COLLÈGE DE RÉANIMATION MÉDICALE

Insuffisance respiratoire aiguë chez les patients d'oncohématologie.

Dr Ben Ghezala Hassen

AHU Réanimation médicale.

Urgences-Réanimation

H.R.Zaghouan

Pourquoi?…

- **C'est une pathologie fréquente!**
  - **1% en oncologie Vs 10-20% en cas d'hémopathies**
  - **25% Allogreffe de moelle osseuse.**

- **C'est une pathologie mortelle!**
  - **Mortalité de près de 50%.**
  - **Le pronostic en réanimation a été amélioré à deux niveaux: l'usage de la VNI, la stratégie non invasive pour limiter la VM (mini-diagnostic stratégie…).**

- **Mortalité très élevée en absence de diagnostic étiologique…**

- **Penser toujours à un problème infectieux+++**

Plan

- Généralités.
- Pronostic des IRA en oncohématologie.
- Diagnostic positif et étiologique.
- « (Stratégie diagnostique) ».
- Ventilation mécanique (VNI).

Plan

- **Généralités.**
- **Pronostic des IRA en oncohématologie.**
- Diagnostic positif et étiologique.
- « (Stratégie diagnostique) ».
- Ventilation mécanique (VNI).

1975-1995……

editorial

Just say no

Carlon GC. *Crit Care Med.* 1989;17:106-7

Everything that *Should* Be Done—Not Everything that *Can* Be Done

Schuster D.P. *Am Rev Respir Dis* 1992;145:508-9

15 October 1996 Volume 125 Number 8

Annals of Internal Medicine

Withdrawing Life Support from Mechanically Ventilated Recipients of Bone Marrow Transplants: A Case for Evidence-Based Guidelines

Gordon D. Rubenfeld, MD, and Stephen W. Crawford, MD

Is intensive care justified for patients with haematological malignancies?

F. Brunet, J.J. Lanore, J.F. Dhainaut, F. Dreyfus, J.F. Vaxelaire, S. Nouira, T. Giraud, A. Armaganidis and J.F. Monsallier

Medical Intensive Care and Hematologic Unit of Cochin University Hospital, F-75674 Paris, France

Withdrawing Life Support from Mechanically Ventilated Recipients of Bone Marrow Transplants: A Case for Evidence-Based Guidelines

Gordon D. Rubenfeld, MD, and Stephen W. Crawford, MD

Ann Intern Med 1996.

Study, Year (Reference)	Patients Receiving Mechanical Ventilation	Patients Who Survived to Discharge from Hospital
Bellamy and Oye, 1984 (6)	10	0 (0)
Torrecilla et al., 1987 (8)	16	1 (6.2)
Crawford et al., 1988 (3)	232	16 (6.9)§
Denardo et al., 1989 (10)	41	2 (4.9)
Martin et al., 1990 (9)	24	2 (8.3)
Dees et al., 1990 (11)	8	0 (0)
Afessa et al., 1992 (12)	27	2 (7.4)
Crawford and Petersen, 1992 (7)	348	10 (2.9)§
Paz et al., 1993 (14)	28	1 (3.6)
Faber-Langendoen et al., 1993 (13)	191	6 (3.1)§
Todd et al., 1994 (15)	54	6 (11.1)
Total	979	46 (4.7)

How I treat chronic myeloid leukemia in the imatinib era

John M. Goldman

NEJM 2003

BLOOD, 15 JUNE 2007 • VOLUME 109, NUMBER 12

Dasatinib or high-dose imatinib for chronic-phase chronic myeloid leukemia after failure of first-line imatinib: a randomized phase 2 trial

Hagop Kantarjian,[1] Ricardo Pasquini,[2] Nelson Hamerschlak,[3] Philippe Rousselot,[4] Jerzy Holowiecki,[5] Saengsuree Jootar,[6] Tadeusz Robak,[7] Nina Khoroshko,[8] Tamas Masszi,[9] Aleksander Skotnicki,[10] Andrzej Hellmann,[11] Andrey Zaritsky,[12] Anatoly Golenkov,[13] Jerald Radich,[14] Timothy Hughes,[15] Athena Countouriotis,[16] and Neil Shah[17]

	Months after Randomization							
No. of Events								
Imatinib	2	7	12	18	29	41	42	42
Combination therapy	12	38	73	94	108	119	125	125
No. at Risk								
Imatinib	543	530	518	505	487	392	162	7
Combination therapy	498	442	376	334	302	255	99	7

Anti-CD20 et Lymphome B diffus:

Fischer RI. NEJM 1993, Lancet 2006.

	3-year event-free survival (95% CI)		Log-rank p
	Chemotherapy alone	Chemotherapy and rituximab	
IPI=0 and no bulk	78% (70–86)	89% (82–95)	0·054
IPI=0 and bulk	61% (48–73)	78% (68–88)	0·064
IPI=1 and no bulk	57% (46–68)	76% (67–86)	0·034
IPI=1 and bulk	44% (34–53)	74% (66–82)	<0·0001

Table 3: 3-year event-free survival by treatment group, according to prognostic factors

Outcome From Mechanical Ventilation After Autologous Peripheral Blood Stem Cell Transplantation*

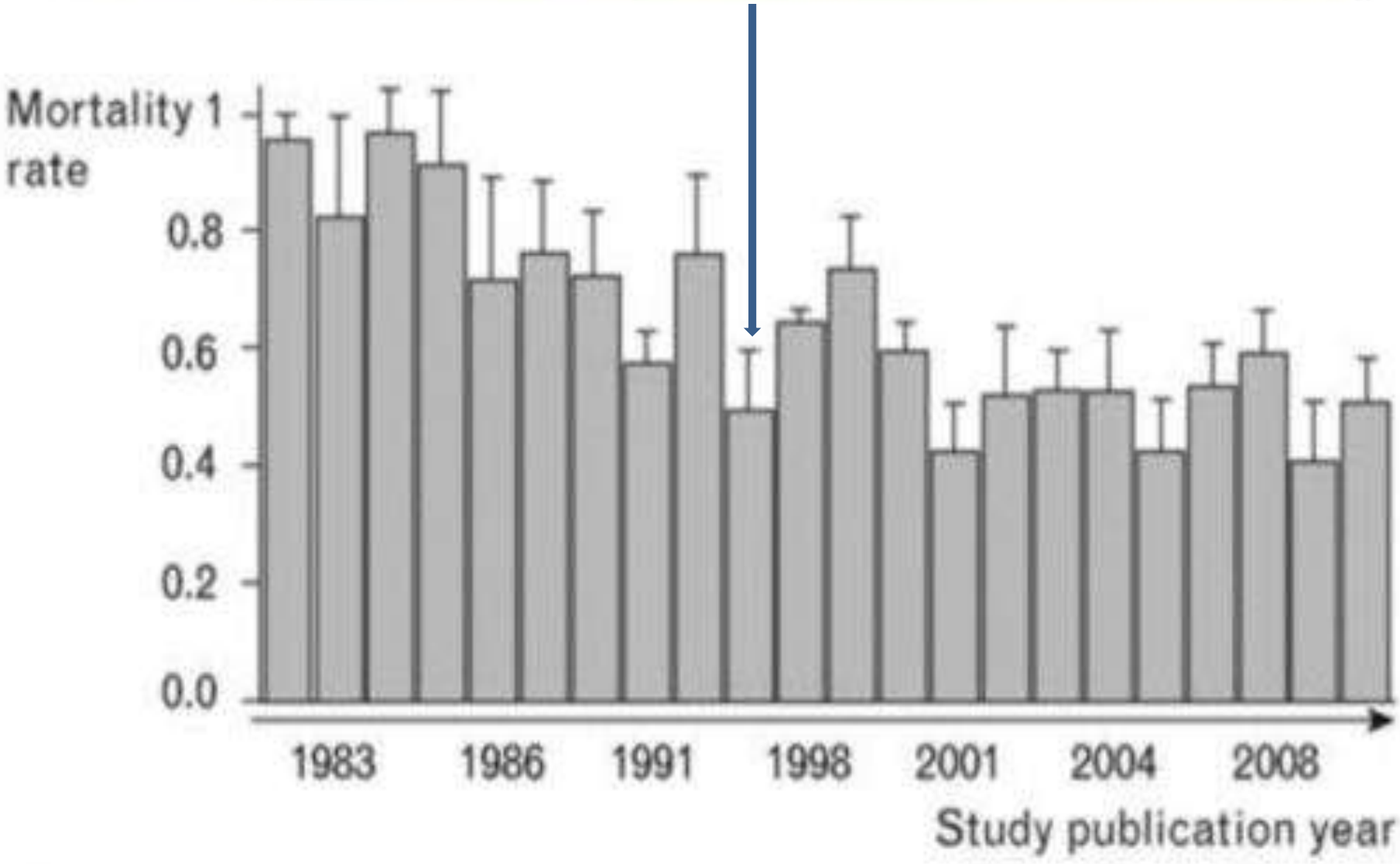
(CHEST 2002; 121:185–188)

Basheer Y. Khassawneh, MD; Peter White, Jr., MD; Elias J. Anaissie, MD, PhD; Barthel Barlogie, MD, PhD; and F. Charles Hiller, MD, FCCP

Myélome

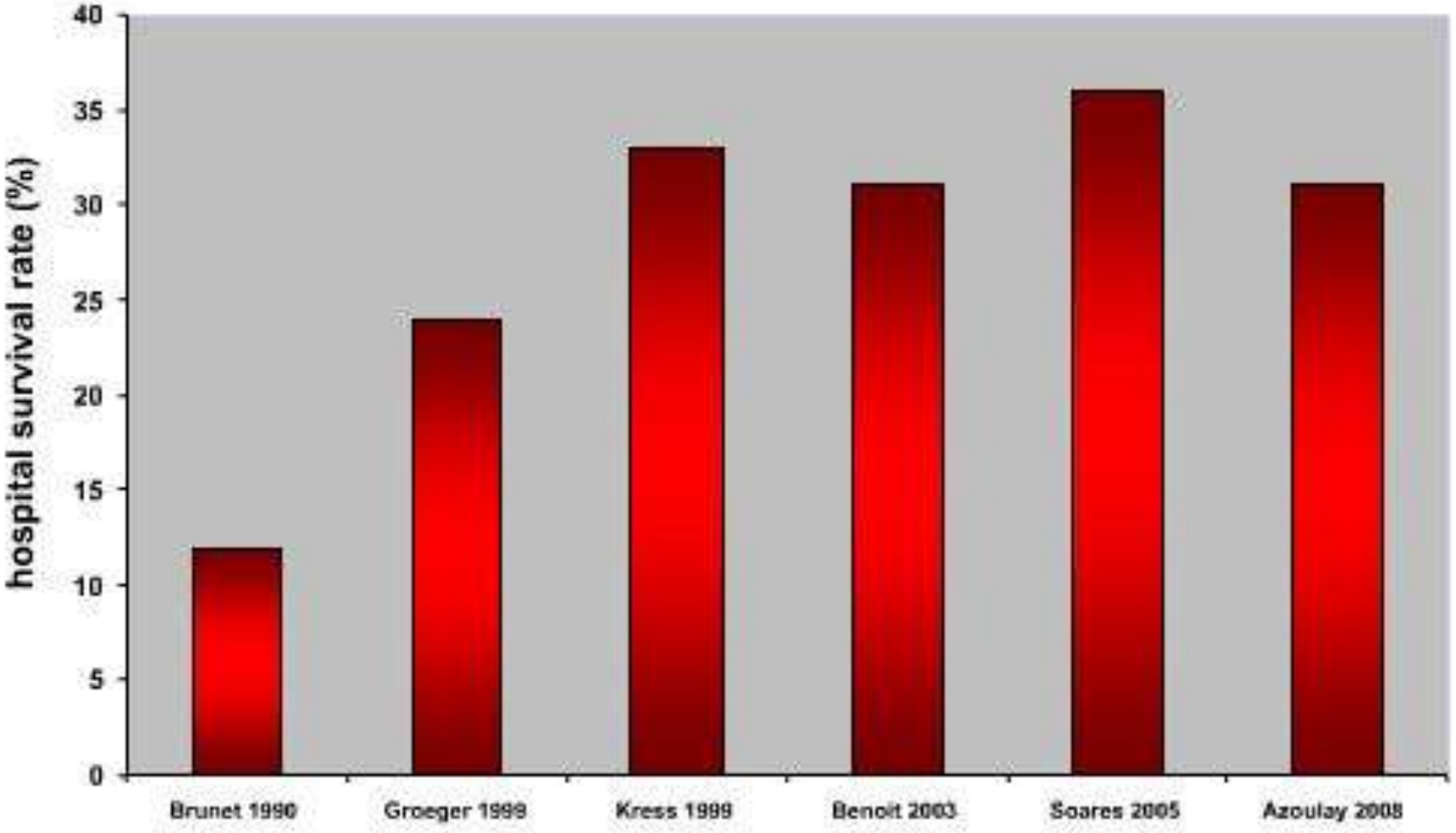
Variables	1991 - 1993	1993 - 1995	1995 - 1997	1997 - 1999
Patients	7 (9)	13 (17)	25 (33)	32 (42)
Hosp. survival	0 (0)	2 (15)	7 (27)	11 (35)
0 or 1 org failure				
Patients	7 (100)	11 (85)	18 (72)	24 (75)
Hosp. Survival	0 (0)	2 (18)	7 (39)	10 (42)
Two organ failures				
Patients	0 (0)	2 (15)	7 (28)	8 (25)
Hosp. Survival	0 (0)	0 (0)	0 (0)	1 (13)

