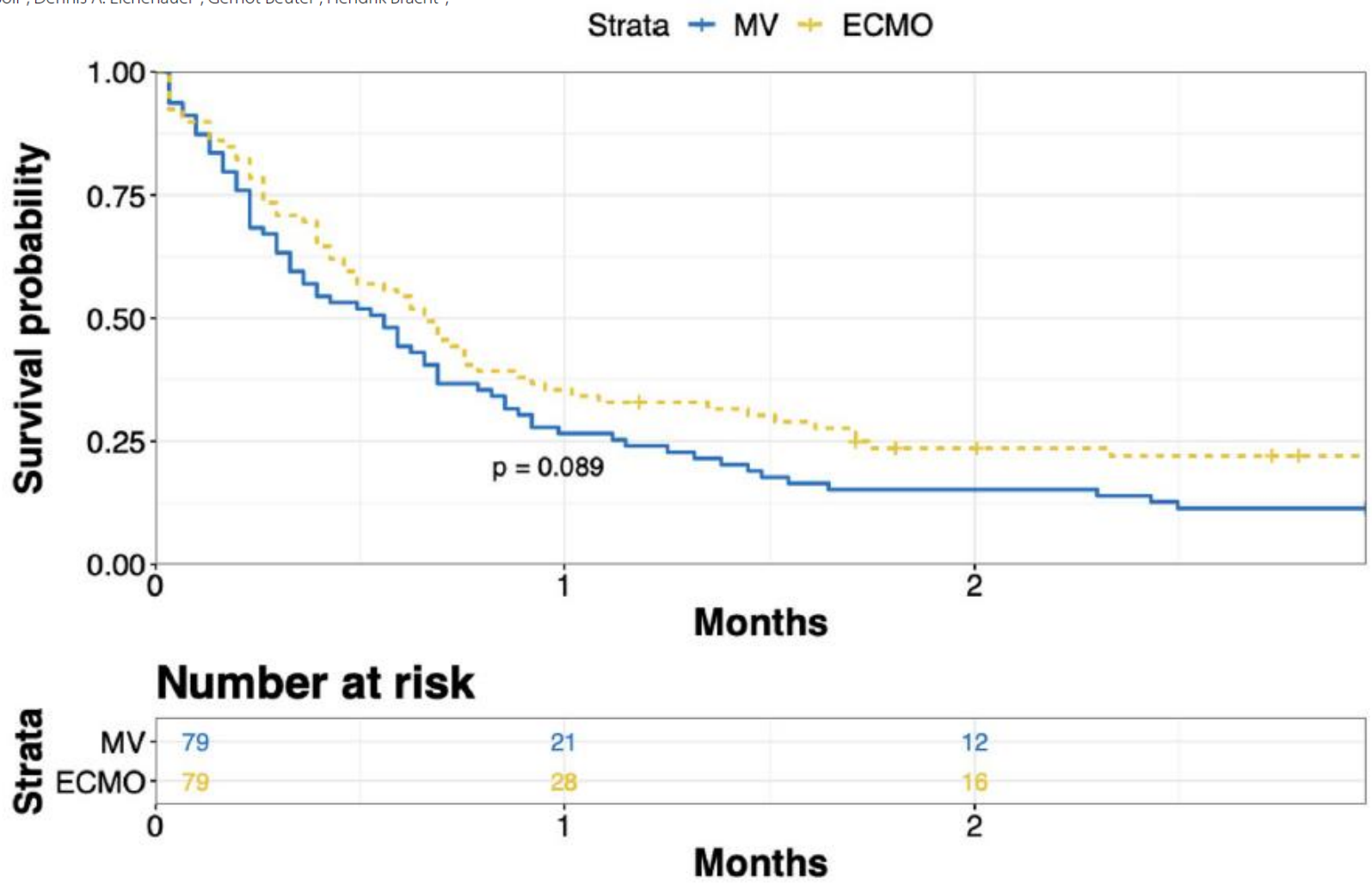


Fig. 2 Propensity score-matching patients receiving ECMO and those managed with mechanical ventilation (MV) only of the EFRAIM study [24]

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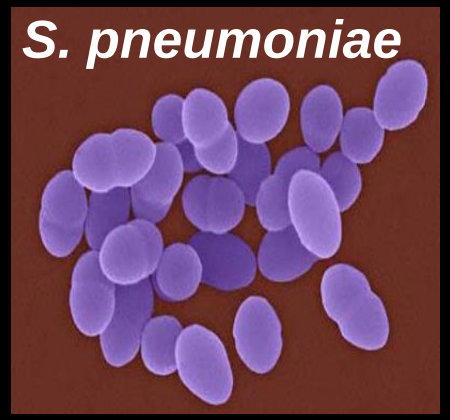
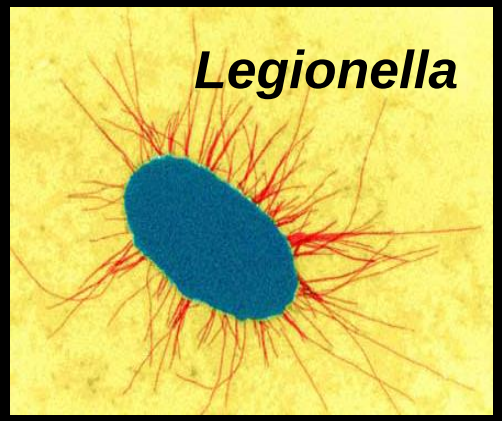
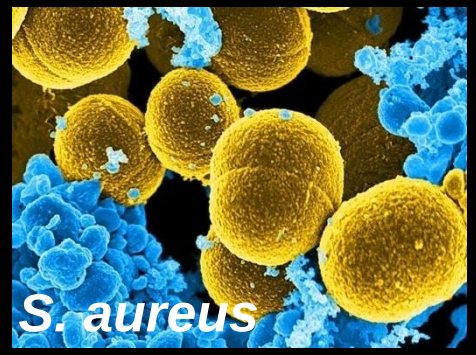
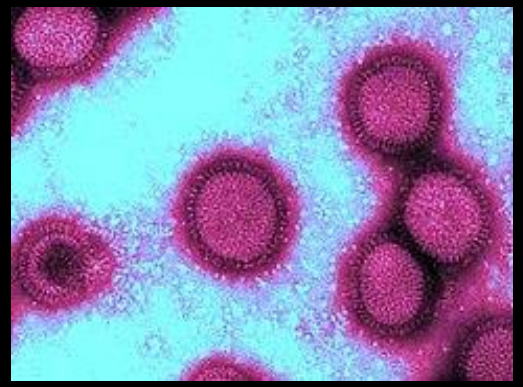




