Société de Réanimation de Langue Française

ASSOCIATION TUNISIENNE DE REANIMATION
ATR

5è Congrès Francophone de Réanimation

&

17è Congrès de l'ATR

- L'Association Tunisienne de Réanimation
- La Société de Réanimation de Langue Française
- La Société Libanaise de Réanimation
- La Société Algérienne d'Anesthésie-Réanimation, de Soins Intensifs et des Urgences
- L'Association Marocaine d'Urgence et de Réanimation

LE SEVRAGE DIFFICILE D'ORIGINE CARDIAQUE

Fekri Abroug

CHU F.Bourguiba

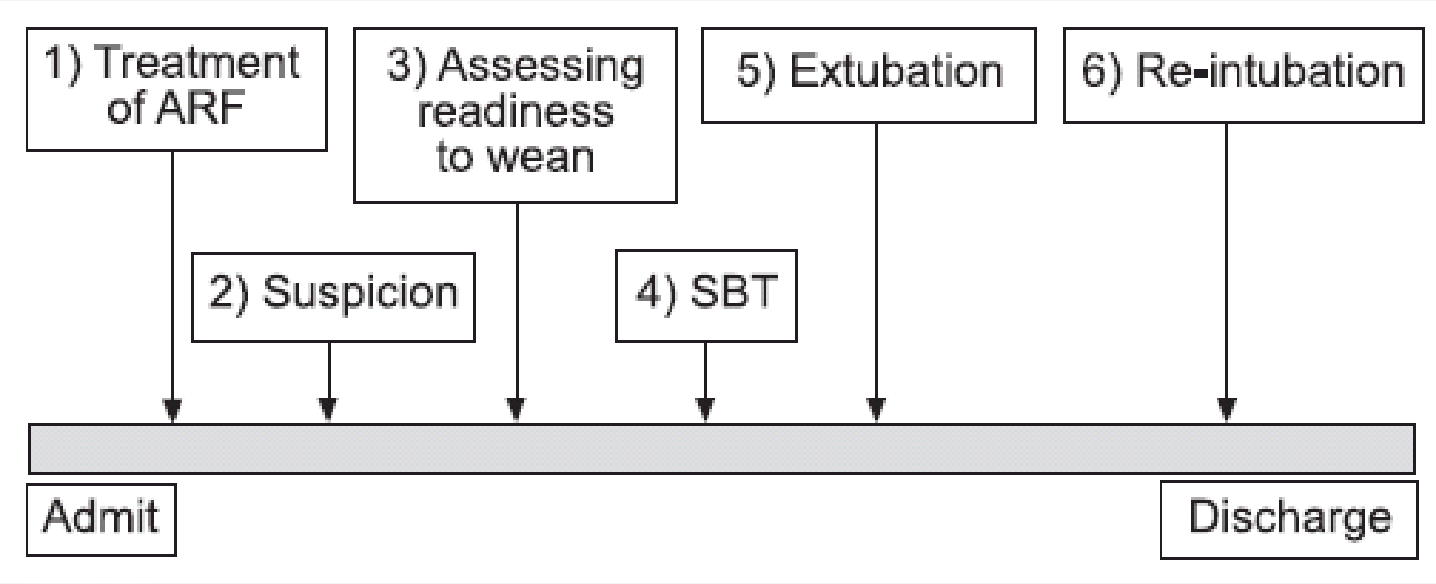
Monastir.Tunisie

كلية الطب بالمنستير
FACULTÉ DE Médecine DE MONASTIR

Outline

- Classification du sevrage
- Mécanismes des difficultés de sevrage
- Le sevrage difficile d'origine cardiaque
- Fréquence
- Diagnostic
- Traitement