SURVIE EN REANIMATION DES PATIENTS D'ONCO-HEMATOLOGIE



Darmon, Curr Op Oncol 2009

Pronostic VM des patients d'oncohématologie



Intensive Care Med
DOI 10.1007/s00134-006-0129-2

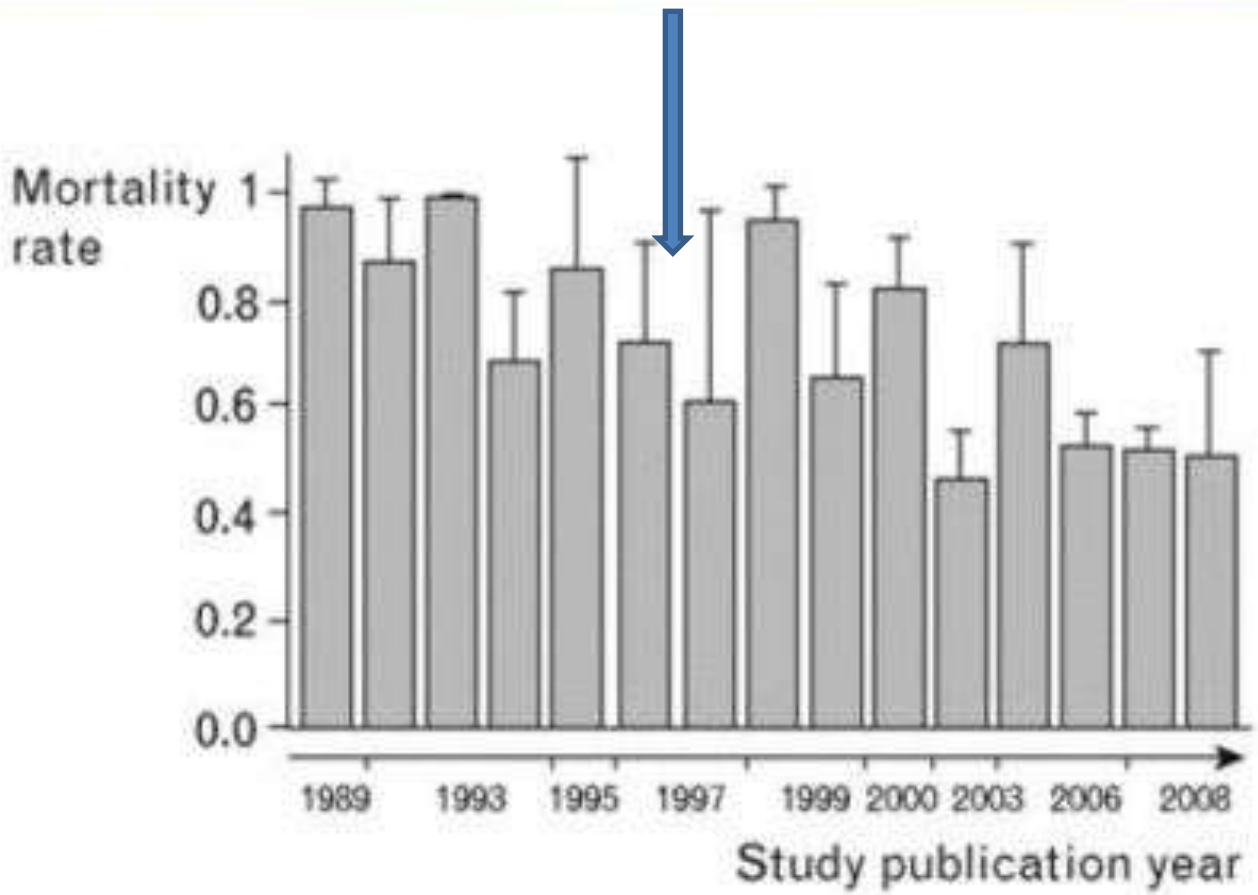
REVIEW

Élie Azoulay
Benoît Schlemmer

Diagnostic strategy in cancer patients with acute respiratory failure

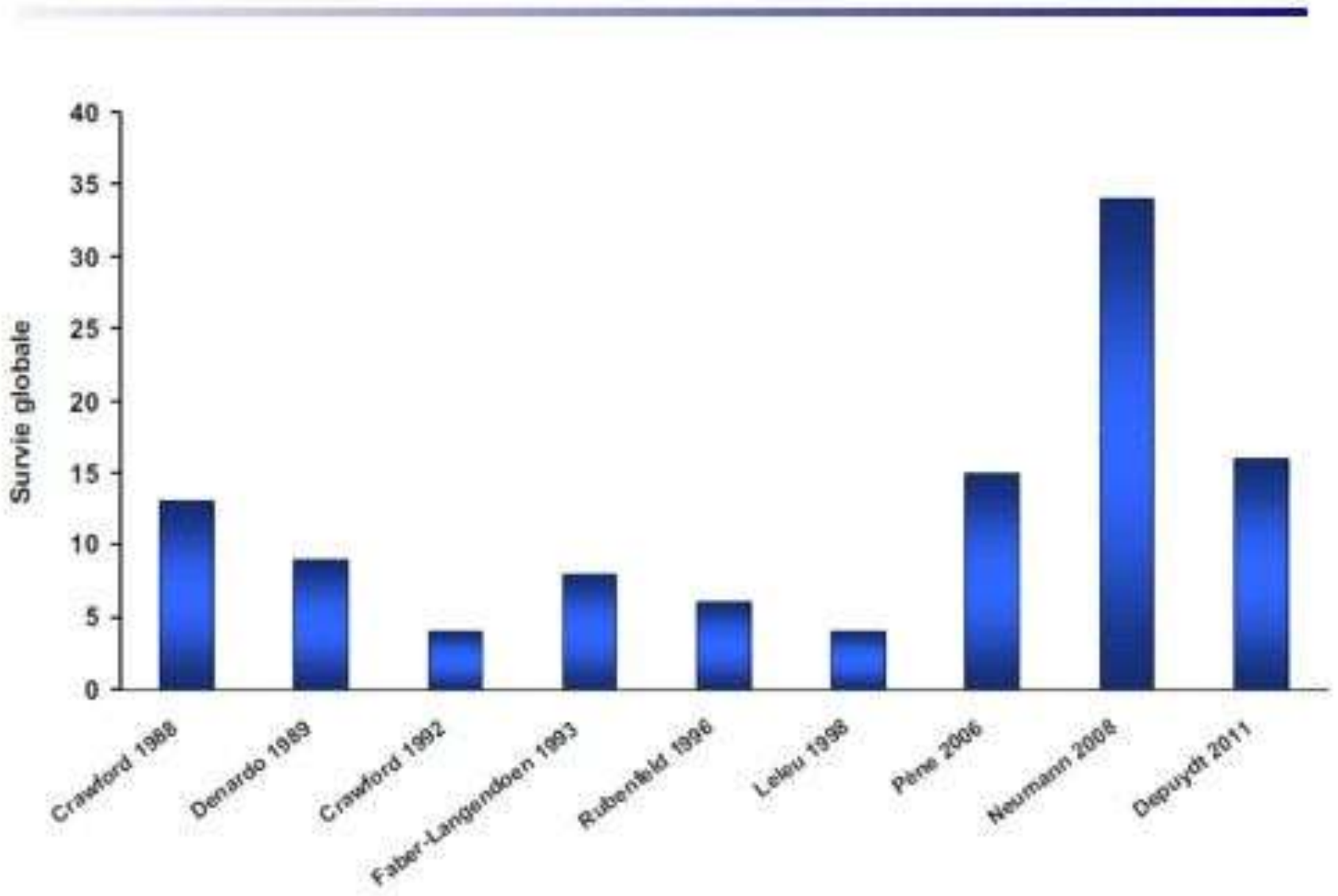
Reference	*n*	Hospital mortality
Kress et al. [23]	MV 153	67%
Azoulay et al. [104]	MV 46, NIV 9	78%
Hilbert et al. [29]	NIV 64	25%
Staudinger et al. [110]	MV 180	77%
Hilbert et al. [22]	MV 14, NIV 8	MV 93%, NIV 50%
Azoulay et al. [21]	MV 189, NIV 48	70.8%
Kassawneh et al. [116]	MV 78	75%
Darmon et al. [114]	MV 49, NIV 42	71.4%
Massion et al. [120]	MV 48	75%
Kroschinsky et al. [138]	MV 54	74%
Vallot et al. [139]	MV 168	83%
Meert et al. [113]	NIV 40	57.5%
Benoit et al. [105]	MV 87	67.8%
Larché et al. [108]	MV 68, NIV 12	79.4
Azoulay et al. [4]	MV 114, NIV 79	75%
Depuydt et al. [140]	MV 166, NIV 27	71%
Soares et al. [141]	MV 444, NIV 19	64%
Total	MV 1804, NIV 348	MV 75%, NIV 50%

Pronostic des allogreffes en réanimation



Darmon, Curr Op Oncol 2009

Pronostic VM des allogreffes en réanimation



Généralités (1)

- Les cancers solides et les hémopathies malignes sont des causes fréquentes d'immunodépression.
- Augmentation des admissions en réanimation de ces patients.
- Fin de l'époque: refus en réanimation de ces patients. Sélection.
- 1er motif de séjour en réanimation: l'insuffisance respiratoire aiguë.

Azoulay et al. Medicine 2004

Azoulay et al. CCM 2001

Hilbert et al. NEJM 2001

Quelles pathologies ?
Quels motifs d'admission?

- **Fréquentes: LAL, LAM, LMNH**
- **Moins fréquentes: LLC, LMH, MM, Sd myélodysplasiques et myéloprolifératifs.**
- **Contexte particulier allogreffe.**

- **1-Défaillance respiratoire aiguë (50%)**
- **2-Défaillance hémodynamique (25%)**
- **3-Défaillance rénale, neurologique, digestive.. SDMV…**

Azoulay et al. Medicine 2004

Critères de sélection…

E. Azoulay Rev Mal Resp 2008

- Autonomie.
- Etat général (performance status) (Karnofsky…).
- Réanimation d'attente/ Réanimation d'exception…

Intensive Care Med (2006) 32:3-5
DOI 10.1007/s00134-005-2835-6

EDITORIAL

Élie Azoulay
Bekele Afessa

The intensive care support of patients with malignancy: do everything that can be done

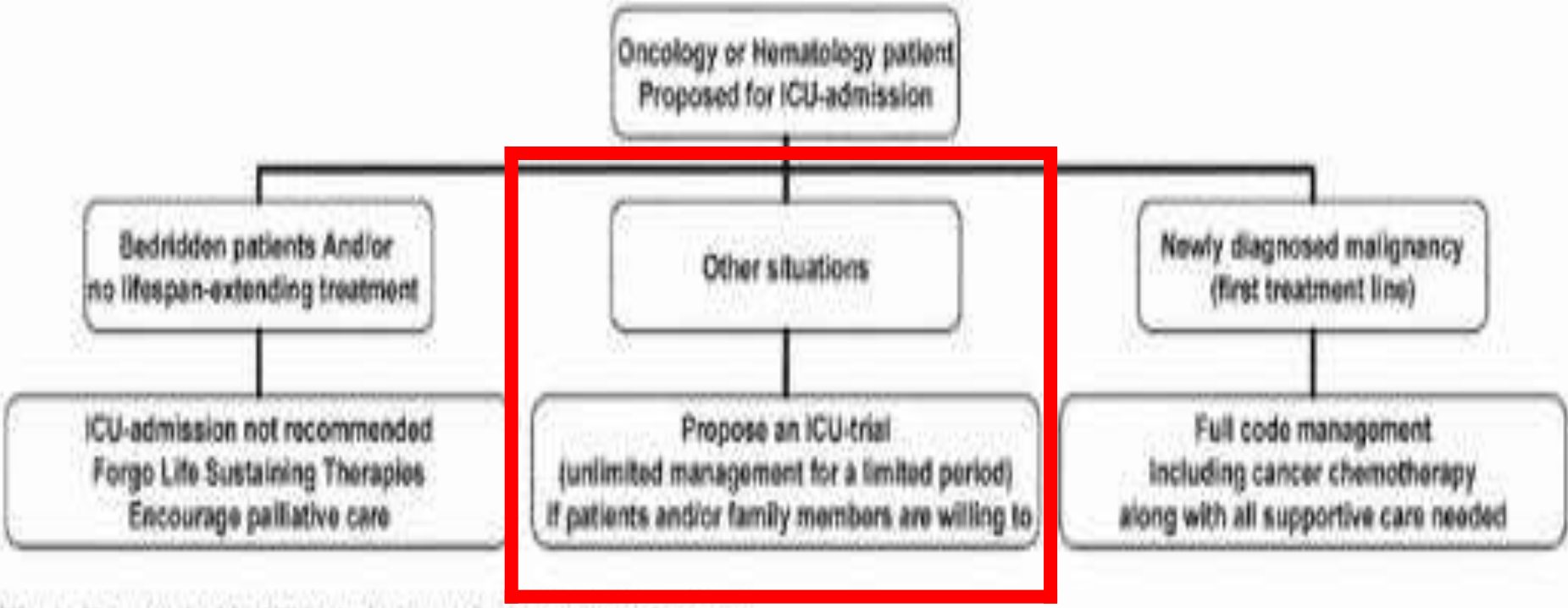
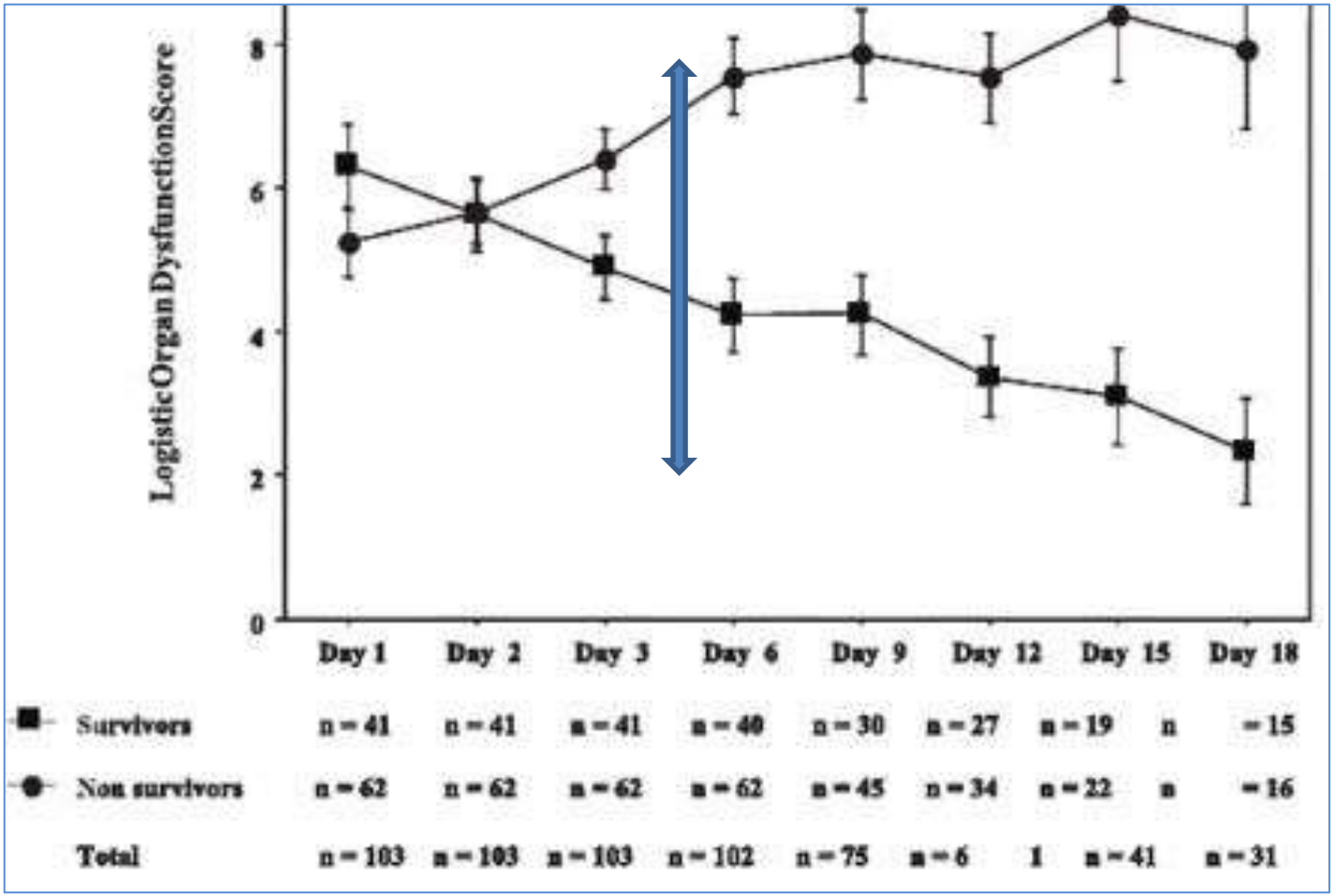


Fig. 1 How to decide ICU admission and cancer patient's status

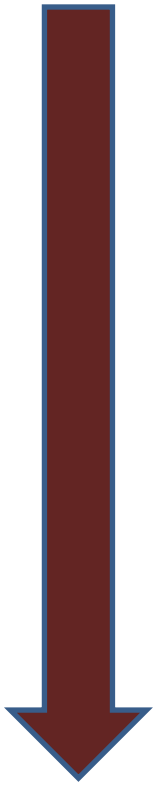
The ICU Trial: A new admission policy for cancer patients requiring mechanical ventilation*

Crit Care Med 2007 Vol. 35, No. 3

Lucien Lecuyer, MD; Sylvie Chevret, MD, PhD; Guillaume Thiery, MD; Michael Darmon, MD; Benoît Schlemmer, MD; Élie Azoulay, MD, PhD



Généralités (2): Le problème: IRA-POH



Oncologie	5%
Hématologie	10-20%
Neutropénie	40%
Greffés de moelle Allogreffe<autogreffe	50%
Mortalité	50-90%

Azoulay et al. Medicine 2004

Elie Azoulay SRLF 2013

Author	Patients	Incidence	Time	Finding	Mortality
Azoulay 2004 Medicine	All	7-12% (203/3782)	–	Undetermined diagnosis	48%
Puig. 2007 Leuk Lymphoma	Auto-BMT	15% (49/326)	J11	Myeloma Neutropenia	51% vs. 8%
Specchia 2003 Leuk Lymphoma	AL	27.7% (80/288)	/	AML>ALL No remission	Age Sortie d'aplasie
Chaoui 2004 Leukemia	AL	46% (30/65)	/	ICU admission	35% vs. 6%

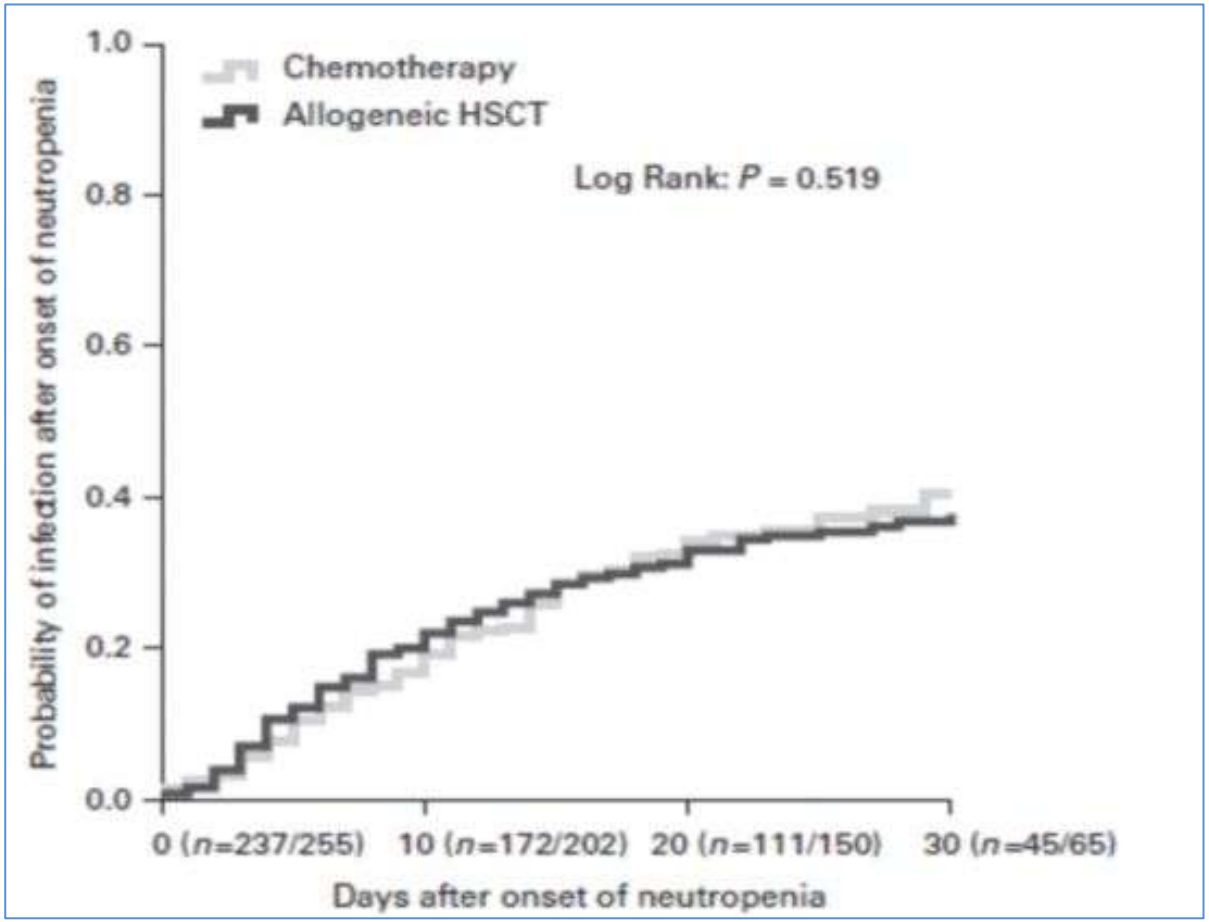
Bone Marrow Transplantation (2010) 45, 521–526

www.nature.com/bmt

ORIGINAL ARTICLE

Comparison of infectious complications during induction/consolidation chemotherapy versus allogeneic hematopoietic stem cell transplantation

C Orasch[1,3], M Weisser[1,3], D Mertz[1], A Conen[1], D Heim[2], S Christen[2], A Gratwohl[2], M Battegay[1], A Widmer[1] and U Flückiger[1]



10-15/1000 jours de neutropénie!