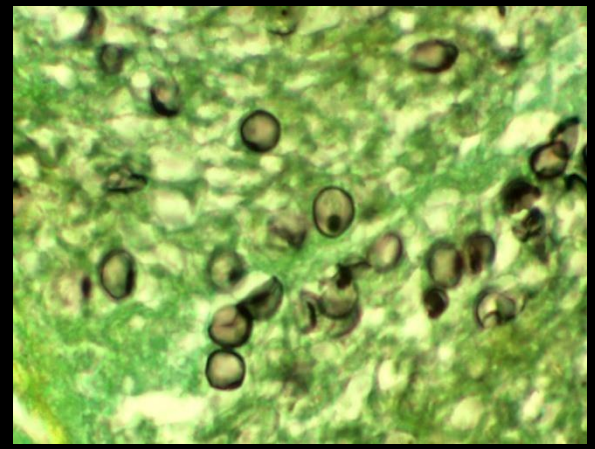
M. tuberculosis

Aspergillus

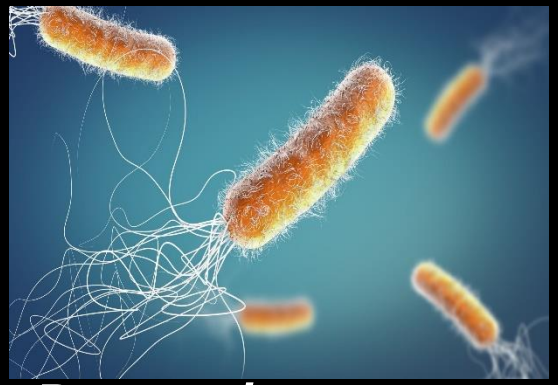




Grippe

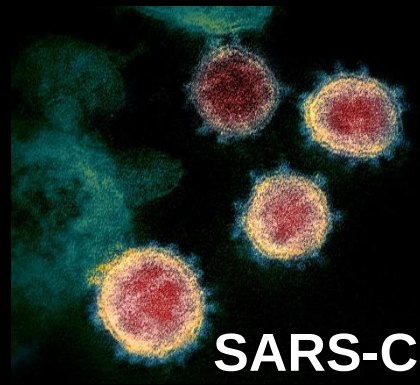


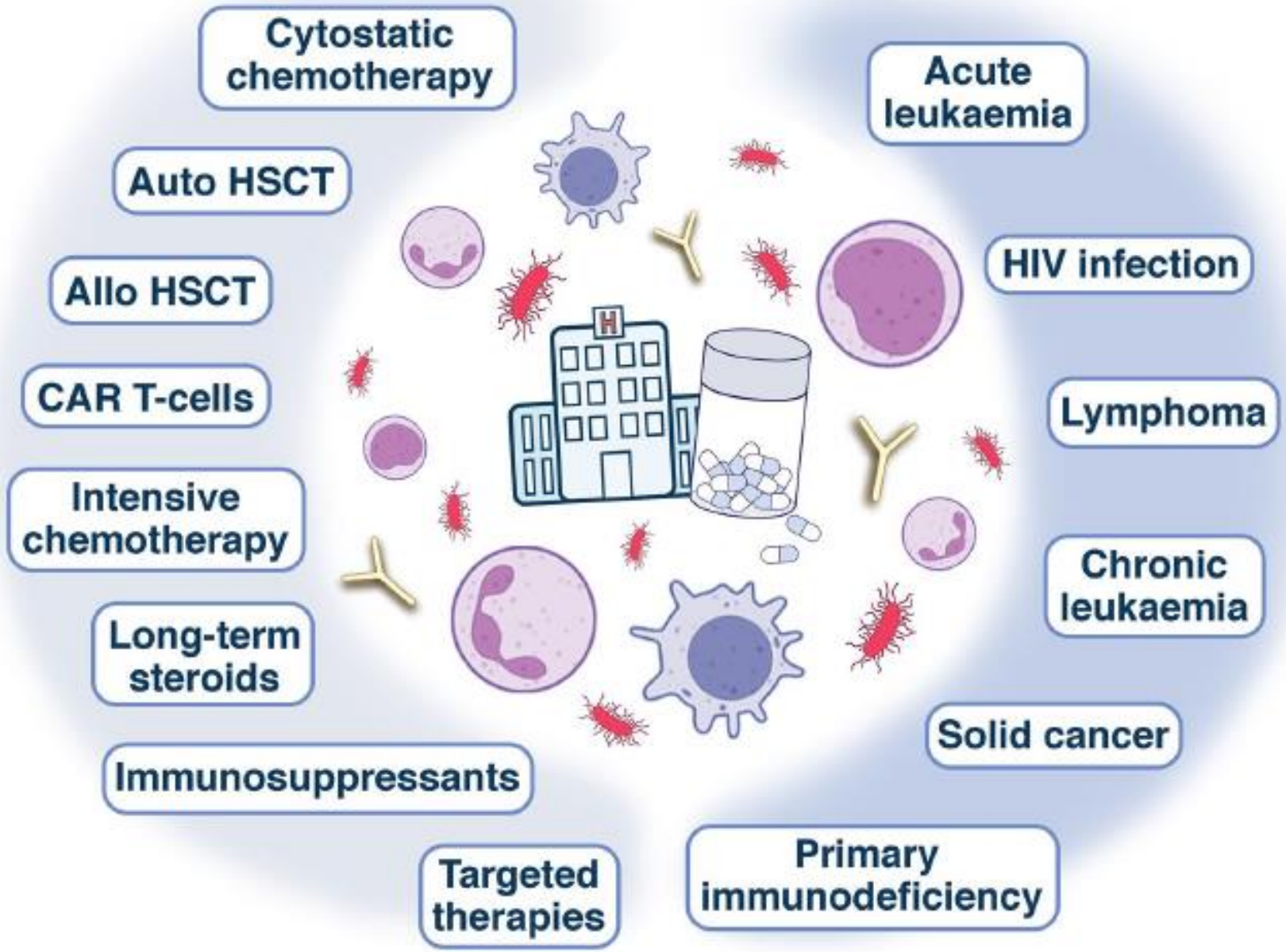
Pneumocystis



P. aeruginosa

K. pneumoniae

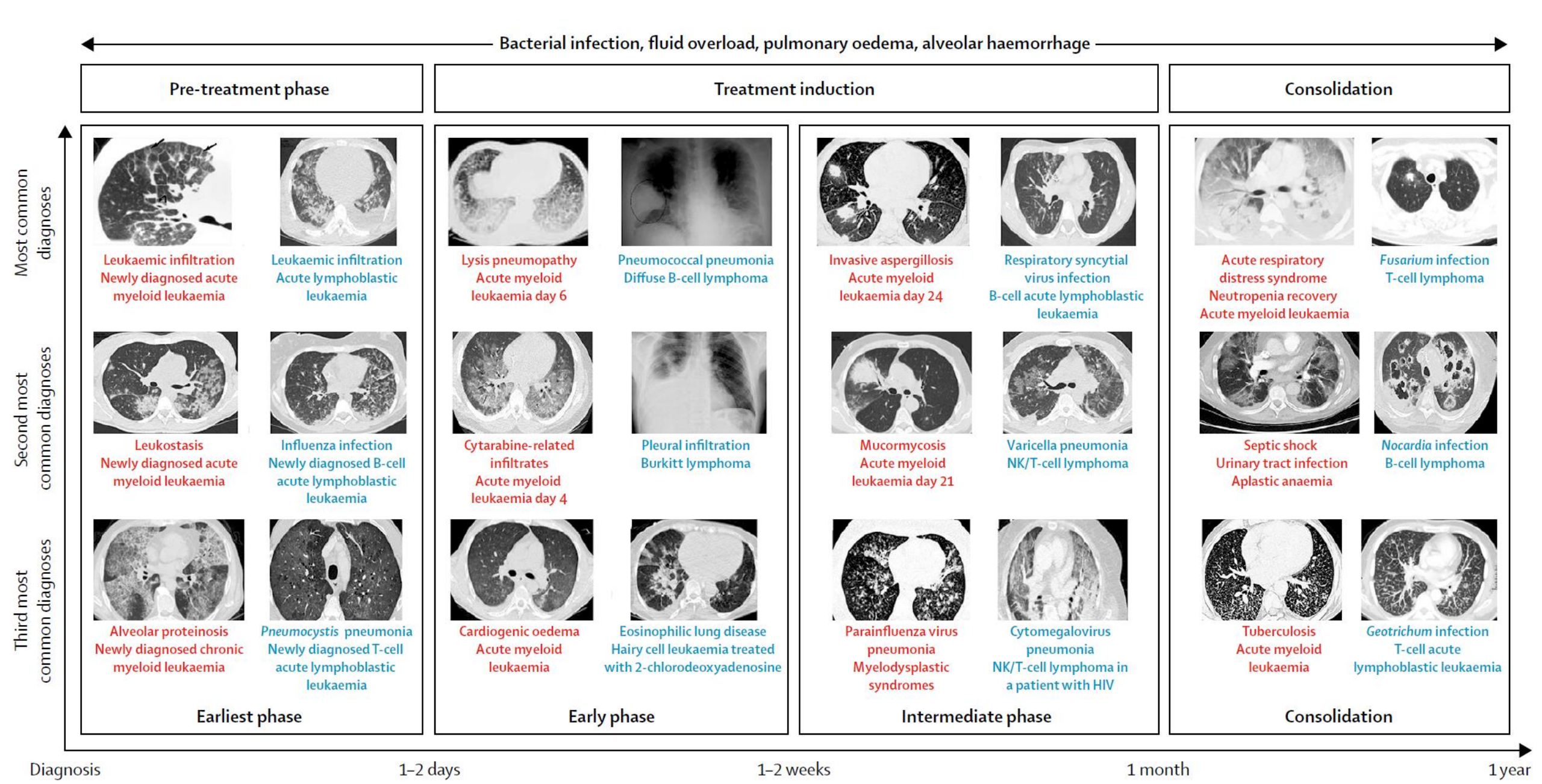




L Russell, F Pène, I Martin-Loeches, Intensive Care Med 2023

Immunological deficiency	Neutrophils 	Monocytes/dendritic cells/ macrophages 	B lymphocytes 	T lymphocytes 	Humoral (antibody) immunity 
Diseases	Acute leukaemia; myelodysplastic syndrome; aplastic anaemia; chemotherapy and drug-related neutropenia	Hairy cell leukaemia; aplastic anaemia; allogeneic bone marrow transplant; malignant histiocytosis; acute myeloid leukaemia; chronic myeloid leukaemia; solid tumours; haemophagocytic lymphohistocytosis	Multiple myeloma; B-cell lymphoma; chronic lymphocytic leukaemia	T-cell leukaemia; T-cell lymphoma; Hodgkin disease	Multiple myeloma; chronic lymphoid leukaemia
Treatments	Chemotherapy-induced neutropenia	Steroids; basiliximab; antithymocyte globulin; tacrolimus; mycophenolate mofetil; belatacept	Chemotherapy; steroids; asplenia; rituximab	Steroids; fludarabine; cyclophosphamide; methotrexate; azathioprine; alemtuzumab; mycophenolate mofetil; cyclosporine; mTOR inhibitors (sirolimus); tacrolimus; 2-chlorodeoxyadenosine; daratumumab	Ibrutinib; rituximab; daratumumab; cyclophosphamide