De la VM au sevrage

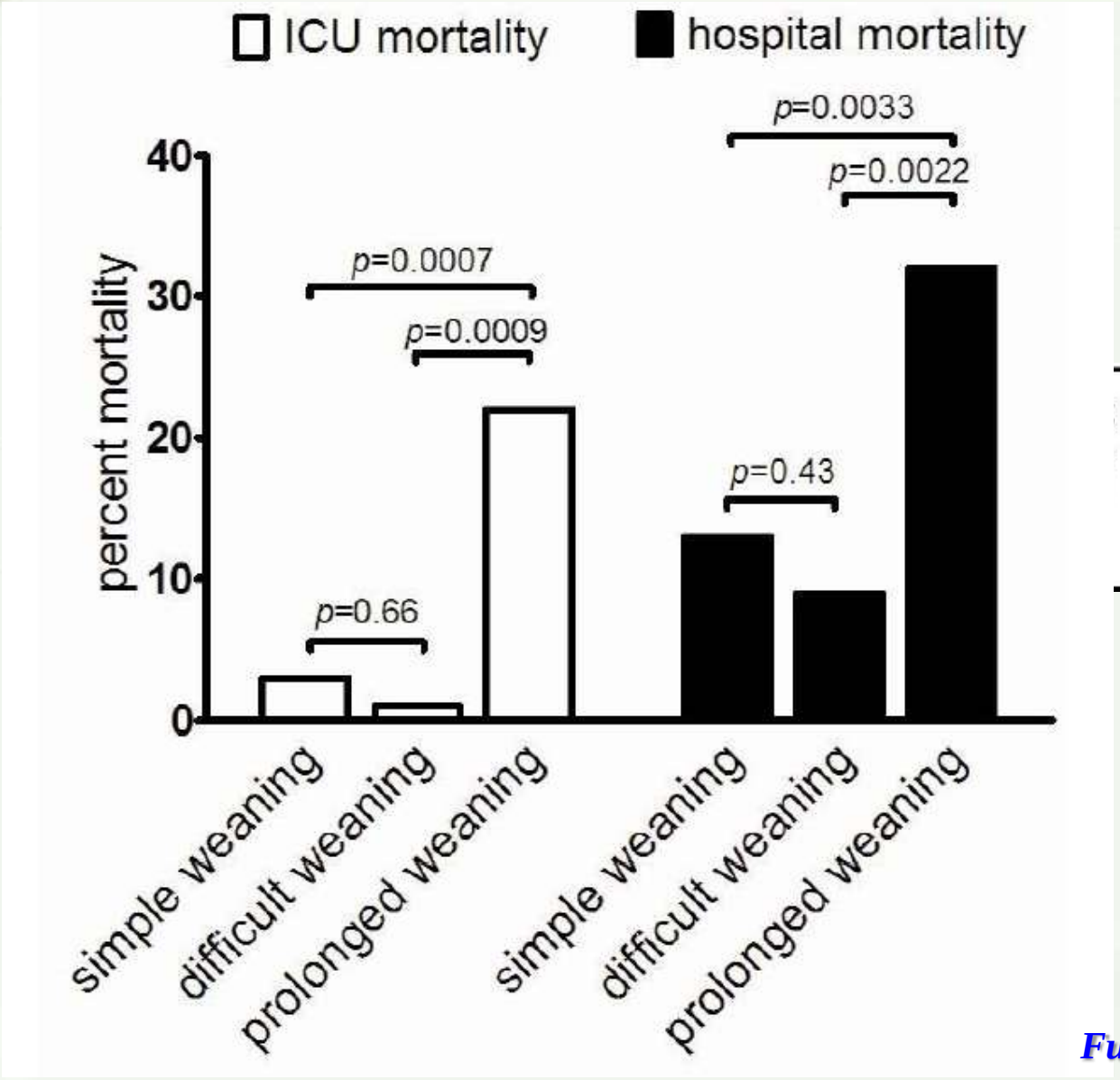


Group/category
Simple weaning
Difficult weaning
Prolonged weaning

Sevrage : 3 groupes

- **1) Sevrage Simple (premier)**
  - 70-75% des patients
  - Détection précoce
- **2) Sevrage difficile (plus d'un essai, < 1 semaine)**
  - 20% des patients
- **3) Sevrage prolongé (plus d'1semaine)**
  - 5-10% des patients