The Prognosis of Acute Respiratory Failure in Critically Ill Cancer Patients

Élie Azoulay, MD, PhD, Guillaume Thiéry, MD, Sylvie Chevret, MD, PhD, Delphine Moreau, MD, Michaël Darmon, MD, Anne Bergeron, MD, PhD, Kun Yang, MD, Véronique Meignin, MD, Magali Ciroldi, MD, Jean-Roger Le Gall, MD, Abdellatif Tazi, MD, PhD, and Benoît Schlemmer, MD

(*Medicine* 2004;83:360–370)

Hôpital	Réanimation	Mortalité H
100 LMC	12 (12)	3 (25)
520 LA	62 (12)	30 (49)
262 Myélome	27 (10.3)	15 (55)
600 Lymphome	48 (8)	21 (44)
150 LLC	11 (7.3)	6 (55)
200 Hodgkin	12 (6)	5 (42)
200 Divers hémato	12 (6)	6 (50)
500 KBP	10 (2)	6 (60)
1250 Sein	9 (0.7)	5 (55)
3782 patients	203 (5.4%)	97 (47.7%)

Conclusion 1

- Amélioration du pronostic des patients en OH.

(TTT, Défaillance d'organe, VNI….).

- Sélection et notion de réanimation d'attente.

- IRA= 1ère cause d'admission en réanimation des POH.

- Incidence variable (5-50%), mortalité de 50%.

Plan

- Généralités.
- Pronostic des IRA en oncohématologie.
- **Diagnostic positif et étiologique.**
- « (Stratégie diagnostique) ».
- Ventilation mécanique (VNI).

Définition clinique de l'IRA en oncohématologie selon:

Azoulay et al. Rev Mal Respir 2008

- **Clinique:**

➢ Tachypnée.

➢ Mise en jeu des muscles respiratoires accessoires, épuisement respiratoire.

➢ SaO2 AA < 90%.

➢ Nécessité d'O2 à fort débit ou de ventilation mécanique VI ou VNI.

Azoulay et al. Rev Mal Respir 2008

Tableau I.
Causes d'insuffisance respiratoire aiguë chez les patients souffrant de pathologies malignes.

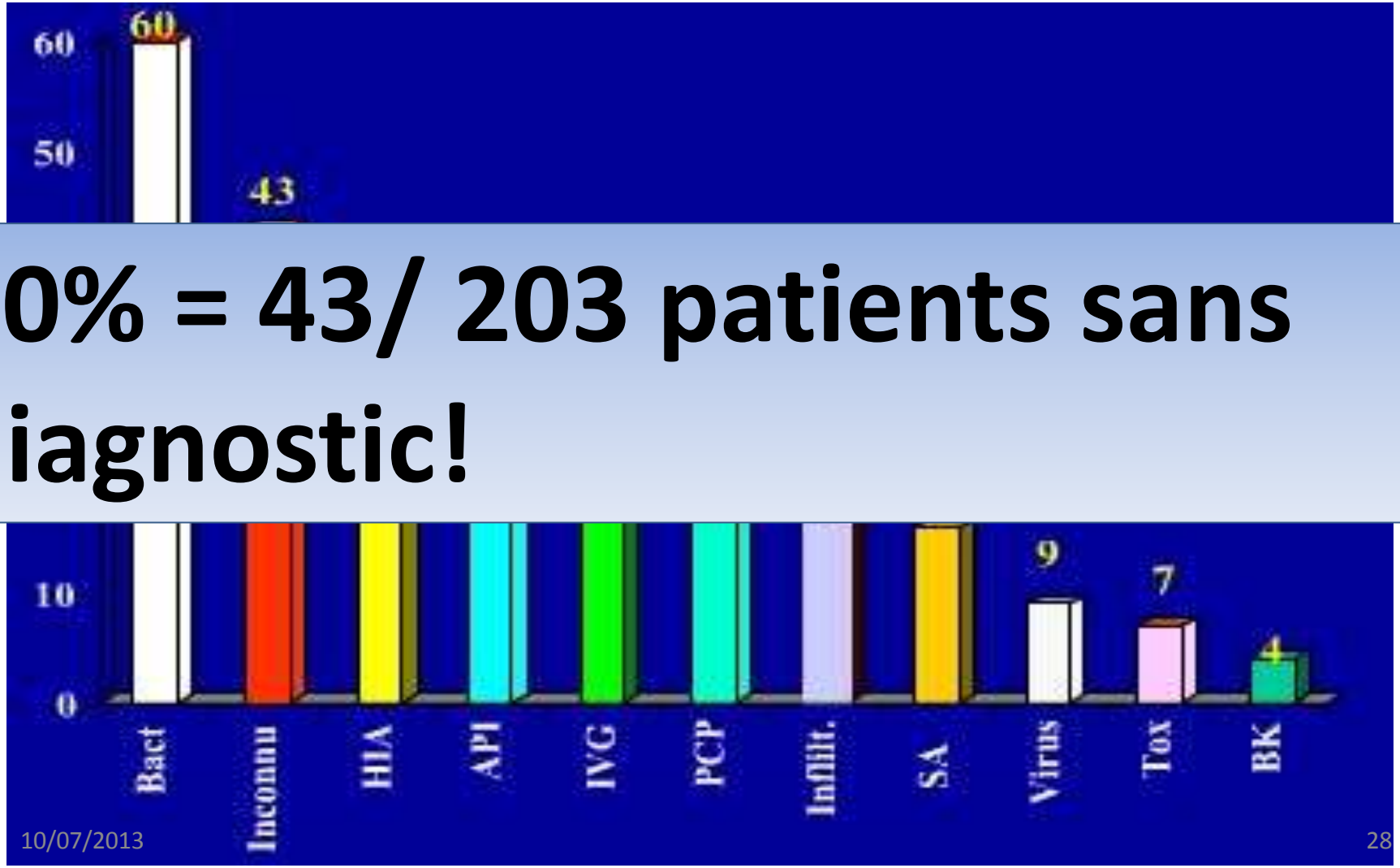
Causes infectieuses	Causes non infectieuses
Infections bactériennes • Bactéries pyogènes – Streptococcus pneumoniae – Staphylococcus aureus – Haemophilus influenzae – Pseudomonas aeruginosa et Enterobactéries • Bactéries intracellulaires – Legionella pneumophilia – Chlamydia et Mycoplasma pneumoniae	Œdème pulmonaire cardiogénique Syndrome de fuite capillaire Infiltration pulmonaire spécifique Toxicité médicamenteuse Hémorragie alvéolaire
Anguillulose	Dommage alvéolaire diffus
Infections fongiques invasives • Champignons filamenteux – Aspergillus – Champignons émergents : – Trichosporose, Fusariose, Zygomycètes • Levures – Atteinte pulmonaire des candidémies • Infections fongiques endémiques – Histoplasmose, coccidioidomycose, – Blastomycose	Bronchiolite Bronchiolite oblitérante avec pneumonie organisée Second cancer
Infections virales (primo-infections ou réactivations) • Virus respiratoires saisonniers – Influenzae, parainfluenzae, rhinovirus – Virus respiratoire syncytial • Herpes virus – CMV, HSH, VZV, HHV6 • Autres virus : adénovirus	
Infections mycobactériennes • Tuberculose et mycobactéries atypiques	

Causes infectieuses+++

The Prognosis of Acute Respiratory Failure in Critically Ill Cancer Patients

Élie Azoulay, MD, PhD, Guillaume Thiéry, MD, Sylvie Chevret, MD, PhD, Delphine Moreau, MD, Michaël Darmon, MD, Anne Bergeron, MD, PhD, Kun Yang, MD, Véronique Meignin, MD, Magali Ciroldi, MD, Jean-Roger Le Gall, MD, Abdellatif Tazi, MD, PhD, and Benoît Schlemmer, MD

(*Medicine* 2004;83:360–370)



20% = 43/ 203 patients sans diagnostic!

Azoulay et al. Medicine 2004.

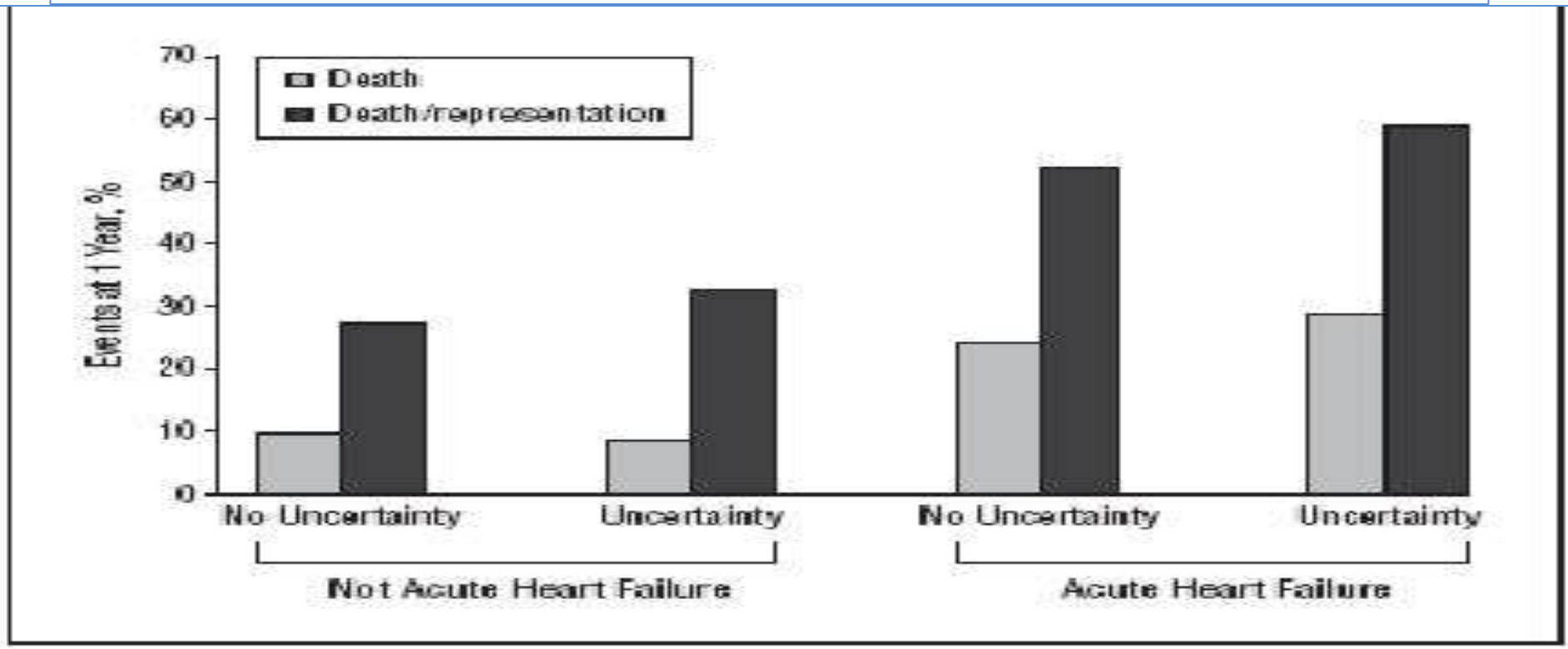
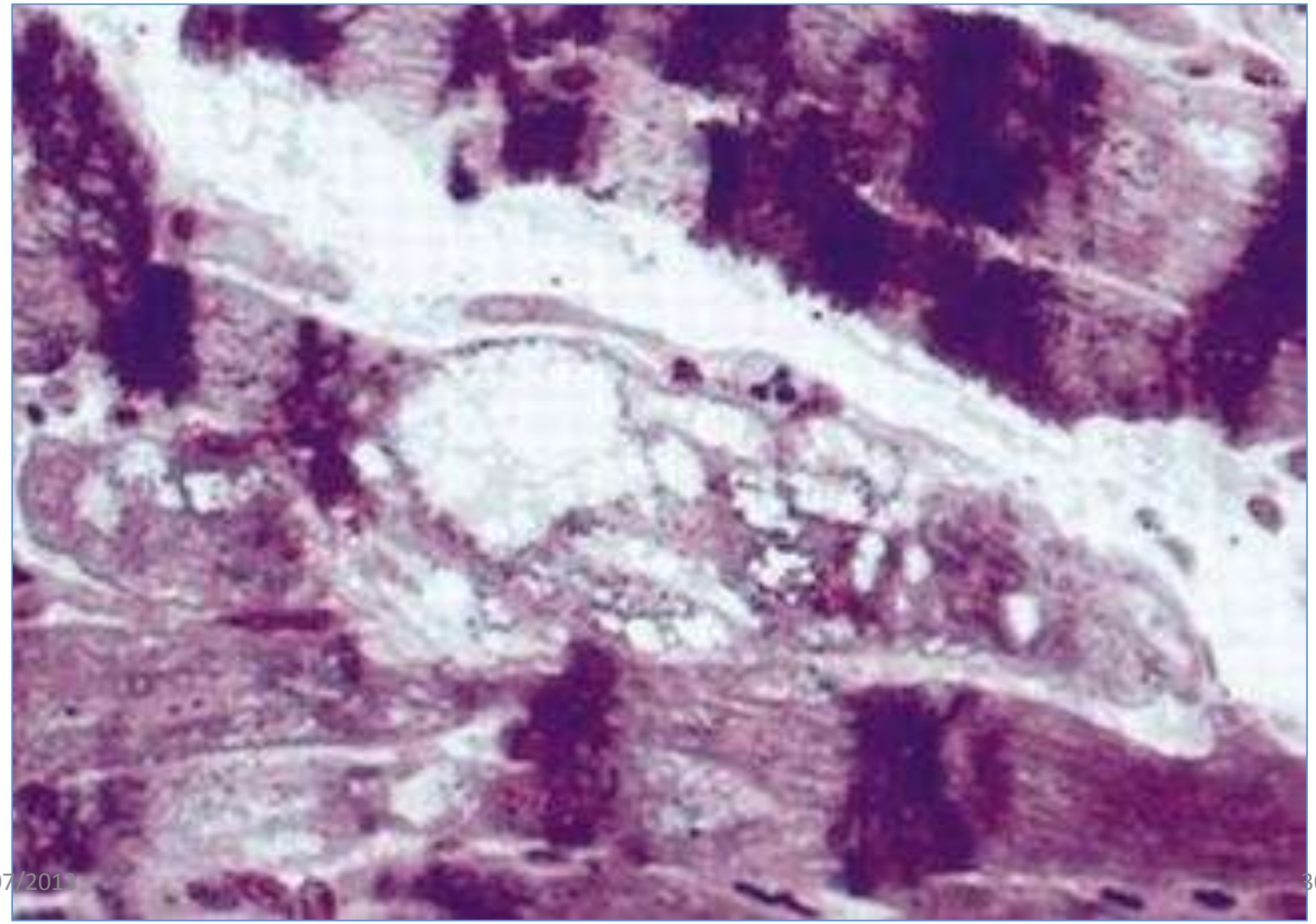


Figure 3. Associations between clinical certainty and 1-year rates of death and death/representation as a function of diagnosis at presentation.

Stover Annals 1984 Masur JAMA 1985 Shelhamer Annals 1992 Pisani Mayo Clin Proc 1992 Von Eiff, Eur J Hematol 1995 / Ann Hematol 1995 Hilbert CCM 2000 Hilbert NEJM 2001Gruson CCM 2000

Doxorubicin-Induced Cardiomyopathy

Pawan K. Singal, D.Sc., and Natasha Iliskovic, M.D.



1ère étape: éliminer l'OAP cardiogénique!

- C'est là où on a un meilleur pronostic!
- Le patient (ATCDS, prise d'anthracyclines)….
- Signes cliniques et radiologiques d'OAP….
- ETT, BNP si normal….

Stratégie diagnostique.

E.Azoulay DURPI 2011

- Analyser le dossier……
- Réanimer le patient……..
- Formaliser le diagnostic… (pré-test…),

  faire le bon examen!

Causes probables sur 100 IRA….

« tous les malades ne peuvent pas avoir tous »

E.Azoulay DURPI 2011

Aspergillose invasive	**10%**
Pneumocystose	10%
Surcharge cardiaque - hyperperméabilité	10-75%

Causes infectieuses+++

Hémopathies myéloïdes= neutropénie.
Hémopathies lymphoïdes = ID profonde.
Allogreffe Moelle= risque G-Hôte= aspergillaire et opportunistes…

1

DIRECT APPROCHE D

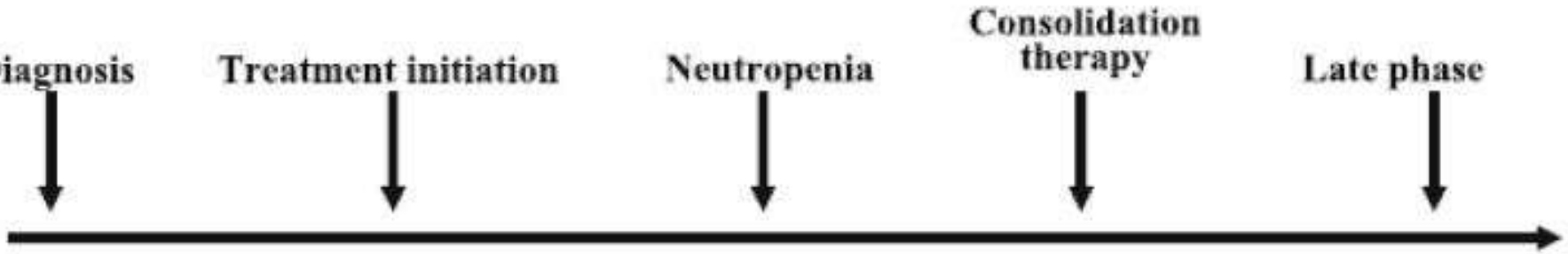
Intensive Care Med
DOI 10.1007/s00134-006-0129-2

REVIEW

Élie Azoulay
Benoît Schlemmer

Diagnostic strategy in cancer patients with acute respiratory failure

AH: alveolar hemorrhage



Diagnosis	Treatment initiation	Neutropenia	Consolidation therapy	Late phase
Infiltration/Lysis	Lysis syndrome Capillary leak syndrome	Severe sepsis	Toxicity	Infiltration Second cancer Toxicity
AH	AH	AH	AH	AH
Overload	Overload	Overload	Overload	Overload
Infections	Infections	Infections	Infections	Infections