Most frequently encountered infections	• Gram-negative bacteria • Gram-positive bacteria • *Candida* • *Aspergillus* • *Nocardia*	• Non-tuberculous mycobacteria • *Salmonella, Listeria, Legionella, Histoplasma, Brucella* • Herpes simplex virus, varicella zoster virus, parainfluenza virus, respiratory syncytial virus • *Candida parapsilosis* • *Staphylococcus aureus, Enterococcus faecalis, Pseudomonas aeruginosa*	• Encapsulated bacteria (*Streptococcus pneumoniae, Streptococcus pyogenes, Haemophilus influenzae*) • *Giardia lamblia, Campylobacter, Salmonella* • *Mycoplasma* • Enterovirus • Recurrent infections	• Herpes simplex virus, cytomegalovirus, Epstein-Barr virus • *Pneumocystis, Aspergillus, Cryptococcus* • Mycobacterial infection • Skin candidiasis • Diarrhoea (rotaviruses, adenoviruses, *Cryptosporidium*, microsporidia, etc) • John Cunningham virus	• Encapsulated bacteria (*S pneumoniae, S pyogenes, H influenzae*) • *Mycoplasma, Ureaplasma urealyticum* • Other infections related to associated T-cell defects

***Azoulay E., Lancet Respir Med* 2019; 7: 173–86**



***Azoulay E., Lancet Respir Med* 2019; 7: 173–86**

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Diagnostic Strategy for Hematology and Oncology Patients with Acute Respiratory Failure

Randomized Controlled Trial

Azoulay and coll., Am J Respir Crit Care Med 2010

314 cancer patients admitted to the ICU with Acute Respiratory Failure (ARF)

- 49 patients intubated at admission
  11 patients refused to participate
- 34 patients with a known cause of ARF at ICU admission
  (9 with cardiac pulmonary edema)

220 patients randomized

- 1 patient withdrew consent

113 patients in the Invasive Diagnostic Strategy (early FO-BAL)