Boles JM. ERJ 2007



Funk ERJ 2009

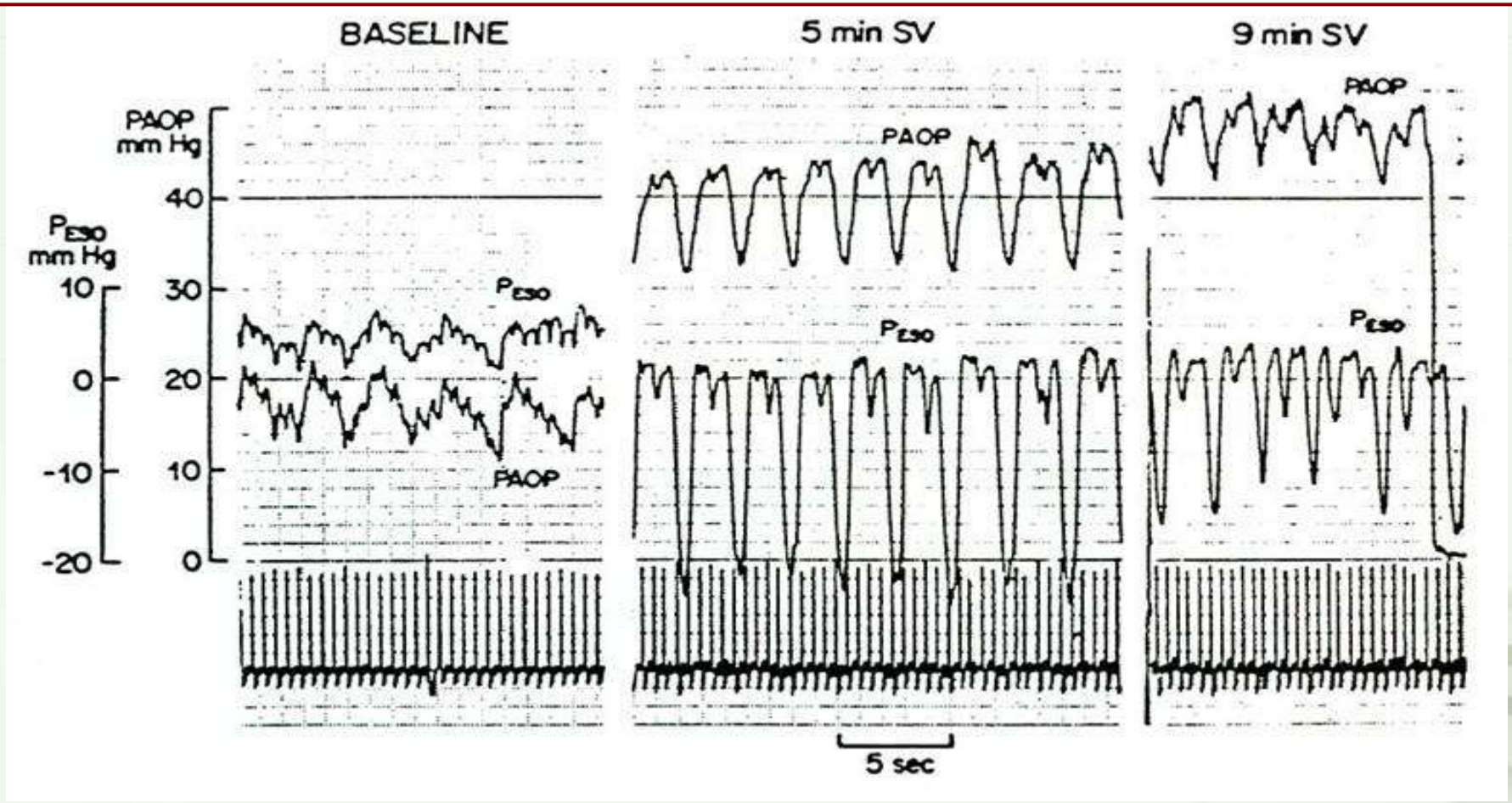
Mécanismes des difficultés de sevrage

- Sevrage possible mais non identifié
- Surcharge hydrosodée
- Faiblesse des muscles respiratoires
- Pathologie cardiaque sous jacente