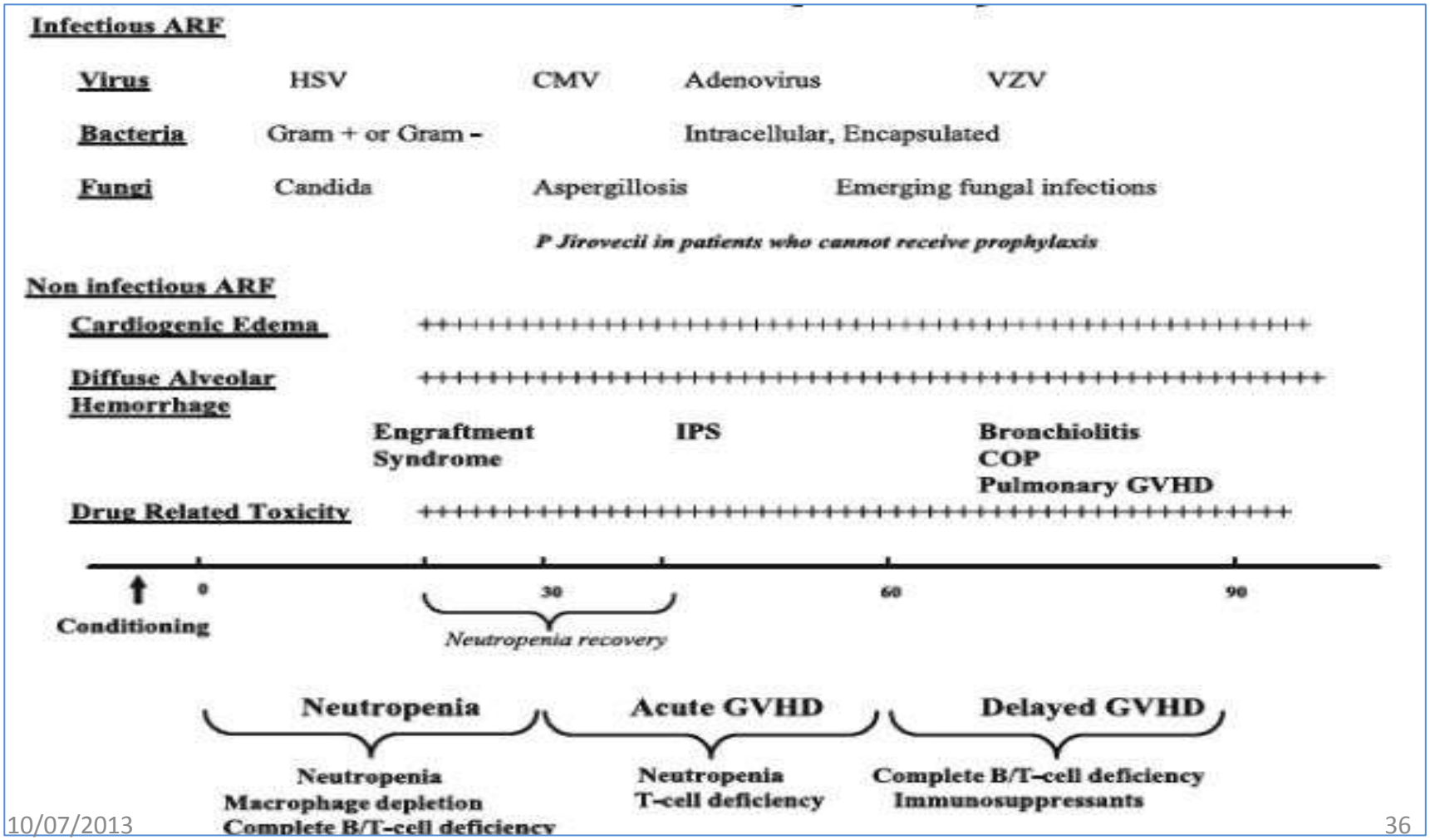
Intensive Care Med
DOI 10.1007/s00134-006-0129-2

REVIEW

Chez le patient allogreffé!

Élie Azoulay
Benoît Schlemmer

Diagnostic strategy in cancer patients with acute respiratory failure



2

DIRECT APPROCHE I

Azoulay et al. Rev Mal Respir 2008

Tableau II.
Nature du déficit immunitaire et infections associées.

Diagnostic	Déficits	Infections
LAM	Phagocytose Immunité cellulaire	Bactéries Champignons
LAL	Phagocytose Immunité cellulaire	Bactéries Champignons Virus du groupe Herpes *P. jirovecii*
Lymphome	Immunité cellulaire	*P. jirovecii* Champignons Bactéries, bactéries encapsulées
Myélome	Immunité humorale	Bactéries encapsulées
LLC	Phagocytose Immunité cellulaire	Bactéries encapsulées Bactéries intracellulaires Virus du groupe Herpes
LMC	Phagocytose	Bactéries
Cancer solide	Compression, obstruction, ulcération	Bactéries
Allogreffe de moelle	Phagocytose Immunité cellulaire Immunité humorale	Bactéries Bactéries encapsulées Champignons *P. jirovecii*
	L'asplénie est en général associée à une altération de l'immunité humorale, de la phagocytose et de l'immunité cellulaire	Bactéries encapsulées

LAM : leucémie aiguë myéloblastique ; LAL : leucémie aiguë lymphoblastique ; LLC : leucémie lymphoïde chronique ; LMC : leucémie myéloïde chronique.

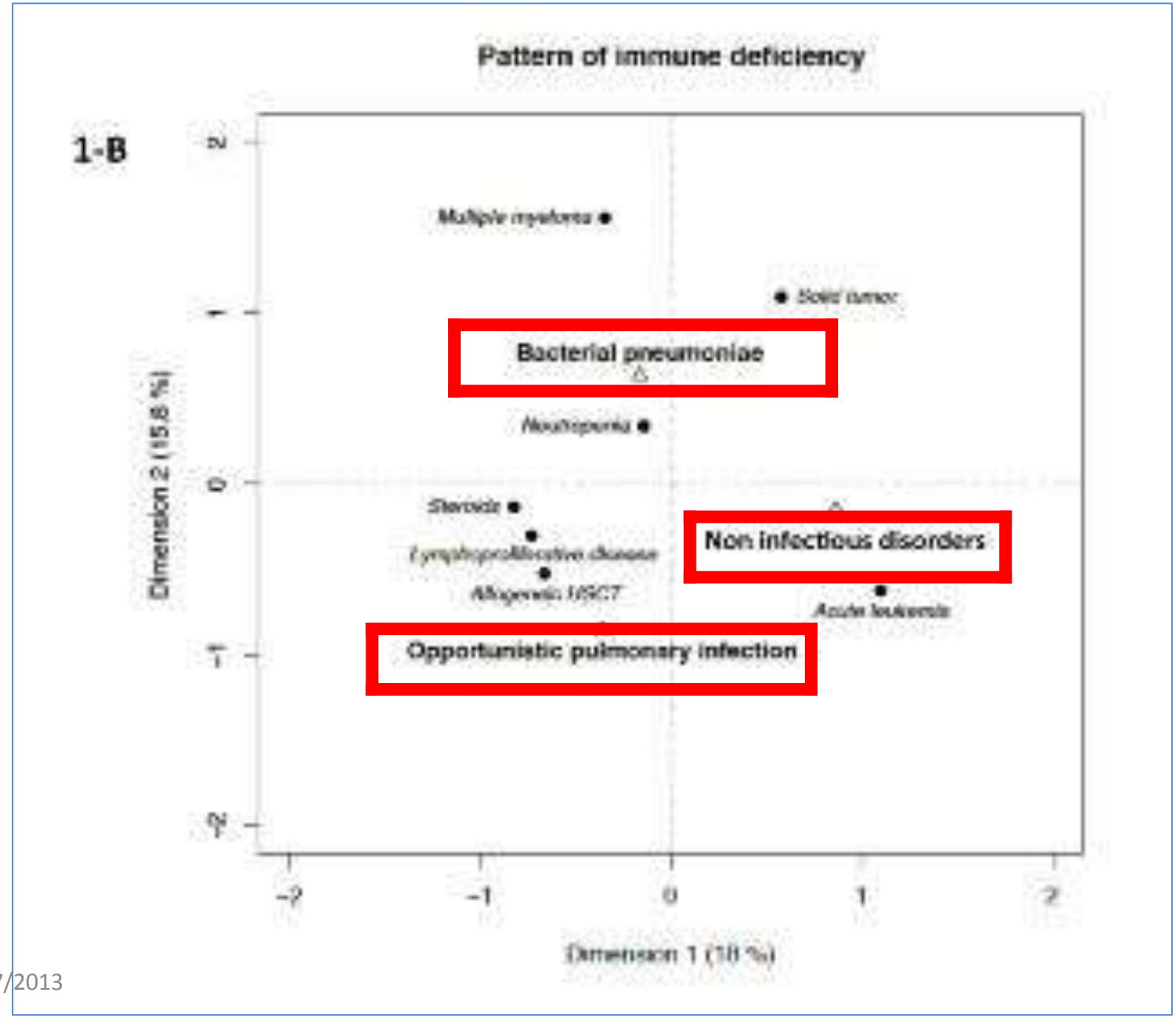
Infections in Patients with Multiple Myeloma in the Era of High-Dose Therapy and Novel Agents

Marcio Nucci[1] and Elias Anaissie[2]

[1]University Hospital, Universidade Federal do Rio de Janeiro, Brazil; and [2]University of Arkansas for Medical Sciences, Little Rock, Arkansas

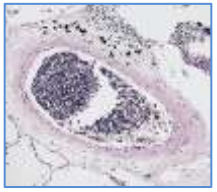
Myélome	Hypogamma	Bact encapsulées
Myélome et CA	Neutrophiles	Bactéries
I. Rénale	Fonction PN	Bact + virus
Stéroïdes	Fonction PN, glyc émie	Toute infection
Thalidomide	Stimulation T cels et NK	MVTE
Bortezomib	T and dendritic cells	HSV, VZV
Lenalidomide	?	Bactéries
Greffe	…	…
Surcharge ferrique	Altération de toutes cell	Toute infection

Schnell D. et al. ERJ 2012.



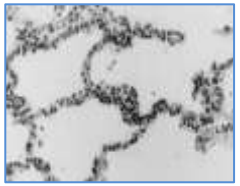
Vincent F., Rev Mal Resp 2013

- **Leucostase quantitative hyperleucocytaire.**



Chimiothérapie++++VNI.

- **Infiltration pulmonaire leucémique qualitative (blastes-endothélium). Secteurs lymphatiques et veineux, Paroi septales..**



Dexaméthasone++++, chimiothérapie, VNI.

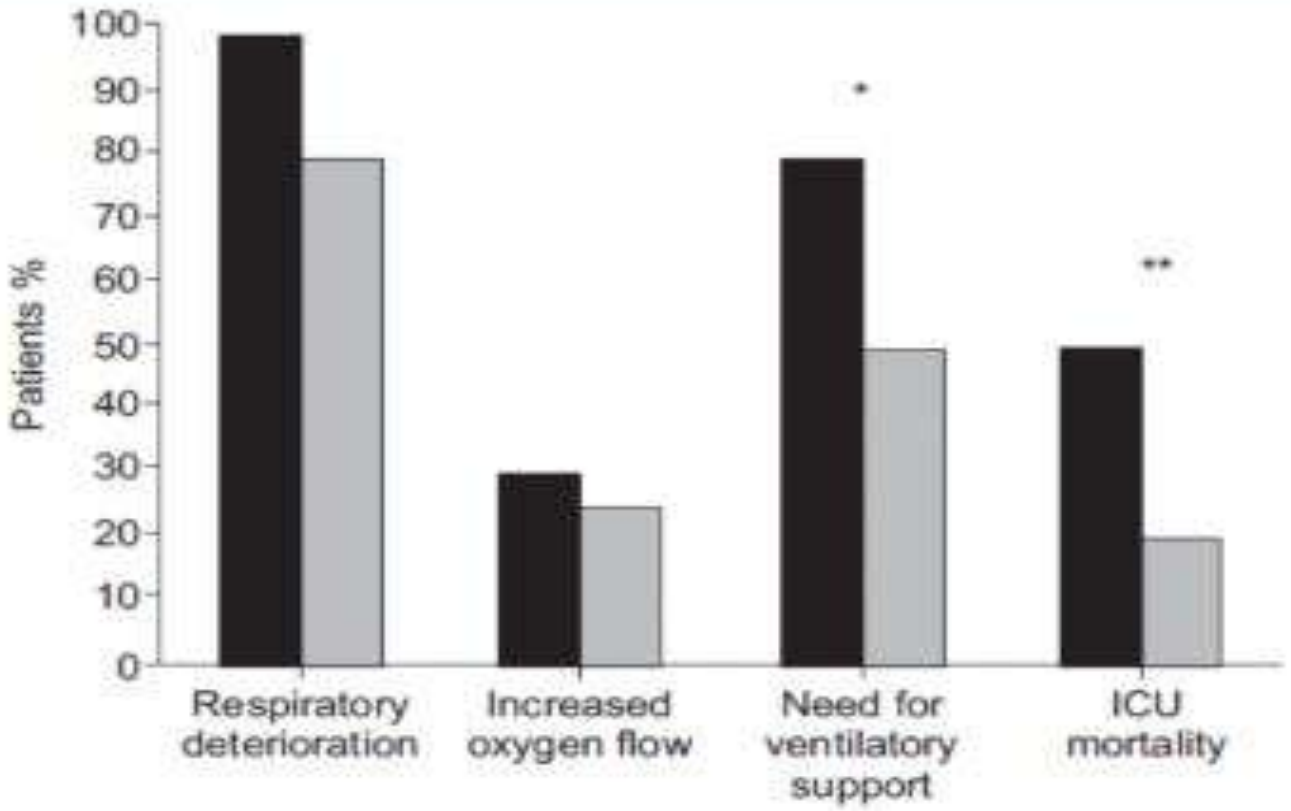
- **Lyse pulmonaire: dégât blastique alvéolaire diffus.**

Immédiatement après chimiothérapie.VI.

Eur Respir J 2012; 39: 648–653
DOI: 10.1183/09031936.00057711

Dexamethasone in patients with acute lung injury from acute monocytic leukaemia

É. Azoulay*, E. Canet*, E. Raffoux#, E. Lengliné#, V. Lemiale*, F. Vincent*, A. de Labarthe#, A. Seguin*, N. Boissel#, H. Dombret# and B. Schlemmer*



3

DIRECT APPROCHE R

la radiographie standard….

Routine radiography does not have a role in the diagnostic evaluation of ambulatory adult febrile neutropenic cancer patients

C.S.M. Oude Nijhuis[a], J.A. Gietema[b], E. Vellenga[c], S.M.G.J. Daenen[c],

4

DIRECT APPROCHE E
Expérience clinique/Connaissance littérature...

« tous les malades peuvent avoir tous » Faux!

E.Azoulay DURPI 2011

Diffuse Alveolar Hemorrhage in Allogeneic Bone Marrow Transplantation

A Postmortem Study

AJRCCM 1995

C. AGUSTÍ, J. RAMIREZ, C. PICADO, A. XAUBET, E. CARERAS, E. BALLESTER, A. TORRES, C. BATTOCHIA, and R. RODRIGUEZ-ROISIN

	Group A BMT Patients, n = 47 (%)	Group B Non-BMT Patients, n = 20 (%)	Group C Control Patients, n = 10 (%)
Diffuse alveolar hemorrage	11 (23)†	1 (5)	0
Bacterial pneumonia	11 (23)	9 (45)	3 (30)
Diffuse alveolar damage	13 (28)	2 (10)	3 (30)
CMV pneumonitis	20 (43)	0	2 (20)
Pulmonary aspergillosis	8 (17)	3 (15)	0
Leukemic infiltration	1 (2)	4 (20)	0
Pulmonary edema	0	2 (10)	0
Herpes pneumonia	2 (4)	0	0
Pulmonary infarction	1 (2)	0	0
Postchemotherapy fibrosis	0	1 (5)	0
Pulmonary hypertension	0	1 (5)	1 (10)
Pulmonary tuberculosis	0	1 (5)	0
Bacterial sepsis	0	1 (5)	0
Pulmonary embolism	0	0	2 (20)
Pneumocystis carinii pneumonia	0	0	1 (10)

Anti-CD 52 et lymphoprolifération
Pas de pneumocystose!
Fludarabine LLC= penser au pneumocystis!

Infectious Complications Associated with Alemtuzumab Use for Lymphoproliferative Disorders

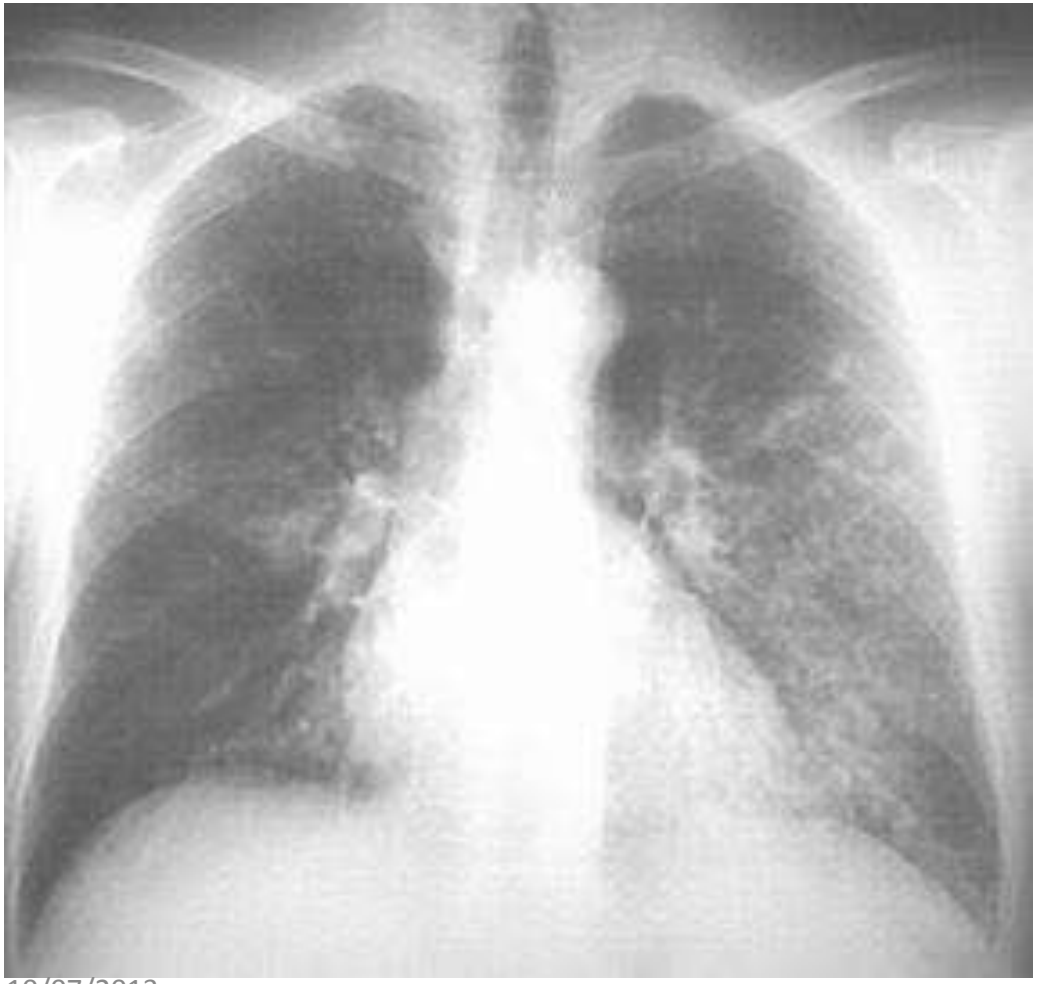
Stanley I. Martin,[1,5a] Francisco M. Marty,[1,4,5] Karen Fiumara,[2] Steven P. Treon,[3,4,5] John G. Gribben,[6] and Lindsey R. Baden[1,4,5]

CID 2006:43 (1 July) • Martin et al.