No diagnosis: N=23 (20.3%)
101 diagnoses in 90 patients
Established by FOBAL, n=18 (17.8%)
Established by noninvasive tests, n=63 (62.3)
Established by both techniques, n=20 (19.8%)

Intubation: N=41 (36.3%)
Death before day 28: N=33 (29.2%)

106 patients in the Noninvasive diagnostic strategy (no early FO-BAL)

No diagnosis: N=23 (21.7%)
93 diagnoses in 83 patients
Established by FOBAL, n=2 (2.2%)
Established by noninvasive tests, n=80 (86.1)
Established by both techniques, n=11 (11.8%)

Intubation: N=41 (38.7%)
Death before day 28: N=35 (33%)

Test/Infections

1. Imaging studies
   - Chest radiograph
   - High-resolution computed tomography
2. Echocardiography
3. Sputum examination for
   - Bacteria
   - *Candida* spp.
   - Other fungi
   - Tuberculosis
4. Induced sputum (*P. jiroveci*)
5. Nasopharyngeal aspirates
6. Blood cultures
7. Polymerase chain reaction test for
   - Herpes viridae
   - Cytomegalovirus
8. Circulating *Aspergillus* galactomanan
9. Serologic tests for
   - *Chlamydiae pneumoniae*
   - *Mycoplasma pneumoniae*
   - *Legionella pneumophila*
10. Urine antigen for
    - *Legionella pneumophila*
    - *Streptococcus pneumoniae*

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Test/Infections

1. Imaging studies
   Chest radiograph
   High-resolution computed tomography

Legionella pneumophila

10. Urine antigen for
    Legionella pneumophila
    Streptococcus pneumoniae

Multiplex Polymerase Chain Reaction Assay to Detect Nasopharyngeal Viruses in Immunocompromised Patients With Acute Respiratory Failure