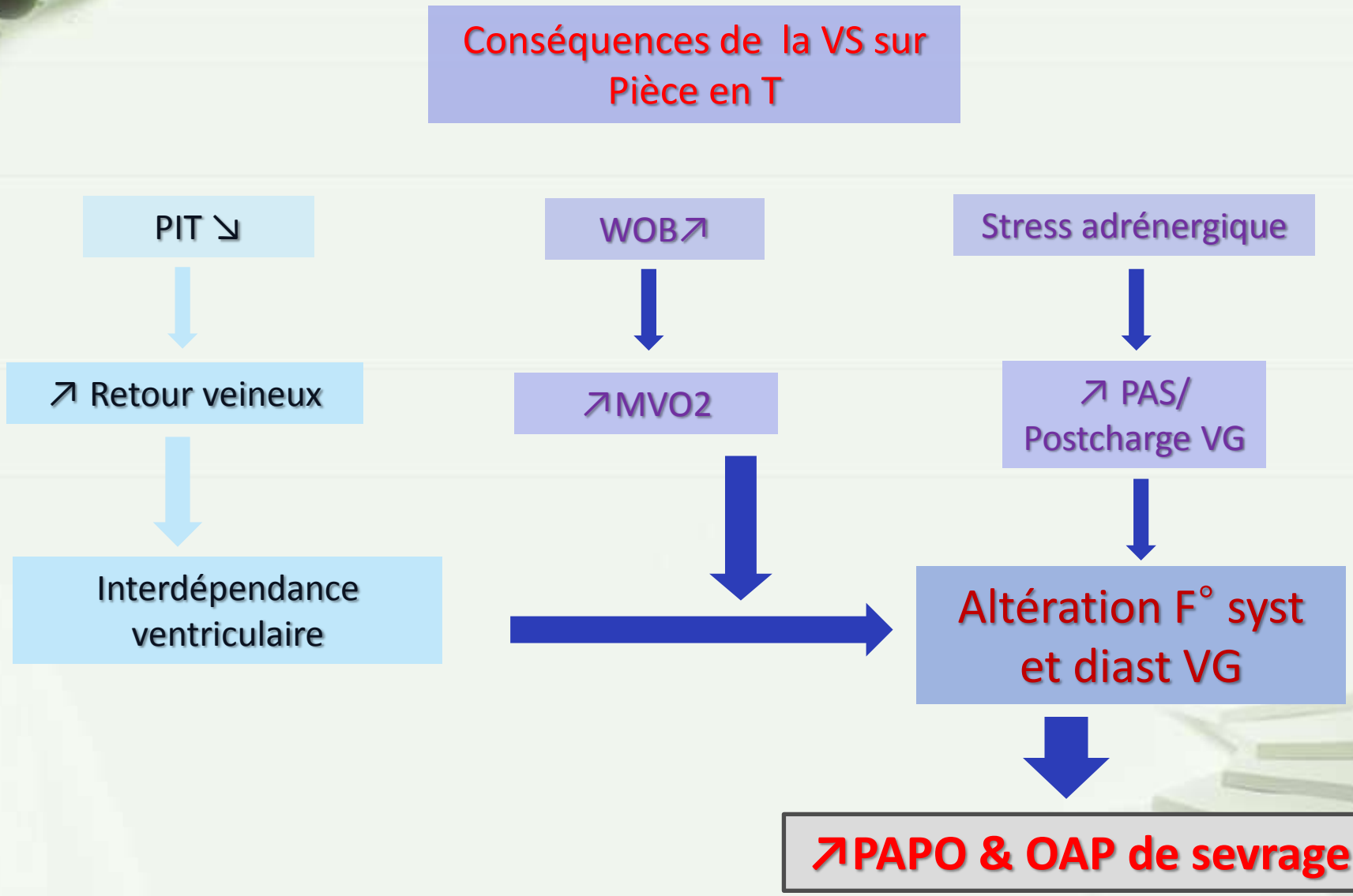
Anesthesiology
69:171–179, 1988

Acute Left Ventricular Dysfunction during Unsuccessful Weaning from Mechanical Ventilation