Table 2. Opportunistic infectious complications after alemtuzumab treatment.

Infection	No. of patients	No. of HSCTs	Cumulative dose, median mg (range)[a]	Time to clinical infection, median days (range)[b]	No. of deaths[c]
Viral					
Adenovirus pneumonia	1	0	253	274[d]	1
CMV viremia	12	4	253 (3–942)	175 (0–652)	1
CMV pneumonitis and colitis	1	0	103	351	1
HSV infection (localized)	2	1	200 (56–343)	62 (52–72)	0
PML	1	0	379	100	1
VZV infection (localized)	1	0	973	540	0
Bacterial					
Group B *Streptococcus* pyomyositis/bacteremia	1	1	73	8	0
Staphylococcus aureus pyomyositis/bacteremia	1	1	53	570	0
Fungal					
Pulmonary aspergillosis	3	2	56 (53–1129)	120 (79–662)	0
Disseminated cryptococcosis	1	0	379	171	0
Disseminated histoplasmosis	1	1	596	298	0
Parasitic					
Cerebral toxoplasmosis	1	1	553	169	0
Disseminated acanthamebiasis	1	1	942	443	1

Leucémie aiguë à tricholeucocytes



Penser aux germes intracellulaires car altération monocytes macrophages!

5

DIRECT APPROCHE C

Clinique…

- ✓ Les anomalies auscultatoires sont rares et n'apportent pas un diagnostic étiologique dans l'IRA chez les POH.

- ✓ Signes extra-thoraciques fréquents (peau, articulations, système nerveux, aires ganglionnaires, tractus digestif)… (exemple: CMV-œsophage)…

- ✓ Les pneumopathies à pneumocystis Jiroveci : évolution subaiguë (2-3 sem) chez les VIH + et aiguë (qq heures) chez les POH.

Azoulay et al. Medicine 2004

Azoulay et al. Rev Mal Resp 2008.

5 tableaux cliniques de référence…

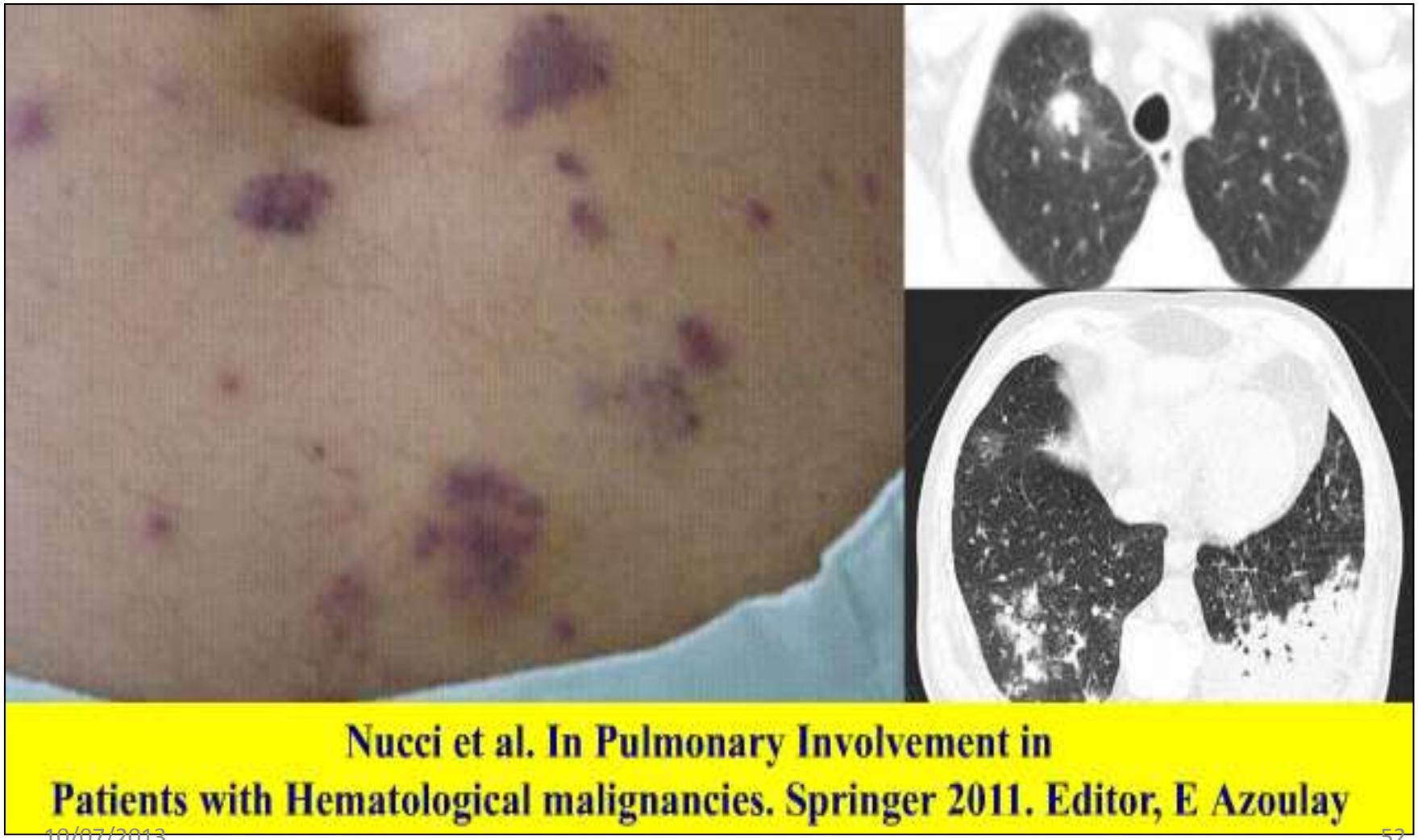
Tableau III.
Diagnostic étiologique de l'insuffisance respiratoire aiguë d'après les données cliniques et radiographiques [51].

Tableau radioclinique	1	2	3	4	5
Vitesse de progression	Lente	Rapide	Rapide	Modérée à rapide	Modérée à rapide
Fièvre	NON	OUI	OUI	OUI	OUI
Radiographie	Infiltrat diffus	Infiltrat diffus	Alvéolaire focal ou diffus	Nodules ± excavation	Alvéolaire focal
Diagnostics suspectés	Insuffisance cardiaque congestive Toxicité médicamenteuse Infiltration spécifique	Infection opportuniste (*P. jirovecii*, CMV, Tuberculose) Toxicité médicamenteuse Infiltration spécifique	Bactéries Sepsis SDRA	Champignons Legionella Tuberculose Maladie thromboembolique	Mycobactéries Nocardia Rhodococcus BOOP Tumeur
Examens de première ligne	Échocardiographie FB-LBA Biopsie pulmonaire	FB-LBA	Hémocultures ECBC Prélèvement distal protégé Traitement immédiat	Scanner Biopsie sous scanner FB+ BTB Biopsie pulmonaire chirurgicale	FB Biopsie

FB : fibroscopie bronchique; FB-LBA : fibroscopie bronchique avec lavage broncho-alvéolaire; BTB : biopsie trans-bronchique ; BOOP : bronchiolite oblitérante avec pneumopathie organisée ; Vitesse de progression : rapide signifie < 2 jours, modérée à rapide signifie 2 à 7 jours, lente signifie > 7 jours.

Fusariose….

Azoulay E. SRLF 2013



Nucci et al. In Pulmonary Involvement in Patients with Hematological malignancies. Springer 2011. Editor, E Azoulay

6

DIRECT APPROCHE T
Scanner thoracique haute résolution

Il n’a jamais été évalué isolément!

Pneumonia in Febrile Neutropenic Patients and in Bone Marrow and Blood Stem-Cell Transplant Recipients: Use of High-Resolution Computed Tomography

J Clin Oncol 17:796-805. © 1999 by American Society of Clinical Oncology.

By Claus Peter Heussel, Hans-Ulrich Kauczor, Gudula E. Heussel, Berthold Fischer, Markus Begrich, Peter Mildenberger, and Manfred Thelen

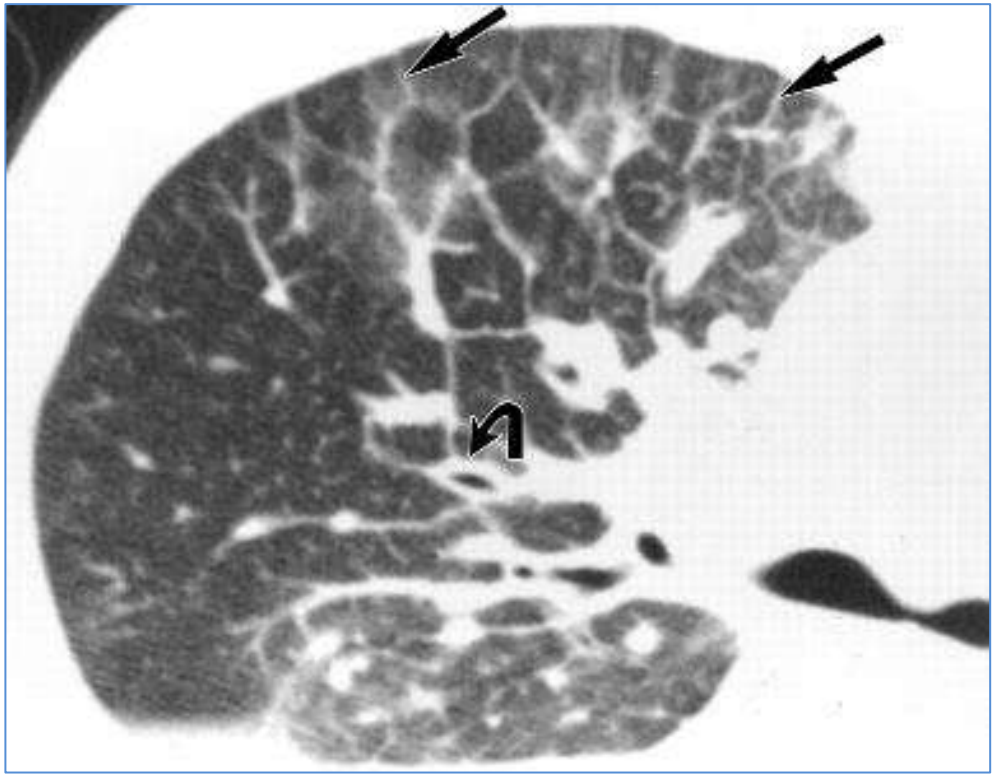
		Microorganism in Combination With		
	No. of Cases	Ground-Glass Opacities	Ill-Defined Nodules	Consolidatio
Candida species	20	15	13	6
Aspergillus species	9	5	6	4
Cocci	8	6	4	2
Enterobacteriaceae	7	4	4	2
Cytomegalovirus, herpes simplex viruses	5	2	2	2
Pseudomonas aeruginosa, stenotrophomonas maltophilia	3	3	1	1
Pneumocystis carinii	3	2	0	1

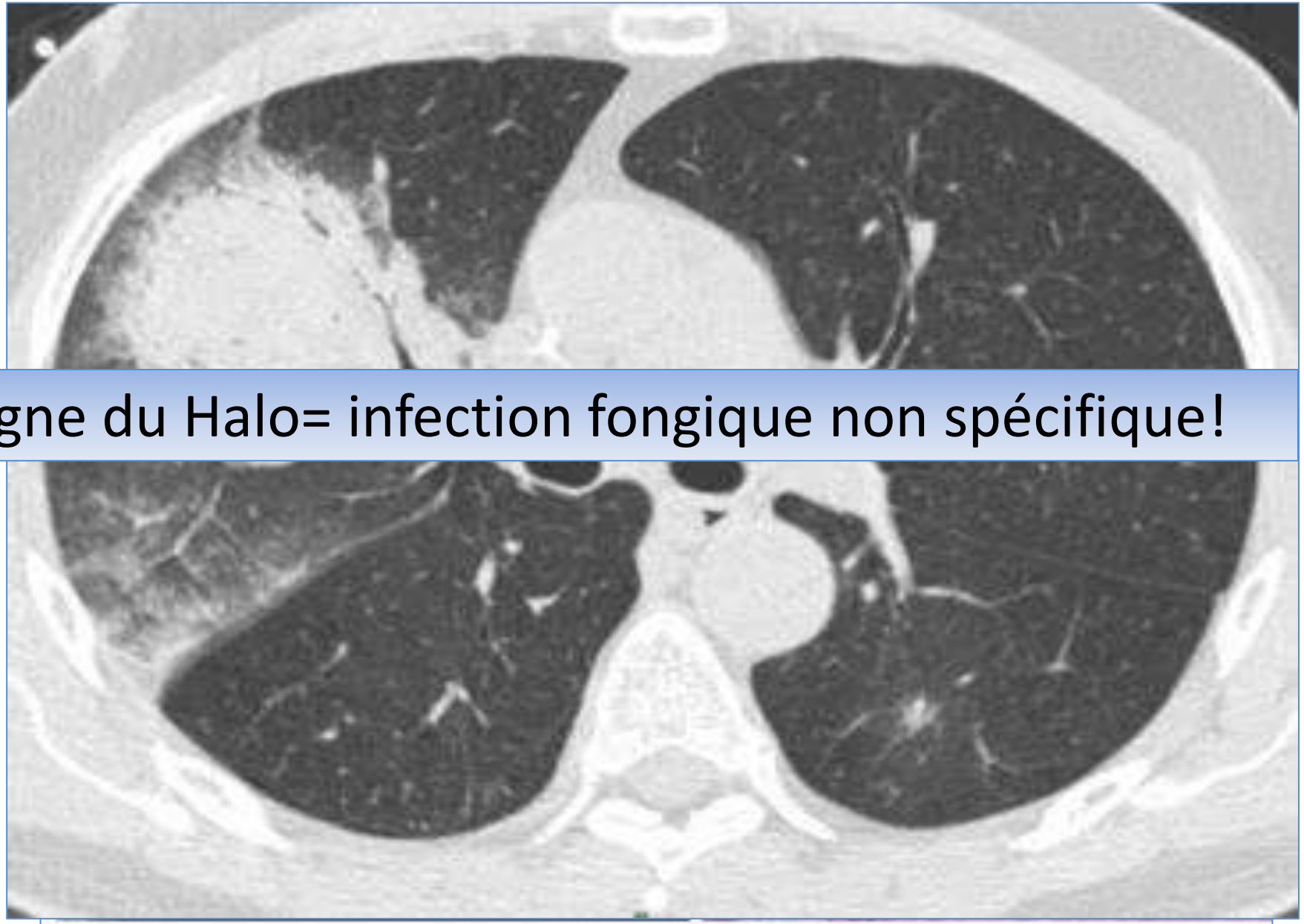
Infiltration pulmonaire leucémique!

Acute Monocytic Leukemia Presenting as Acute Respiratory Failure

Élie Azoulay, Fabienne Fieux, Delphine Moreau, Guillaume Thiery, Philippe Rousselot, Antoine Parrot, Jean-Roger Le Gall, Hervé Dombret, and Benoît Schlemmer

Am J Respir Crit Care Med Vol 167. pp 1329–1333, 2003
Originally Published in Press as DOI: 10.1164/rccm.200206-554OC on February 5, 2003
Internet address: www.atsjournals.org





Signe du Halo= infection fongique non spécifique!

Conclusion 2

- Principale cause des IRA chez les POH: infectieuse!
- Connaître la cause+++ car le pronostic en dépend!
- Eliminer l'OAP cardiogénique.
- Direct APPROCHE permet de guider le traitement empirique et orienter les investigations complémentaires.