CHEST

Maillard et al.,
CHEST 2023; 164(6):1364-1377

776 Patients available for analysis

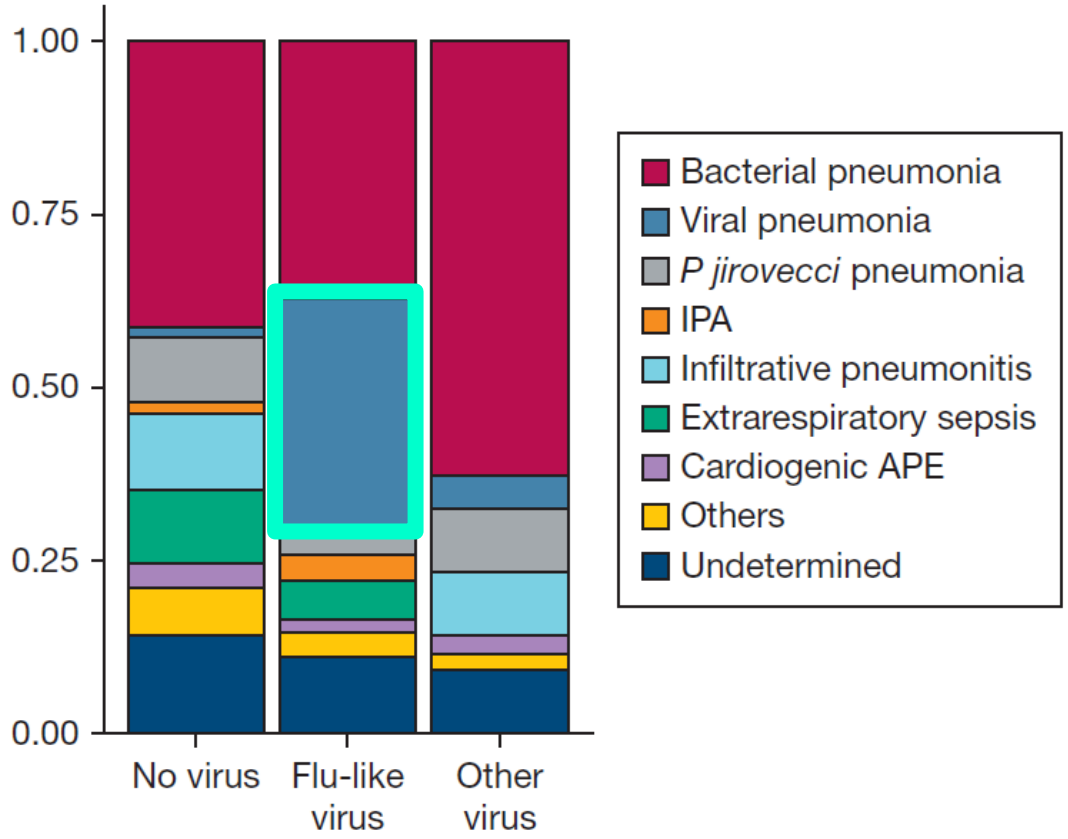
266 patients were not sampled

510 Patients sampled for multiplex PCR assay

103 Positive results

404 Negative results