Francois Lemaire, M.D., Jean-Louis Teboul, M.D.,† Luc Cinotti, M.D.,‡ Guillen Giotto, M.D.,§*



La dysfonction VG aigue au cours du sevrage de la VM: Mécanismes



La dysfonction VG aigue au cours du sevrage de la VM: Fréquence

RESEARCH Open Access

Nitroglycerin can facilitate weaning of difficult-to-wean chronic obstructive pulmonary disease patients: a prospective interventional non-randomized study

CRITICAL CARE 2010, 14:R204

Christina Routsi[1*], Ioannis Stanopoulos[2], Epaminondas Zakynthinos[1], Panagiotis Politis[1], Vassilios Papas[1], Demetrios Zervakis[1], Spyros Zakynthinos[1]

Weaning difficult-to-wean chronic obstructive pulmonary disease patients: A pilot study comparing initial hemodynamic effects of levosimendan and dobutamine

Lamia Ouanes-Besbes[a], Islem Ouanes[a], Fahmi Dachraoui[a], Saoussen Dimassi[a], Alexandre Mebazaa[b], Fekri Abroug MD[a,*]

Journal of Critical Care (2010)

In COPD

	Weaning Difficulties	Cardiac Origin
	42%	54%
	36%	43%

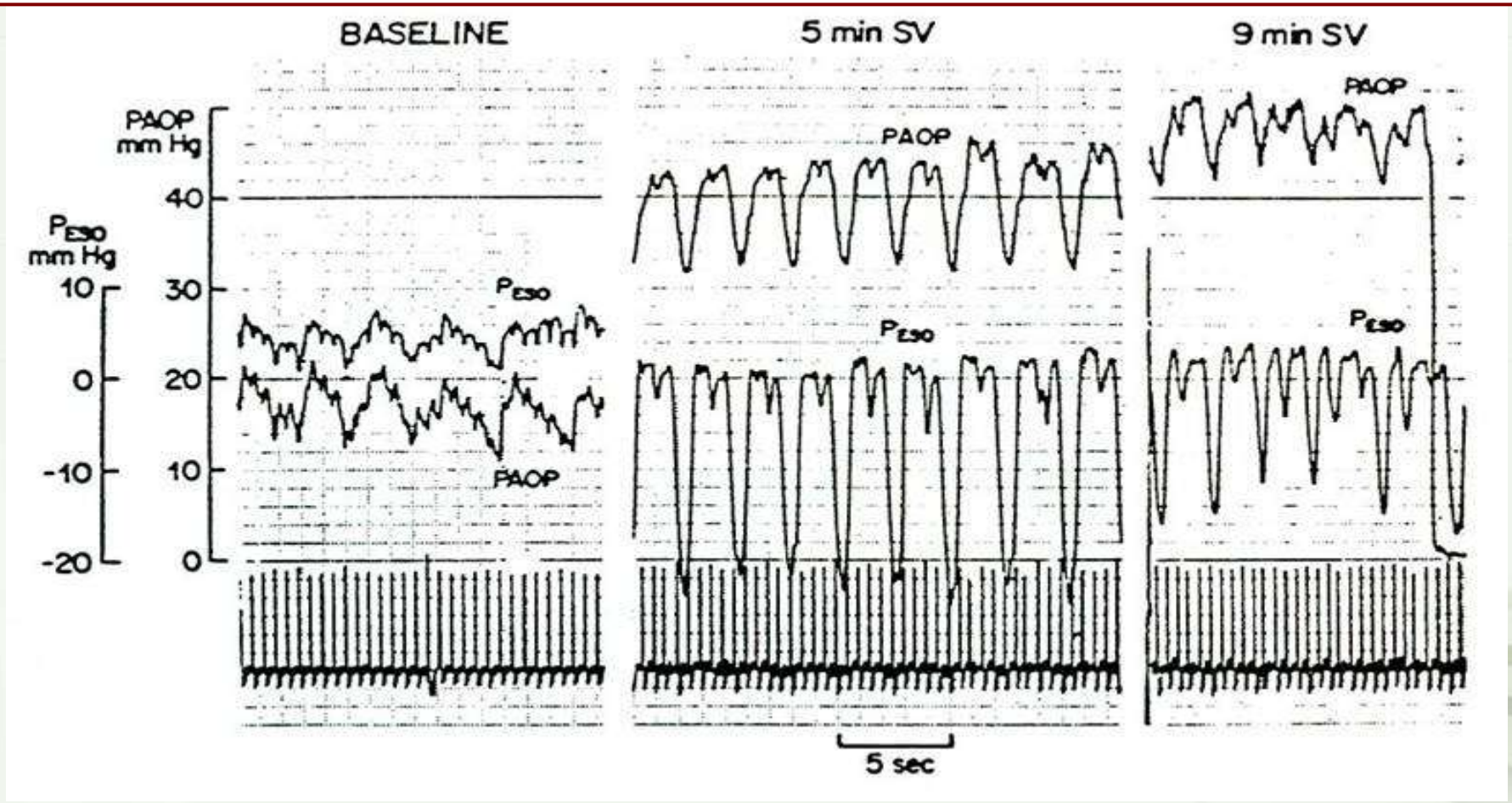
Diagnostic du sevrage difficile d'origine cardiaque