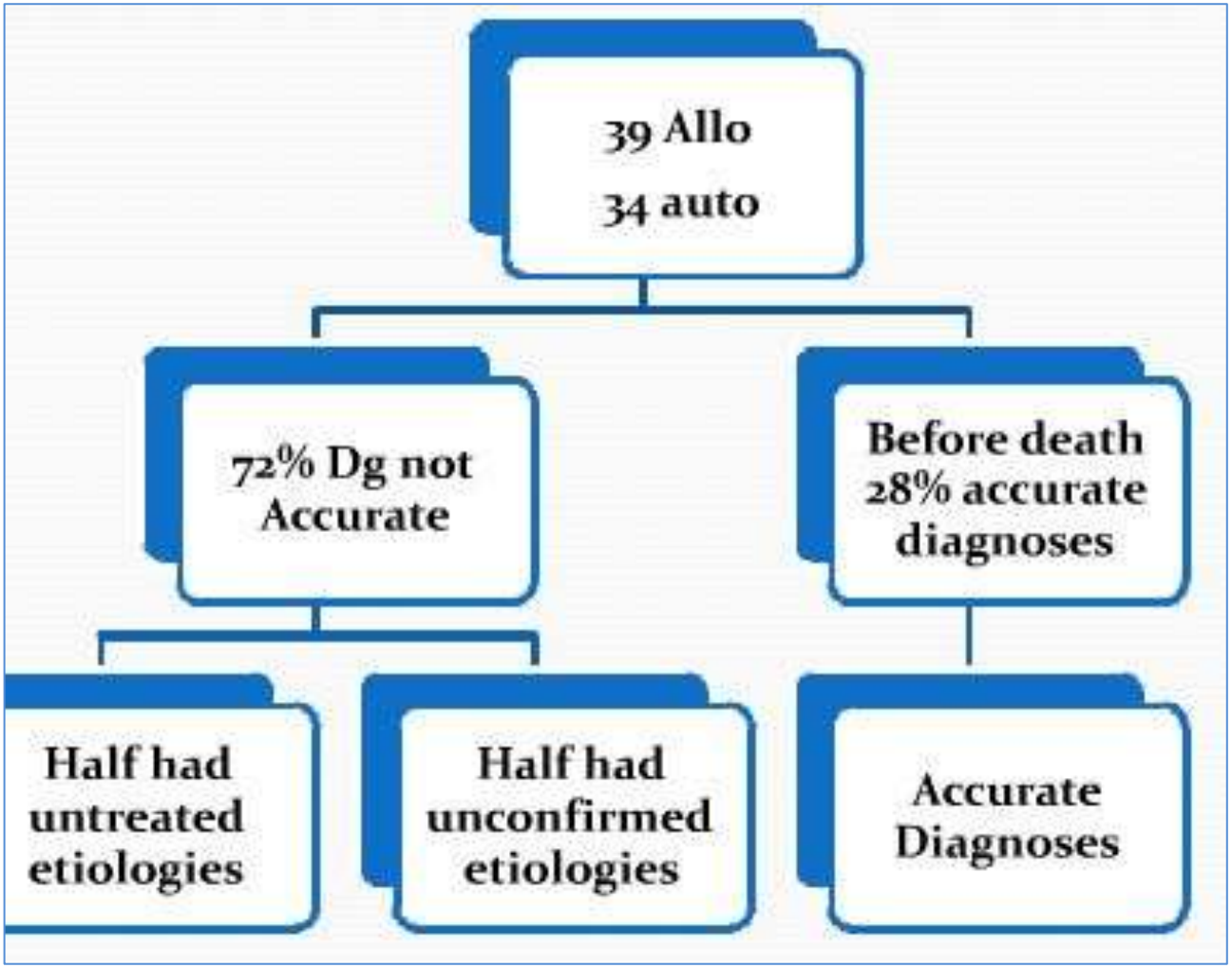
Plan

- Généralités.
- Pronostic des IRA en oncohématologie.
- Diagnostic positif et étiologique.
- **« (Stratégie diagnostique) ».**
- Ventilation mécanique (VNI).

Pulmonary Complications in Adult Blood and Marrow Trans

CHEST / 128 / 3 / SEPTEMBER, 2005

Sunita Sharma, MD; Hassan F. Nadrous, MD; Steve G. Peters, MD, FCCP; Ayalew Tefferi, MD; Mark R. Litzow, MD; Marie-Christine Aubry, MD; and Bekele Afessa, MD, FCCP



Quels sont les stratégies?

Invasive	Semi-invasive	Non invasive
Biopsie pulmonaire	Fibroscopie LBA	Hémocultures
		crachats
		Crachats induits
		Aspiration nasopharyngée
		Ag sanguins et urinaires
		Echocardiographie
		TDM thoracique haute résolution!

Use of Circulating Galactomannan Screening for Early Diagnosis of Invasive Aspergillosis in Allogeneic Stem Cell Transplant Recipients

Johan Maertens,[1] Johan Van Eldere,[2] Jan Verhaegen,[2] Erik Verbeken,[3] Johny Verschakelen,[4] and Marc Boogaerts[1]

Departments of [1]Hematology, [2]Microbiology, [3]Pathology, and [4]Radiology, University Hospital Gasthuisberg, Leuven, Belgium

JOURNAL OF CLINICAL MICROBIOLOGY, Apr. 2000, p. 1461–1467 Vol. 38, No.
0095-1137/00/$04.00+0

Evaluation of Diagnostic Value and Epidemiological Implications of PCR for *Pneumocystis carinii* in Different Immunosuppressed and Immunocompetent Patient Groups

ANDREAS SING.[1]* KARLHEINZ TREBESIUS.[1] ANDREAS ROGGENKAMP.[1] HOLGER RÜSSMANN.[1]

JOURNAL OF CLINICAL MICROBIOLOGY, Sept. 2003, p. 4382–4387 Vol. 41, No. 9
0095-1137/03/$08.00+0 DOI: 10.1128/JCM.41.9.4382–4387.2003

Real-Time PCR Assay Compared to Nested PCR and Antigenemia Assays for Detecting Cytomegalovirus Reactivation in

Quelle stratégie? Invasive OU non invasive?

- En dehors de la réanimation, fibro-LBA pierre angulaire du diagnostic (50%).
- En réanimation, risque d'aggravation de l'état respiratoire….
- En plus faible rendement diagnostique et thérapeutique….
- Fibro-LBA en deuxième intention??

Quelle stratégie? Invasive OU non invasive?

Tableau V.
Rentabilité diagnostique du lavage broncho-alvéolaire chez les patients d'hématologie.

Auteur	Année	Nombre de patients	Diagnostic	Impact diagnostique	Impact thérapeutique
Stover	1984	97	HM	66	/
Martin	1987	100	HM	30	/
Xaubet	1989	96	HM	49	31
Campbell	1989	22	HM	55	/
Pisani	1992	150	HM	39	/
Maschmeyer	1994	46	Neutropénie	30	/
Cordonnier	1994	56	Neutropénie	53	24
Cazzadori	1995	142	HM	36	/
Von Eiff	1995	90	HM	66	65
White	1997	68	HM	31	24
Ewig	1998	49	HM	31	16
Gruson	2000	41	Neutropénie	63	28
Hilbert	2001	24 / 46	HM	62	71
Murray	2001	27	HM	33	28
Azoulay	2004	203	HM	49.5	45.1
Pagano	1997	127	HM	53	14
Jain	2004	104	HM	56	/
Hohenadel	2001	95	HM	30	/
Total	/	**1537**		**46.2**	**34.6**

HM : hémopathie maligne.

Quelle stratégie? Invasive OU non invasive?

Tableau VI.
Impact diagnostique du lavage broncho-alvéolaire chez les patients greffés de moelle.

Auteur	Année	Nombre de patients	Type de patients	Impact diagnostique	Impact thérapeutique	Complications
Springmeyer	1982	22	Auto-Allo	58	/	13
Cordonnier	1985	52	Allo	50	/	0
Cordonnier	1986	69	Allo	66	/	/
Milburn	1987	40	Allo	80	76	0
Springmeyer	1987	15	Auto-Allo	89	/	40
Heurlin	1989	18	Auto-Allo	61	/	/
Weiss	1993	47	Auto-Allo	47	/	12
Campbell	1993	27	/	74	63	11
AbuFarsakh	1995	77	Auto-Allo	42	/	/
White	1997	68	Auto-Allo	31	24	15 (7 % VM)
Dunagan (32 % MV)	1997	71	Auto-Allo	38	42	27 (4 % VM)
Glazer	1998	79	Auto-Allo	67	62	/
Gruson	1999	38	Auto-Allo	42	/	/
Gruson	2000	52	Auto-Allo	38	28	17
Huaringa	2000	89	Auto-Allo	42	/	/
Total	**10**	**764**	**Auto-Allo**	**55**	**49**	**0 à 40 %**

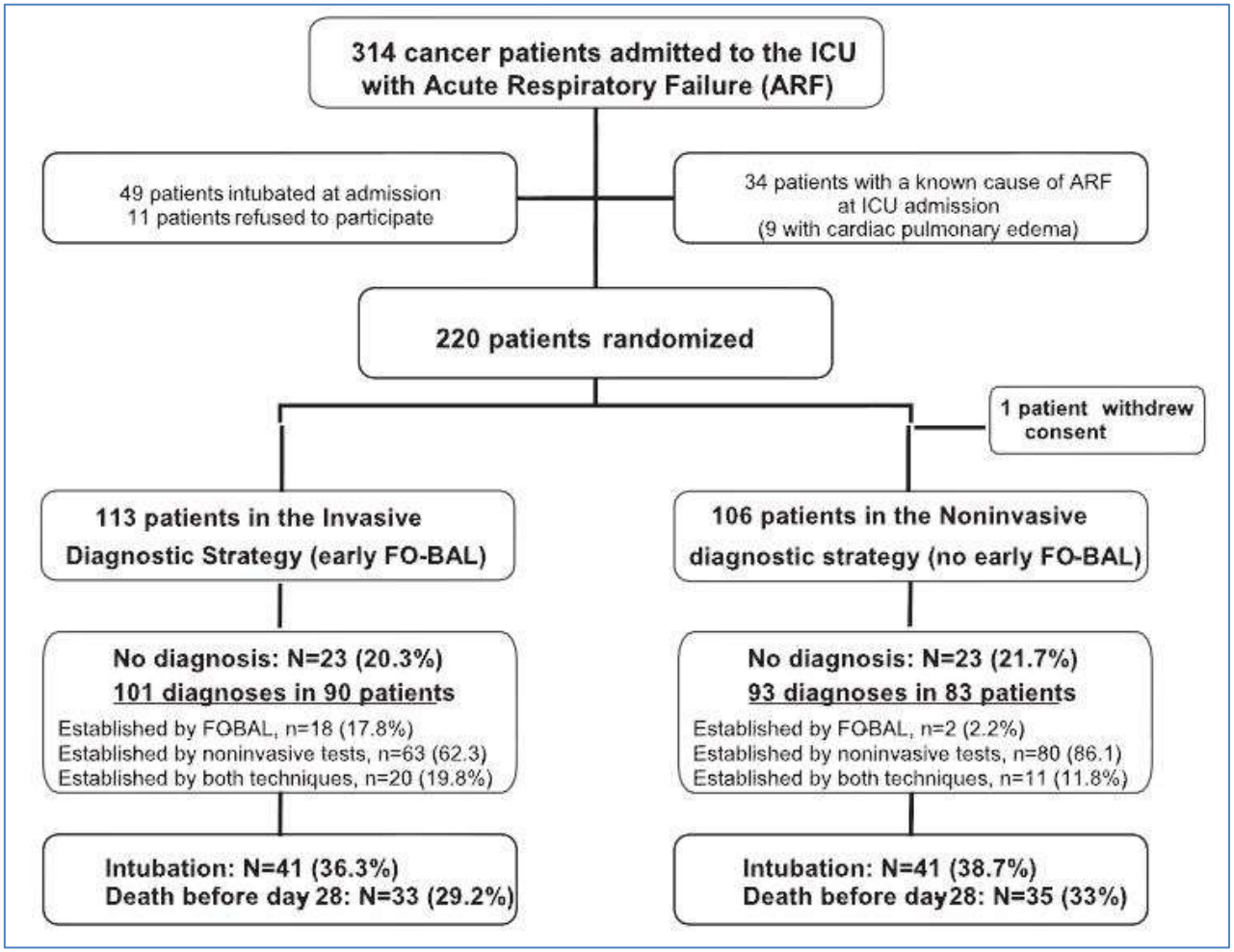
VM : ventilation mécanique; Auto : autogreffe de cellules souches hématopoïétiques; Allo : allogreffe de moelle.

Diagnostic Strategy for Hematology and Oncology Patients with Acute Respiratory Failure

Randomized Controlled Trial

Am J Respir Crit Care Med Vol 182. pp 1038–1046, 2010

Élie Azoulay[1], Djamel Mokart[2], Jérôme Lambert[3], Virginie Lemiale[4], Antoine Rabbat[5], Achille Kouatchet[6], François Vincent[7], Didier Gruson[8], Fabrice Bruneel[9], Géraldine Epinette-Branche[1], Ariane Lafabrie[1], Rebecca Hamidfar-Roy[10], Christophe Cracco[11], Benoît Renard[12], Jean-Marie Tonnelier[13], François Blot[14], Sylvie Chevret[3], and Benoît Schlemmer[1]



Diagnostic Strategy for Hematology and Oncology Patients with Acute Respiratory Failure

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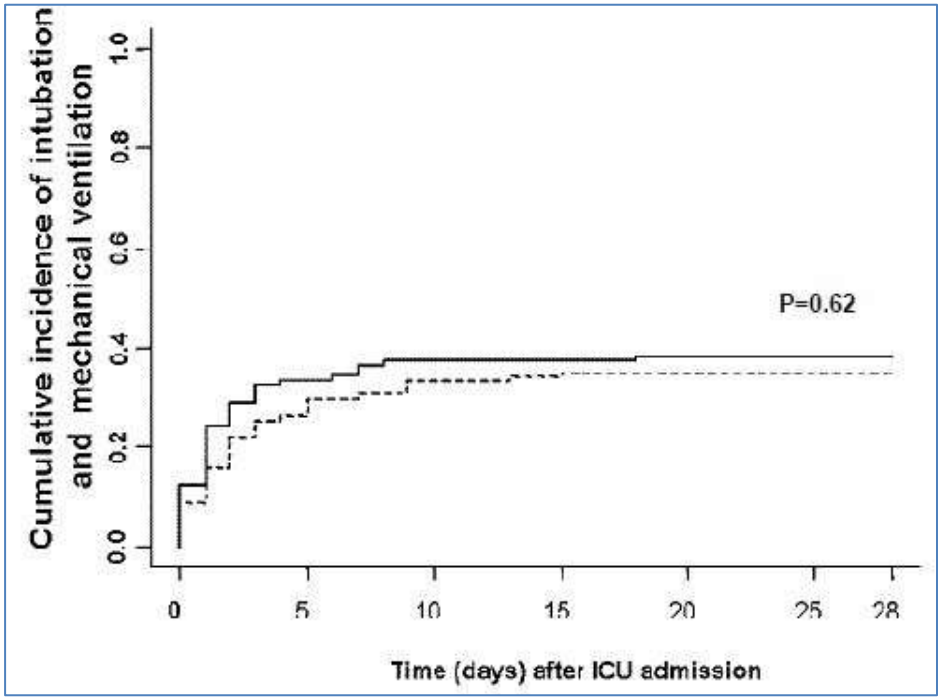
Diagnoses	Diagnosis made by NIT
• CPO: 10	• 10 (100%)
• Fungi: 23	• 22 (95.6%)
• Aspergilus: 18	• 17 (94%)
• Virus: 26	• 24 (92.3%)
• Malignancy: 16	• 13 (81%)
• Pneumocystis: 19	• 15 (79%)
• Bacteria: 86	• 57 (66.3%)

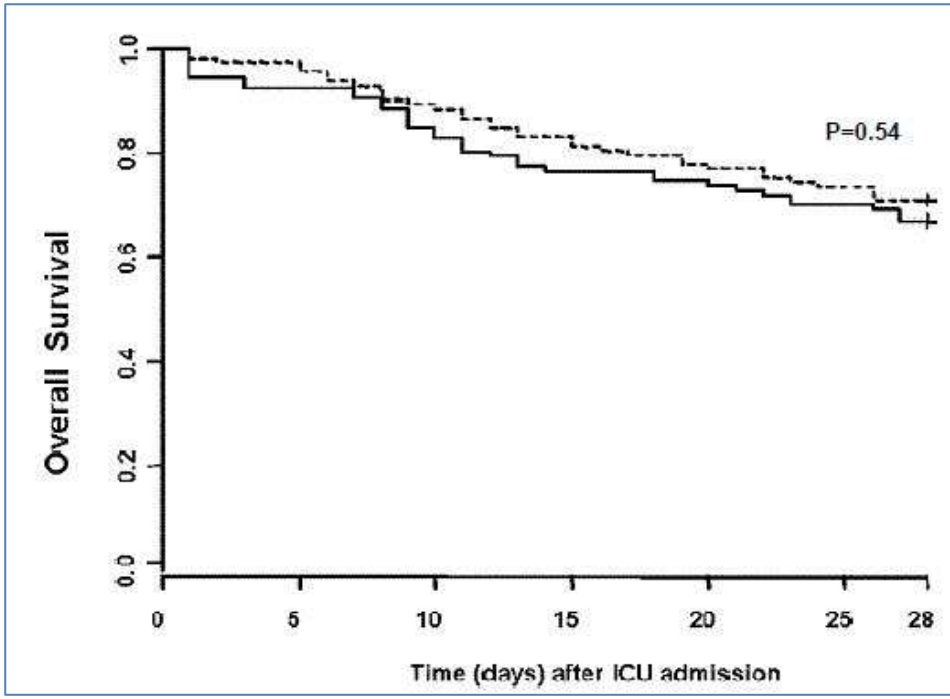
Diagnostic Strategy for Hematology and Oncology Patients with Acute Respiratory Failure

Randomized Controlled Trial

Am J Respir Crit Care Med Vol 182. pp 1038–1046, 2010

Élie Azoulay[1], Djamel Mokart[2], Jérôme Lambert[3], Virginie Lemiale[4], Antoine Rabbat[5], Achille Kouatchet[6], François Vincent[7], Didier Gruson[8], Fabrice Bruneel[9], Géraldine Epinette-Branche[1], Ariane Lafabrie[1], Rebecca Hamidfar-Roy[10], Christophe Cracco[11], Benoît Renard[12], Jean-Marie Tonnelier[13], François Blot[14], Sylvie Chevret[3], and Benoît Schlemmer[1]





Indications résiduelles LBA?

- **En première intention**

– Toxicité pulmonaire des médicaments (rare en réa)

– Pneumocystose si diagnostic non invasif inaccessible ou infaisable

– Malade ventilé?