Respiratory virus: 102



≈ 50%

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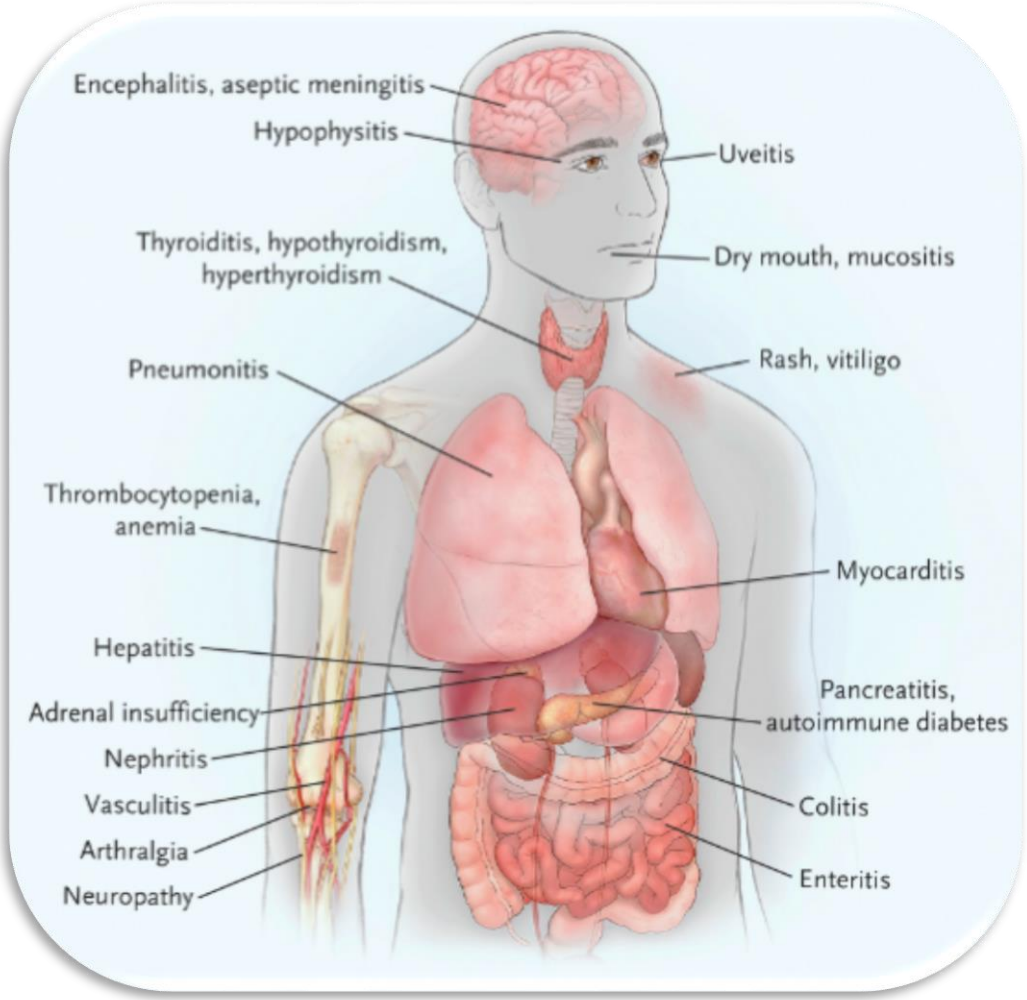
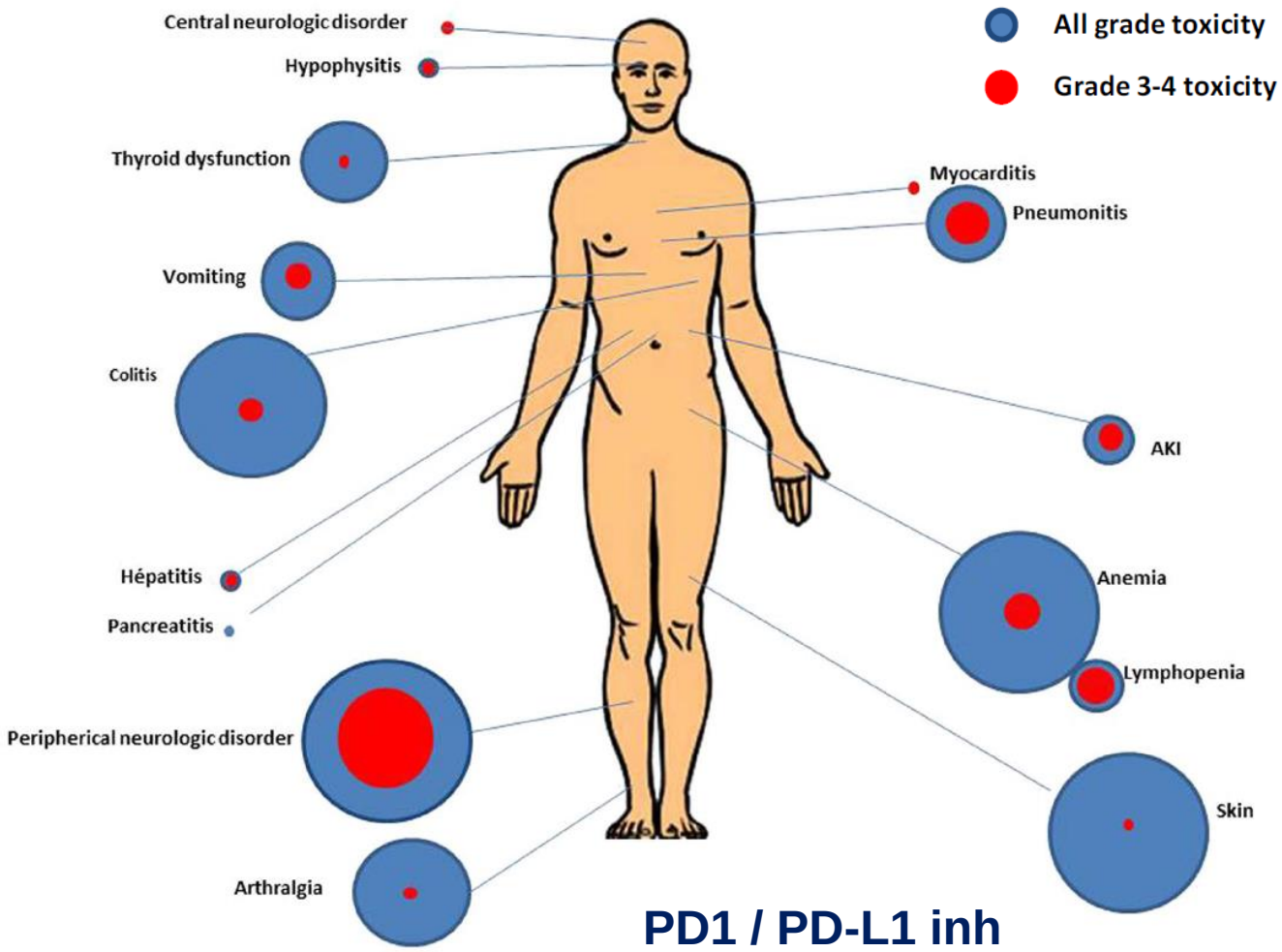
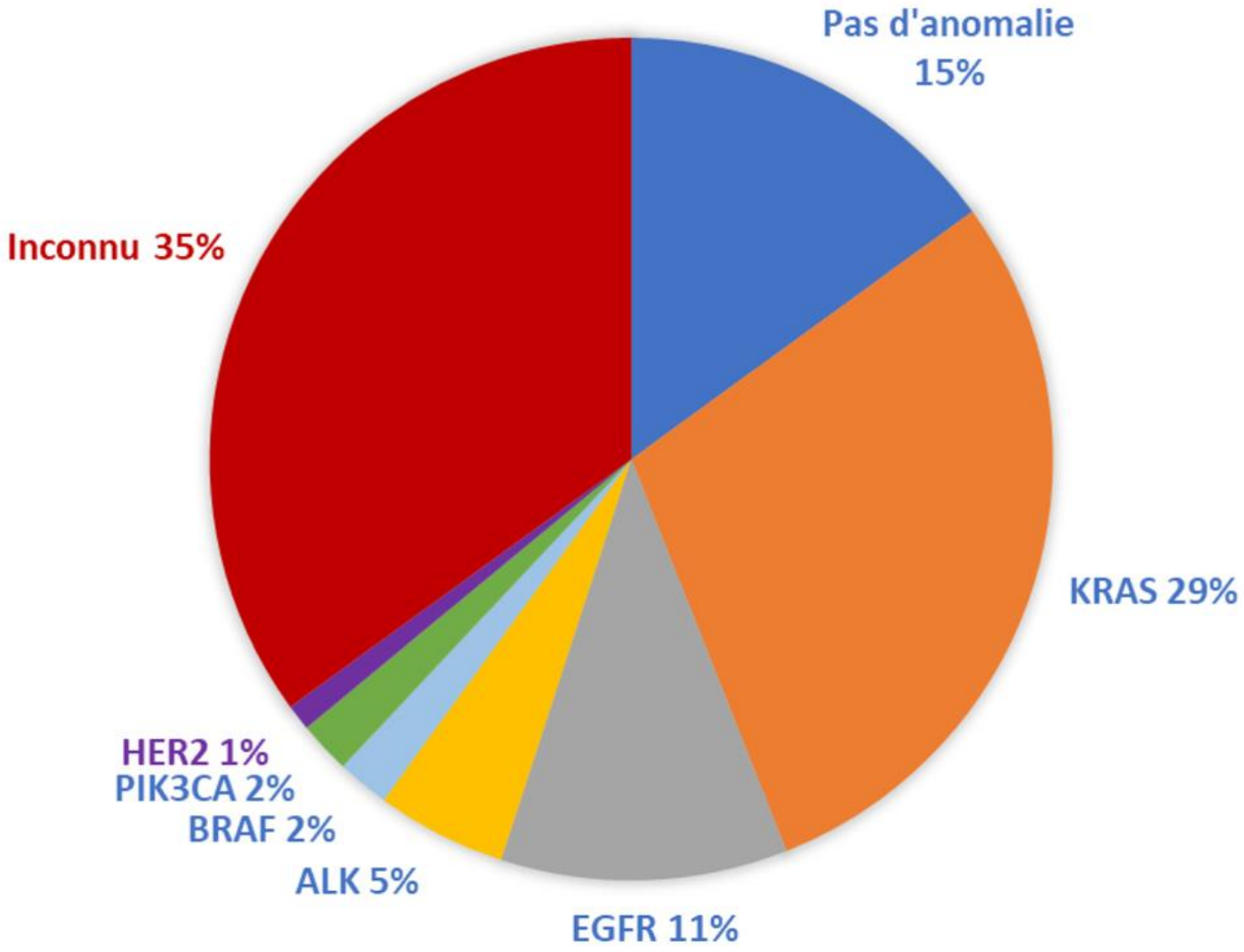
Toxicities of immune checkpoint inhibitors





Postow MA, N Engl J Med. 2018; Johnson DB, Nat Rev Clin Oncol. 2022; Lemiale V. Ann Intensive Care 2019

Carcinomes bronchiques non à petites cellules: addictions oncogéniques



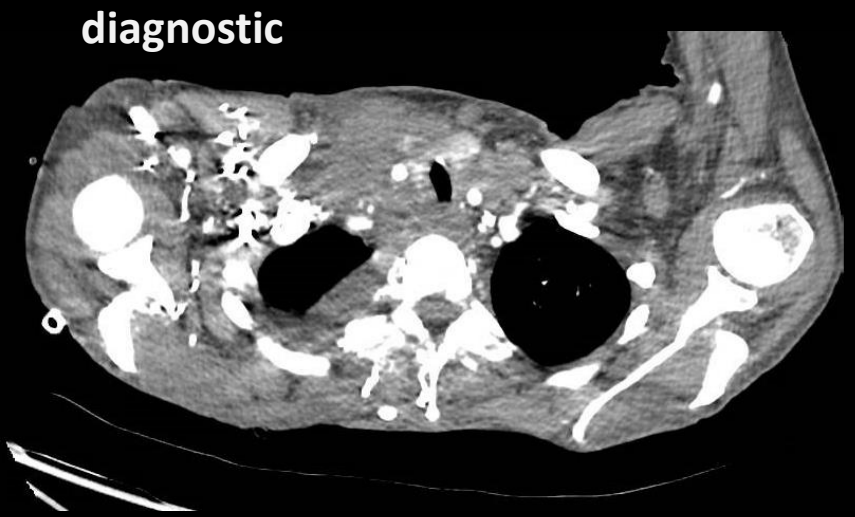
Âge jeune
Asiatique
Non-fumeur
Non épidermoïde

Biopsie liquide (ctDNA)

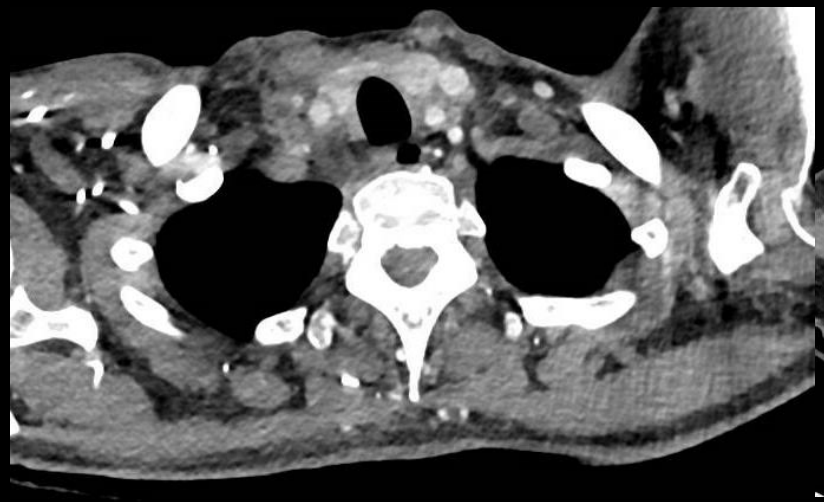
Pinsolle. MIR 2019

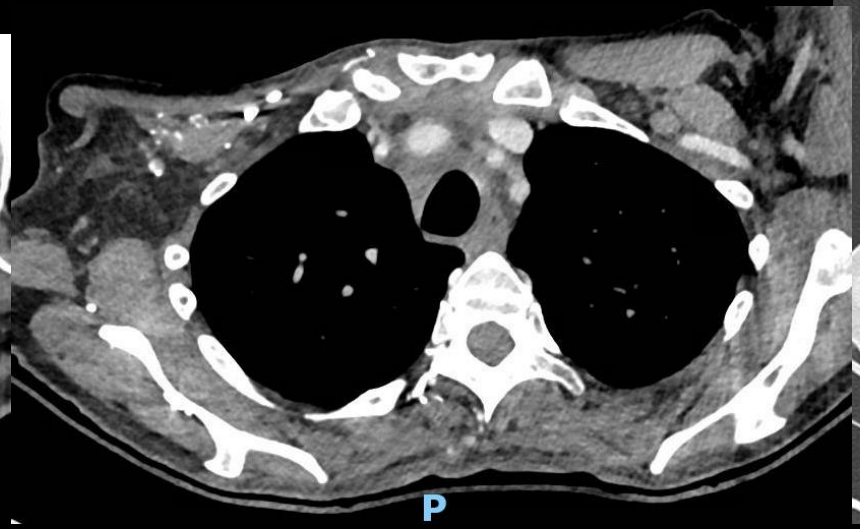
Patiente de 51 ans – adénocarcinome bronchique EGFR muté