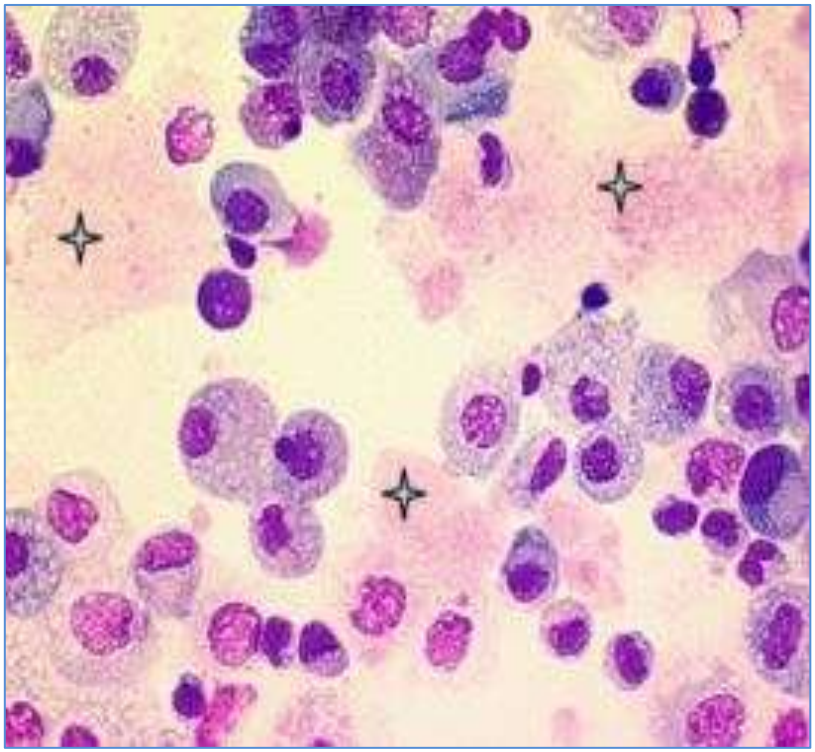
- **Ensuite…**

– Avant une biopsie pulmonaire

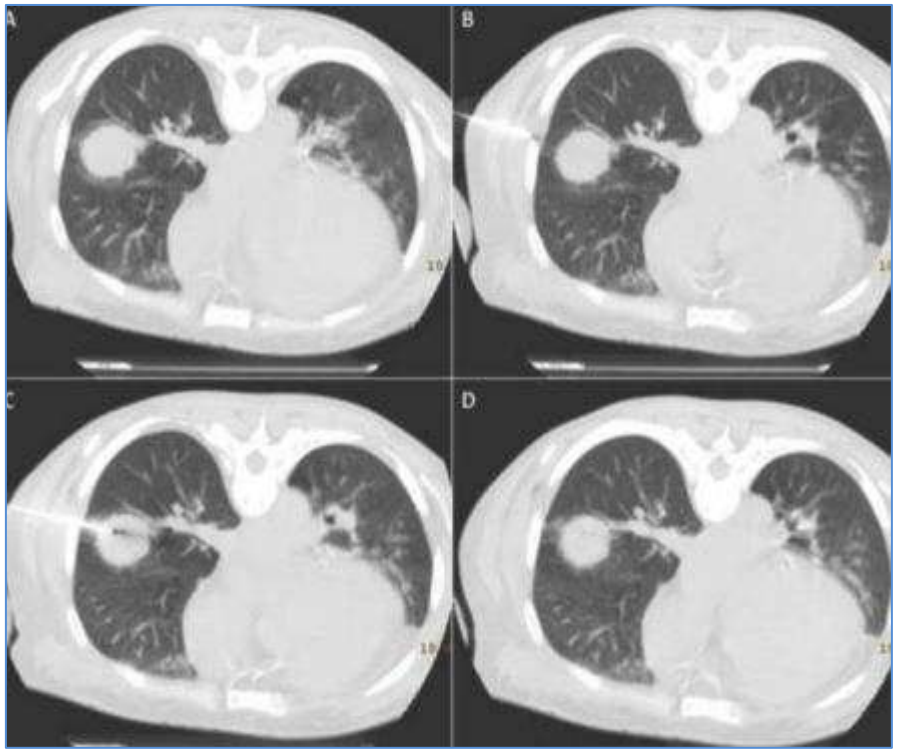
– Nouvelle nosologie

– Diagnostic non-infectieux au cours des lymphoprolférations (non neutropénique).

LBA, protéinose alvéolaire…



Biopsie – aspergillose invasive…



De Bazelaire et al.

Conclusion 3

The Minimax Study AJRCCM 2010

- In hematology and oncology patients with early hypoxemic ARF, FO-BAL is safe when performed in the ICU.
- Noninvasive diagnostic tests provide the diagnosis in most of these patients.
- Because 18% of patient diagnoses are made only by FOB-BAL, this procedure should be added to noninvasive tests if feasible early after ICU admission.

Plan

- Généralités.
- Pronostic des IRA en oncohématologie.
- Diagnostic positif et étiologique.
- « (Stratégie diagnostique) ».
- **Ventilation mécanique (VNI).**

Rationnel

- **Rationnel: des risques infectieux importants secondaires à une intubation endo trachéale du patient immunodéprimé ont amené à proposer la VNI comme technique curative permettant de diminuer le recours à l'intubation.**

- **Chez les patients d'oncohématologie et neutropéniques:**

1-amélioration du pronostic.

2-diminution des complications: infections, hémorragies chez les thrombopéniques…

Conti G. et al ICM 1998
Azoulay et al. CCM 2001
Antonelli et al. JAMA 2000

Motifs de recours à la VM

Respiratoire++++++

- Insuffisance respiratoire aiguë hypoxémique (62-87%).
- OAP cardiogénique (12-16%).
- Hémorragie intra-alvéolaire (10-17%).

Neurologique +

Coma (20%).

Convulsions (11-15%)

Hémodynamique:

Choc septique (30-60%)

Conti et al. ICM 1998
Hilbert et al. NEJM 2001
Azoulay et al. CCM 2001

Faisabilité: les premières études…

1992: 2 abstracts ICM

PRESSURE SUPPORT VENTILATION BY FACIAL MASK IN IMMUNOCOMPROMISED PATIENTS WITH RESPIRATORY FAILURE

A Rabbat M T Garrouste G Nahmias J R Le Gall B Schlemmer

Immunocompromised (IC) patients with acute respiratory failure (ARF) requiring endotracheal intubation and mechanical ventilation (MV) have a very poor prognostic. The aim of this prospective study was to evaluate the efficacy of a non invasive ventilatory assistance pressure support by means of a face mask (PSFM) in IC patients with ARF. METHODS ARF was defined by a respiratory rate (RR) > 25/mn and Pa02 < 55 mmHg at room air or Pa02 / FiO2 < 250 mmHg and bilateral infiltrates on the chest X- ray. The pressure support at a level between 8 to 25 cm of water was delivered through a tight fitting facial mask by a Cesar (CFPO) ventilator. A PEP of 5 cm of water was added.

RESULTS 19 IC patients (13 AIDS 6 neutropenics with hematological malignencies), SAPS = 11.8 ± 4.1, aged 38 ± 9 years 17 males were initially treated with PSFM. The ARF was due to infection in 15 cases. In 12 patients PSFM was a succes avoiding tracheal intubation. 7 patients were intubated (5 deaths)

	Entry	H+1	H+24	Discharge
	n = 19	n = 19	n = 19	n = 12
RR (/ mn)	38±7	29±5*	2[illegible]	21±3*
HR (/ mn)	109±17	105±20	9[illegible]	84±2[illegible]
MAP (mmHg)	89±17	88±19	8[illegible]	79±4
PaC02 (mmHg)	34±7	36±6	3[illegible]	36±4
Pa02 / FI02 (mmHg)	143±65	259±91*	246±124*	3[illegible]

* p < 0.001 vs entry

All patients tolerated well the PSFM ventilation. Mean daily administration of PSFM was 6 ± 2 hours (2-12) during 1 to 21 days. Time of intubation (failure of PSFM) was early (< 48 h) for 5 patients: 2 septic shocks (2 deaths), 1 massive pulmonary hemorrage (dead), 2 after BAL (2 alive) or late for 2 patients with severe ARDS on day 13 and day 21 (2 deaths).

CONCLUSIONS Pressure support ventilation delivered by face mask in immunocompromised patients with respiratory failure result in early physiologic improvement and may reduce the need for intubation and mechanical ventilation.

Department of intensive care, University Hospital Saint Louis, 75010 Paris, France

P17

RESPIRATORY DISTRESS TREATED BY POSITVE PRESSURE VENTILATION THROUGH A FACIAL MASK IN HEMATOLOGICAL PATIENTS

E.Tognet, A.Mercatello, B.Coronel, P.Polo, Y.Devaux, M.Bret, E.Archimbaud, D.Fière, J.F.Moskovtchenko.

Patients with hematological disease need sometimes respiratory support (RS) for acute respiratory failure (ARF). Unfortunately the mortality rate of patients requiring endotracheal intubation and mechanical ventilation is from 50 to 80% in relation to the nosocomial complications and to the degree of aplasia. In those patients, both endotracheal intubation and mechanical ventilation induce numerous complications. Therefore, there is a need for methods of ventilatory assistance that could obviate the necessity for intubation in hematological patients. Ventilation has been assisted non invasively by means of positive pressure ventilation administered through a facial mask (FM). Inspiratory-pressure support (IPS) is a new method of partial ventilatory assistance in which constant positive pressure is applied during the patient's spontaneous inspiration. This mode of RS reduces respiratory-muscle work. But this technique is difficult to use routinely because it requires numerous conditions including: cooperation from patient and ability to tolerate FM. The aim of this study is to test IPS [illegible]

15 patients (7 females) aged 36 years and treated for acute leukemia (14) or myeloma (1) were prospectively ventilated through FM. The onset of ARF occurred in 4 cases just before the induction of chemotherapy, 7 during aplasia and 4 at the end of aplasia. The causes of ARF were alveolar hemorrhages (2 cases), infections (9), hemodynamic edema (2) and unknown (2). At the time of admission in ICU, respiratory rate (RR) was 33 breaths/mn and PaO2 lesser than 6kPa while the patients were breathing air room. Intermittent treatment with IPS was instituted at a level of pressure from 16 to 20 cm of water (Servo ventilator type C, Siemens). The FiO2 was adapted to the result of PaO2 (40<FiO2<70%).

Out of 15 patients, 4 had immediate failure which resulted in endotracheal intubation within 3 hours. The causes of failure were : impossibility to adapt IPS to the patient (3) and cardiac arrest (1). 5 patients were intubated during IPS (seizure [1], gastric dilatation [1], hemoptysie [1] and impossibility to adapt IPS to the patient [3]). These 9 patients died. IPS was achieved with success in 6 patients who were discharged from ICU. In the 11 patients treated by IPS, the [illegible] number of days during which treatment was administered ranged from 1 to 16 (mean 5.4 days). RR decreased from 33 to 23, PaO2 increased (17,7kPa); PaCO2 remained stable (4,2kPa). Any hemodynamic change was noticed. Local tolerance of FM was excellent.

Intensive Care Med (1998) 24: 1283–1288
© Springer-Verlag 1998

ORIGINAL

G. Conti
P. Marino
A. Cogliati
D. Dell'Utri
A. Lappa
G. Rosa
A. Gasparetto

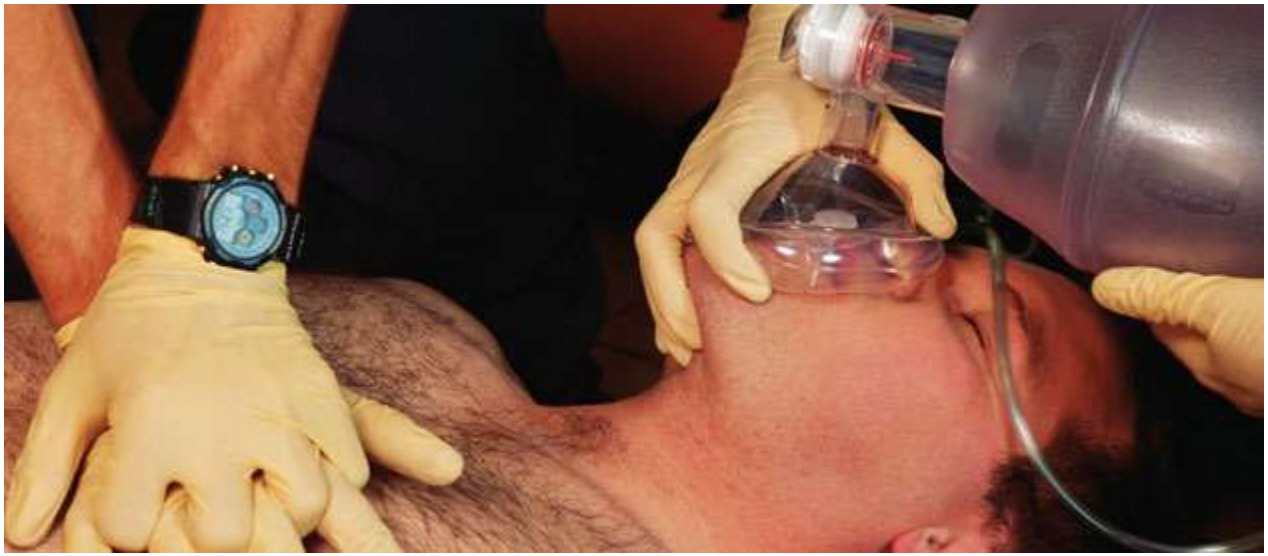
Noninvasive ventilation for the treatment of acute respiratory failure in patients with hematologic malignancies: a pilot study

Etude prospective clinique mono centrique 16 patients, Rome.

Table 1 Clinical details of the 16 patients (*SAPS* simplified acute physiology score, *NHL* non-Hodgkin lymphoma, *AML* acute myelocytic leukemia, *ALL* acute lymphoblastic leukemia, *CML* chronic myelocytic leukemia, *NCPE* noncardiogenic pulmonary edema, *CPE* cardiogenic pulmonary edema, *BP* bacterial pneumonia, *VP* viral pneumonia, *FP* fungal pneumonia)

Patient	Age (years)	Sex	Diagnosis	Cause	SAPS	Length of treatment	Outcome
1	56	M	NHL	BP	14	8 (days)	Died
2	23	M	AML	NCPE	13	8	Survived
3	29	M	AML	CPE	17	1	Died
4	27	M	AML	BP	18	2	Died
5	51	F	AML	VP	10	5	Died
6	64	M	NHL	FP	10	5	Survived
7	64	M	NHL	FP	16	3	Died
8	38	M	CML	BP	14	3	Survived
9	68	M	NHL	VP	12	5	Survived
10	19	M	NHL	FP	10	6	Survived
11	26	F	AML	FP	12	3	Survived
12	14	F	ALL	BP	14	3	Survived
13	23	F	CML	VP	16	2	Survived
14	62	F	AML	FP	14	9	Survived
15	23	F	CML	BP	12	2	Survived
16	25	M	ALL	FP	12	4	Survived

IMPACT SUR LE PRONOSTIC



90-98: 237 patients Saint Louis, rétrospective, CCM 2001

Analyse uni variée de la mortalité à 30 jours

Improved survival in cancer patients requiring mechanical ventilatory support: Impact of noninvasive mechanical ventilatory support

Elie Azoulay, MD; Corinne Alberti, MD; Caroline Bornstain, MD; Ghislaine Leleu, MD; Delphine Moreau, MD; Christian Recher, MD; Sylvie Chevret, MD, PhD; Jean-Roger Le Gall, MD; Laurent Brochard, MD, PhD; Benoît Schlemmer, MD

Variables	Odds ratio	95% CI	*p* Value
Noninvasive mechanical ventilation	0.343	0.16–0.73	<.0001
ICU admission between 1996 and 1998	0.24	0.12–0.50	<.0001
SAPS II score (per point)	1.04	1.02–1.06	<.0001

CI, confidence interval; ICU, intensive care unit; SAPS, simplified acute physiology score.

Goodness-of-fit (Hosmer-Lemeshow) chi-square *p* Value = .688.

Amélioration mortalité, NNT=3,7

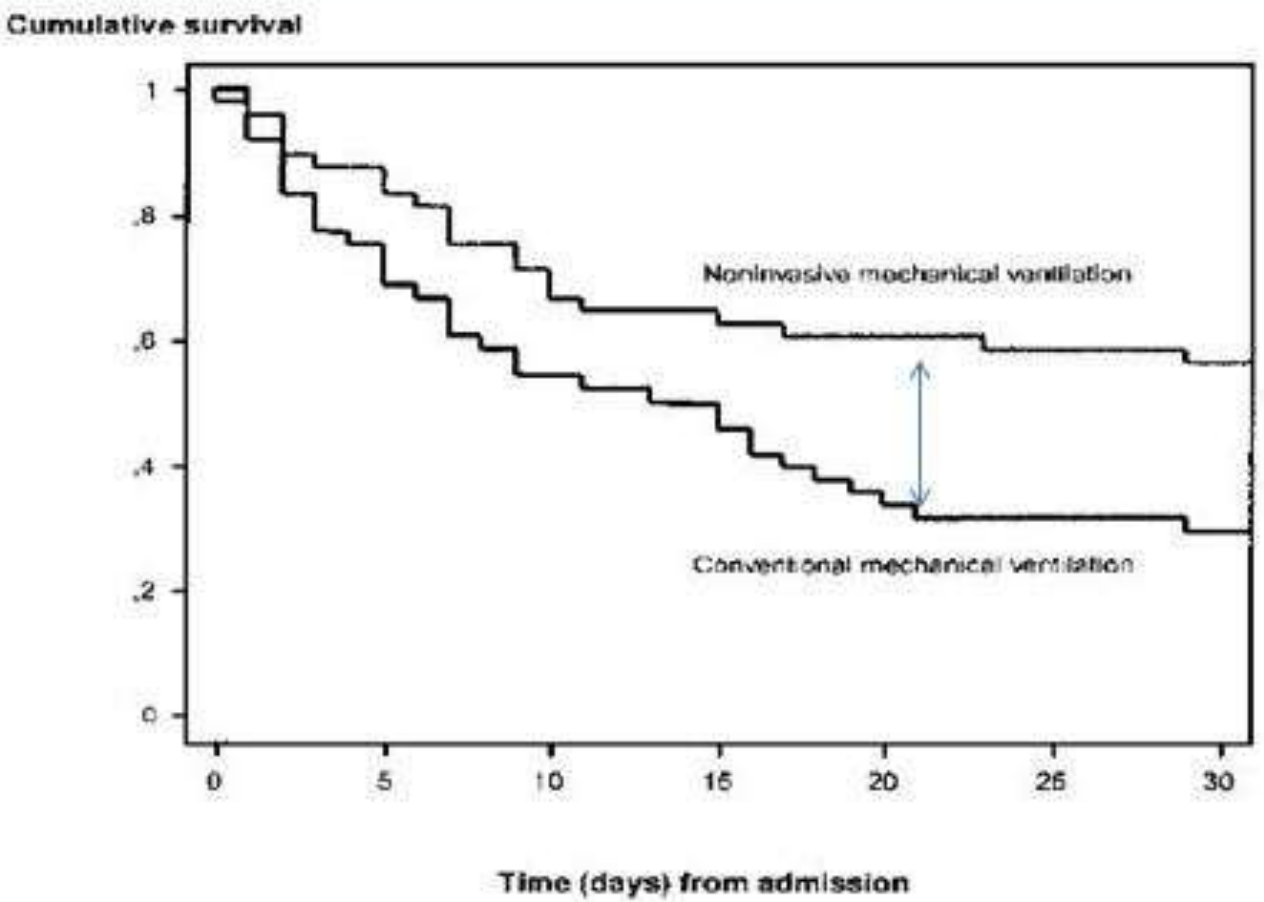


Figure 1. Crude mortality rates.