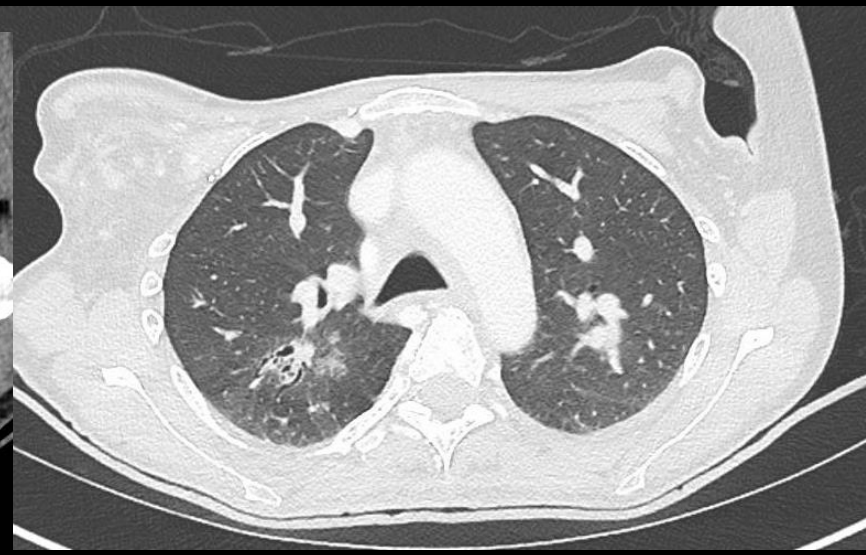
diagnostic



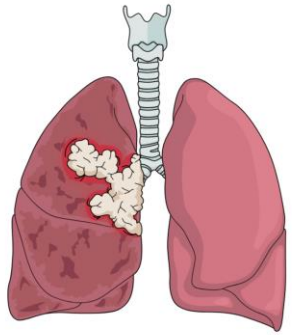
2 mois osimertinib







Inh. TK dans l'insuffisance respiratoire aiguë du NSCLC

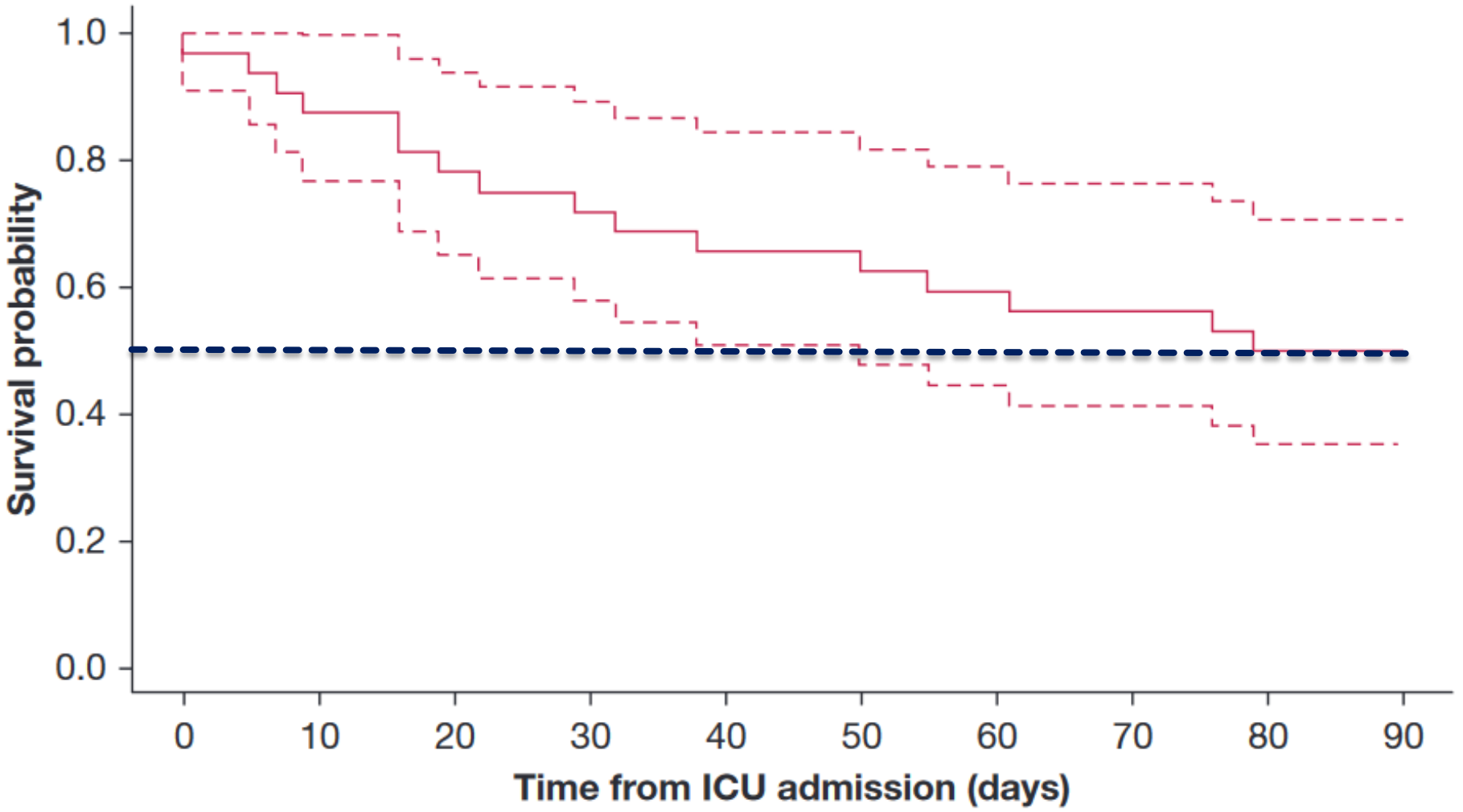


14 réanimations
2009-2019

32 patients avec
K du poumon
NSCLC (69% M+)

50% ADK
pneumoniques

53% ventilés



Y. Tandjaoui-Lambotte. Chest 2022

Insuffisance respiratoire aiguë du patient immunodéprimé

- **Indication la plus fréquente d'admission en réanimation**
- **Support ventilatoire non-invasif: au choix mais ne pas retarder le recours à l'intubation**
- **Evoquer les causes communes infectieuses et non-infectieuses**
- **La multiplicité des étiologies requiert une stratégie diagnostique systématique**
- **La fibroscopie bronchique et le LBA sont souvent dispensables en première intention**