1ére étude prospective randomisée contrôlée.
Patients mono défaillants…

The New England Journal of Medicine

NONINVASIVE VENTILATION IN IMMUNOSUPPRESSED PATIENTS WITH PULMONARY INFILTRATES, FEVER, AND ACUTE RESPIRATORY FAILURE

GILLES HILBERT, M.D., DIDIER GRUSON, M.D., FRÉDERIC VARGAS, M.D., RUDDY VALENTINO, M.D., GEORGES GBIKPI-BENISSAN, M.D., MICHEL DUPON, M.D., JOSY REIFFERS, M.D., AND JEAN P. CARDINAUD, M.D.

TABLE 2. OUTCOMES OF TREATMENT.*

OUTCOME	NONINVASIVE-VENTILATION GROUP (N=26)	STANDARD-TREATMENT GROUP (N=26)	P VALUE	RELATIVE RISK (95% CI)
Intubation — no./total no. (%)	12/26 (46)	20/26 (77)	0.03	0.60 (0.38–0.96)
Immunosuppression from hematologic cancer and neutropenia	8/15 (53)	14/15 (93)	0.02	0.57 (0.35–0.93)
Drug-induced immunosuppression	3/9 (33)	5/9 (56)	0.32	0.60 (0.20–1.79)
Immunosuppression from the acquired immunodeficiency syndrome	1/2 (50)	1/2 (50)	0.83	1.00 (0.14–7.10)
Initial improvement in PaO_2:FiO_2 — no. (%)	12 (46)	4 (15)	0.02	
Sustained improvement in PaO_2:FiO_2 without intubation — no. (%)	13 (50)	5 (19)	0.02	
Death in the ICU — no./total no. (%)†	10/26 (38)	18/26 (69)	0.03	0.56 (0.32–0.96)
Immunosuppression from hematologic cancer and neutropenia	7/15 (47)	13/15 (87)	0.02	0.54 (0.30–0.96)
Drug-induced immunosuppression	3/9 (33)	4/9 (44)	0.50	0.75 (0.23–2.44)
Immunosuppression from the acquired immunodeficiency syndrome	0/2	1/2 (50)	0.50	0.50 (0.13–2.00)
Total duration of any ventilatory assistance — days				
Among all patients	6±3	6±5	0.59	
Among survivors	5±2	3±5	0.12	
Length of ICU stay — days				
Among all patients	7±3	9±4	0.11	
Among survivors	7±3	10±4	0.06	
Death in the hospital — no./total no. (%)	13/26 (50)	21/26 (81)	0.02	0.62 (0.40–0.95)
Immunosuppression from hematologic cancer and neutropenia	8/15 (53)	14/15 (93)	0.02	0.57 (0.35–0.93)
Immunosuppression from the acquired immunodeficiency syndrome	1/2 (50)	1/2 (50)	0.83	1.00 (0.14–7.10)

Noninvasive Ventilation for Treatment of Acute Respiratory Failure in Patients Undergoing Solid Organ Transplantation

A Randomized Trial

Massimo Antonelli, MD
Giorgio Conti, MD
Maurizio Bufi, MD
Maria Gabriella Costa, MD
Angela Lappa, MD
Monica Rocco, MD
Alessandro Gasparetto, MD
Gianfranco Umberto Meduri, MD

Context Noninvasive ventilation (NIV) has been associated with lower rates of endotracheal intubation in populations of patients with acute respiratory failure.

Objective To compare NIV with standard treatment using supplemental oxygen administration to avoid endotracheal intubation in recipients of solid organ transplantation with acute hypoxemic respiratory failure.

Design and Setting Prospective randomized study conducted at a 14-bed, general intensive care unit of a university hospital.

Patients Of 238 patients who underwent solid organ transplantation from December 1995 to October 1997, 51 were treated for acute respiratory failure. Of these, 40 were eligible and 20 were randomized to each group.

Table 2. Outcome Variables*

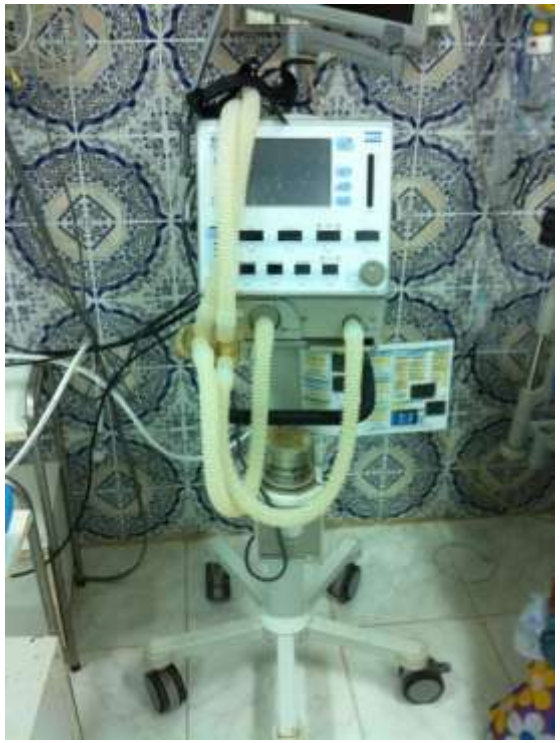
Variable	Noninvasive Ventilation Group (n = 20)	Standard Treatment Group (n = 20)	*P* Value
Initial improvement in ratio of PaO_2 to fraction of inspired oxygen	14 (70)	5 (25)	.005
Sustained improvement in ratio of PaO_2 to fraction of inspired oxygen, without intubation	12 (60)	5 (25)	.03
Patients intubated within 24 h of study entry	3 (15)	10 (50)	.02
Patients requiring intubation	4 (20)	14 (70)	.002
Failures per subgroup of patients			
Acute respiratory distress syndrome (pulmonary etiology)†	2/5 (40)	2/2 (100)	.28
Acute respiratory distress syndrome (extrapulmonary etiology)†	1/3 (33)	4/5 (80)	.28
Pneumonia†	1/2 (50)	1/2 (50)	.83
Cardiogenic pulmonary edema†	0/4 (0)	5/5 (100)	.007
Pulmonary embolism	0/1 (0)	0/1 (0)	.99
Mucous plugging or atelectasis†	0/5 (0)	2/5 (40)	.22
Duration of mechanical ventilation, d‡§	4 (5)	5 (6)	.58
Duration of mechanical ventilation in survivors, d‡	2 (0.7)	1.6 (2)	.50
Duration of use for all invasive devices present at study entry, d‡	5 (5)	9 (6)	.05
Length of intensive care unit stay, d‡	7 (5)	10 (6)	.18
Length of intensive care unit stay in survivors, d‡	5.5 (3)	9 (4)	.03
Intensive care unit deaths‖	4 (20)	10 (50)	.05
Intensive care unit deaths per subgroup of patients†			
Acute respiratory distress syndrome	3/8 (37)	4/7 (57)	.40
Pneumonia	1/2 (50)	1/2 (50)	.80
Cardiogenic pulmonary edema	0/4 (0)	4/5 (80)	.04
Pulmonary embolism	0/1 (0)	0.1 (0)	.99
Mucous plugging or atelectasis	0/5 (0)	1/5 (20)	.50
Hospital deaths¶	7 (35)	11 (55)	.17

Résultats de ces études

- **Si la VNI reste controversée en cas d'hypoxémie chez les patients non immunodéprimés, elle diminue clairement la mortalité chez les patients d'hématologie (Hilbert et al. NEJM 2001) et chez les patients transplantés (Antonelli et al. JAMA 2000).**

- **Ces études majeures ont inclus des patients mono défaillants sans choc et sans trouble de la conscience.**

Quels réglages particuliers de cette VNI en hématologie lourde?



Réglage de la VNI (1)

- En continu puis des séances très rapprochées…
- Durée moyenne: 5 à 9 jours…
- Masque facial le plus souvent…
- Surveillance clinique très rapprochée…
- Expertises des équipes soignantes…
- Moins traumatique…
- Pas de dispositifs invasifs associés: SG…

Antonelli JAMA 2000 Hilbert NEJM 2001 Conti G. ICM 1998 Tognet E. ICM 1992

Réglage de la VNI (2)

- **Conti G. ICM 1998**: AI: 16± 2 cmH2O, Peep: 5± 0,3 cmH2O. FiO2 à 0,5.

Continu puis 4-8h/ 24 heures.

- **Azoulay E. CCM 2001**: Peep 3-7 cmH2O, FiO2 qsp SpO2>95%, >4h/24h >24h.

- **Hilbert G. et al. NEJM 2001**: Peep <10 cmH2O, FiO2<65%, Vt >7ml/kg, 45min/ 3 heures.

- **Antonelli M.et al. JAMA 2000**: Vt de 8 à 10 ml/kg, Peep <10 cmH2O, FiO2<60%.

COMPLICATIONS DE LA VNI

Peu spécifiques…

Intensive Care Med (1998) 24: 1283–1288

ORIGINAL

G. Conti
P. Marino
A. Cogliati
D. Dell'Utri
A. Lappa
G. Rosa
A. Gasparetto

Noninvasive ventilation for the treatment of acute respiratory failure in patients with hematologic malignancies: a pilot study

Table 3 Complications during the study

Complications	*n*	Leading to death
Septic shock	3	3
Gastrointestinal hemorrhage	1	1
Acute myocardial infarction	2	1
Skin necrosis	5	0

NEJM 2001

NONINVASIVE VENTILATION IN IMMUNOSUPPRESSED PATIENTS WITH PULMONARY INFILTRATES, FEVER, AND ACUTE RESPIRATORY FAILURE

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TABLE 3. SERIOUS COMPLICATIONS AND COMPLICATIONS RESULTING IN DEATH IN THE INTENSIVE CARE UNIT.*

VARIABLE	NONINVASIVE-VENTILATION GROUP (N=26)	STANDARD-TREATMENT GROUP (N=26)	P VALUE
Patients with serious complications — no. (%)	13 (50)	21 (81)	0.02
Patients with complications causing death in the ICU — no. (%)	10 (38)	18 (69)	0.03
Serious complications — no. causing death in the ICU/total no. (% of group)			
Severe sepsis or septic shock†	8/8 (31)	11/12 (46)	0.26
Cardiogenic shock	1/1 (4)	2/2 (8)	0.50
Renal failure‡	0/2 (8)	0/4 (15)	0.33
Hepatic failure†	0/5 (19)	0/7 (27)	0.51
Ventilator-associated pneumonia§	2/2 (8)	6/6 (23)	0.12
[illegible]	[illegible]	[illegible]	[illegible]
Gastrointestinal bleeding	0/1 (4)	1/2 (8)	0.50

Noninvasive Ventilation for Treatment of Acute Respiratory Failure in Patients Undergoing Solid Organ Transplantation

A Randomized Trial

Antonelli et al. JAMA 2000

Table 3. Serious Complications and Fatal Events in the 2 Groups

	Noninvasive Ventilation Group (n = 20)	Standard Treatment Group (n = 20)	*P* Value
No. (%) of patients with complications	8 (40)	12 (60)	.17
No. of complications occurring after intubation and causing death in intensive care unit	4	10	.05
No. of complications per patient	1.12	1.4	.60
Total No. of complications/No. causing death in intensive care unit (%)			
Cardiogenic shock	1/0 (5)	2/2 (10)	.50
Organ rejection	4/0 (20)	3/0 (15)	.25
Primary liver malfunction	1/0 (5)	1/0 (5)	.75
Worsening of infections present at study entry*	2/2 (10)	2/2 (15)	.50
Ventilator-associated pneumonia	2/2 (10)	4/4 (20)	.33
Severe sepsis and septic shock with multiple organ failure after study entry	4/4 (20)	10/8 (50)	.05
Gastrointestinal bleeding	1/0 (5)	0/0 (0)	.99

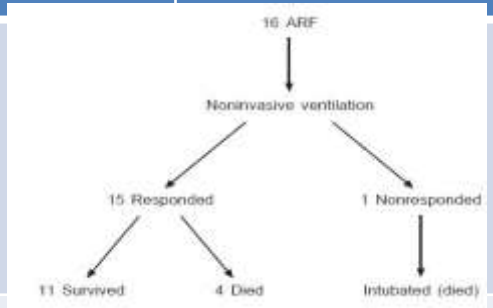
*At study entry, 5 patients had an identified infection without meeting clinical criteria for severe sepsis; 4 had pneumonia; and 1 had pancreatic abscess. These infections worsened; at 3 (2) days, expressed as mean (SD), after study entry the patients met criteria for severe sepsis (2 pneumonia, 1 in each group), or septic shock (2 pneumonia and 1 pancreatic abscess). The other 9 septic complications occurred 12 (5) days after study entry. Note that the number of septic complications occurring after the study entry included those infections present at study entry that worsened and pneumonia leading to severe sepsis and septic shock.

Les complications (au total)

- Moins de complications mortelles.
- **Moins de pneumopathies nosocomiales.**
- Moins de sepsis sévères et de choc septique.
- Moins de défaillance d'organe.

Jusqu’où? Quand intuber?

ETUDE	MORTALITE SI ECHEC VNI
Conti ICM 1998	100%
Azoulay CCM 2001 Azoulay Medicine 2004	73 (early) Vs 93% (late)
Hilbert NEJM 2001	90-100%
Antonelli JAMA 2000	>90%



Jusqu'où?

- Les critères d'intubation sont les mêmes…
- Utilisation la plus précoce possible au cours d'épisodes débutants.
- Peu ou pas d'atteinte extra-respiratoire: choc*.
- Contre-indication formelle: troubles de la conscience**.

*Aubier et al. ARRD 1982.

**CC SRLF 2006.

organisée conjointement par
la SFAR, la SPLF et la SRLF

2006

Ventilation Non Invasive
au cours de l'insuffisance respiratoire aiguë (nouveau-né exclu)

Intérêt non établi de façon certaine Il faut probablement faire (G2+)	IRA hypoxémique de l'immunodéprimé Post-opératoire de chirurgie thoracique et abdominale
	Stratégie de sevrage de la ventilation invasive chez les BPCO Prévention d'une IRA post extubation Traumatisme thoracique fermé isolé Décompensation de maladies neuromusculaires chroniques et autres IRC restrictives Mucoviscidose décompensée *Forme apnéisante de la bronchiolite aiguë* *Laryngo-trachéomalacie*
Aucun avantage démontré Il ne faut probablement pas faire (G2-)	Pneumopathie hypoxémiante SDRA Traitement de l' IRA post-extubation

Question 1 :

3 - Critères de poursuite et d'arrêt de la VNI :

La VNI doit être interrompue en cas :

- d'amélioration soutenue du patient en dehors d'une séquence de VNI, avec régression des signes cliniques d'IRA (plus rapide dans l'OAP), oxygénation efficace, correction de l'acidose.
- de survenue d'une contre-indication
- d'intolérance
- d'inefficacité nécessitant une intubation

La VNI ne doit pas être interrompue brutalement au-delà de la phase initiale de prise en charge de l'IRC décompensée.

Azoulay et al. Medicine 2004

ETUDE PROSPECTIVE OBSERVATIONNELLE SUR 5 ANS

	All Patients (%)	Patients who Died (Hospital Mortality Rate)
No ventilatory support (high-concentration oxygen mask only)	55 (27)	5 (9)
NIMV only	34 (16.8)	5 (14.7)
NIMV followed by conventional MV (NIMV failure)	45 (22.2)	33 (73.3)
Late NIMV failure (>2 full days of NIMV)	14 (6.9)	13 (92.85)
of NIMV patients		
Duration of NIMV		
One day	25 (31.6)	14 (56)
Two days	21 (26.6)	8 (38)*
Three days	9 (11.4)	3 (33.3)*
More than 3 days	24 (30.4)	13 (54.2)
First-line conventional MV	69 (34)	54 (78.3)
Total number of conventional MV patients	**114 (56.2)**	**86 (75.4)**
admission to conventional MV		
At ICU admission	56 (49.1)	42 (75)
First 24 hours	17 (14.9)	14 (82.35)
24–48 hours	12 (10.5)	6 (50)
48–72 hours	6 (5.3)	4 (66.7)
Conventional MV after 3 days		
All patients	23 (20.2)	21 (91.3)
Noncardiac patients	19 (16.7)	19 (100)
Total	**203 (100)**	**96 (47.3)**

*$P < 0.05$ when compared with patients receiving 1 day or more than 3 days of NIMV.

TABLE 5. Predictors of Failure of Noninvasive Mechanical Ventilation (NIMV)

	Odds Ratio	95% Confidence Interval	p Value
Diagnosis of the malignancy <30 days	2.15	1.08–4.30	0.02
Pulmonary involvement by the malignancy	3.20	1.18–8.67	0.02
Symptom duration at ARF onset (per additional day)	0.93	0.87–0.99	0.04
ARDS	3.08	1.45–6.61	0.003
Steroid therapy	2.39	1.21–4.70	0.001
Duration of NIMV (per additional day)	1.44	1.22–1.69	<0.0001
No definite etiologic diagnosis of the ARF	2.43	1.02–2.79	0.04
Need for vasopressors	3.20	1.54–6.65	0.001

« NIMV may have a deleterious impact by delaying conventional MV in patients with ARDS»

Conclusion (4)

- **La VNI chez les POH a permis clairement d'améliorer le pronostic de ces patients en IRA.**
- **Elle n'est pas dénuée de complications. Moins de complications…**
- **La connaissance des contre-indications et le choix du moment du recours à la ventilation invasive est fondamental.**

Consider saying yes*

Jeffrey S. Groeger, MD
Peter B. Bach, MD, MAPP
Memorial Sloan-Kettering
Cancer Center
New York, NY

Crit Care Med 2003 Vol. 31, No. 1

MERCI