- **Gold standard: Cathéter Artériel Pulmonaire (augmentation de la PAOP ou baisse de la SvO2)**
- **Moins invasif:**
  - **Augmentation de la PAS**
  - **Indicateurs échocardiagraphiques de la PAOP**
  - **Indicateurs biologiques:**
    - B-type natriuretic peptides
    - Indicateurs biologiques de l'hemoconcentration (protidemie, hematocrite)

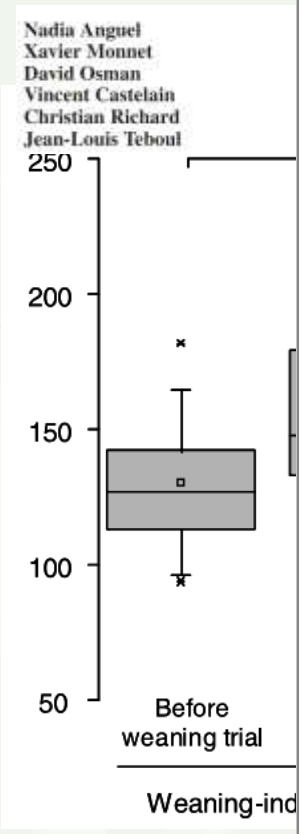
Anesthesiology
69:171–179, 1988

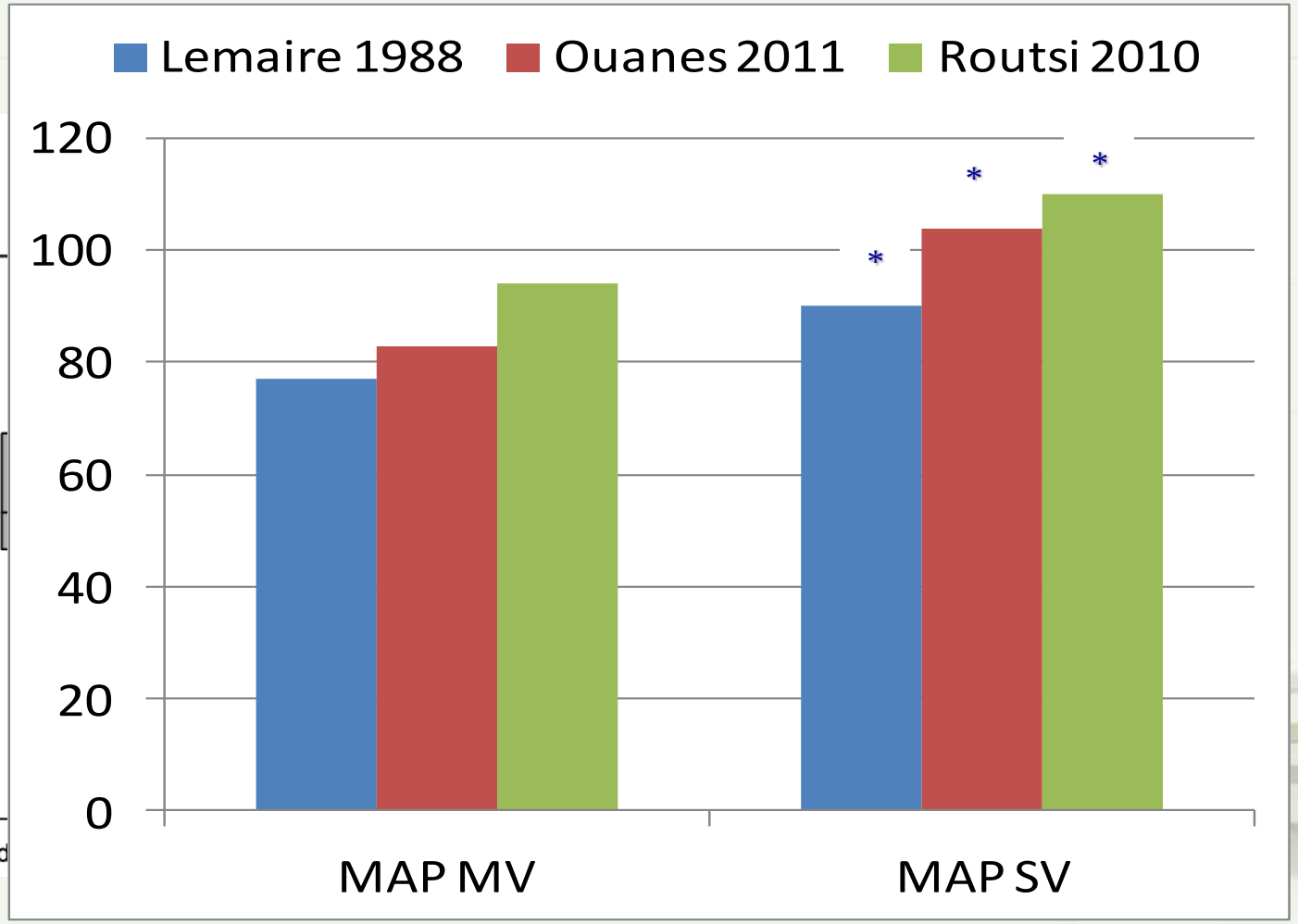
Acute Left Ventricular Dysfunction during Unsuccessful Weaning from Mechanical Ventilation

Francois Lemaire, M.D., Jean-Louis Teboul, M.D.,† Luc Cinotti, M.D.,‡ Guillen Giotto, M.D.,§*



Variation de la PAS en cas de difficultés de sevrage d'origine cardiaque





Echocardiographic diagnosis of pulmonary artery occlusion pressure elevation during weaning from mechanical ventilation*

Bouchra Lamia, MD, MPH, PhD; Julien Maizel, MD; Ana Ochagavia, MD; Denis Chemla, MD, PhD; David Osman, MD; Christian Richard, MD; Jean-Louis Teboul, MD, PhD

Crit Care Med 2009; 37:1696–1701

Cut-off: E/A > 0.95

&E/Ea > 8.5

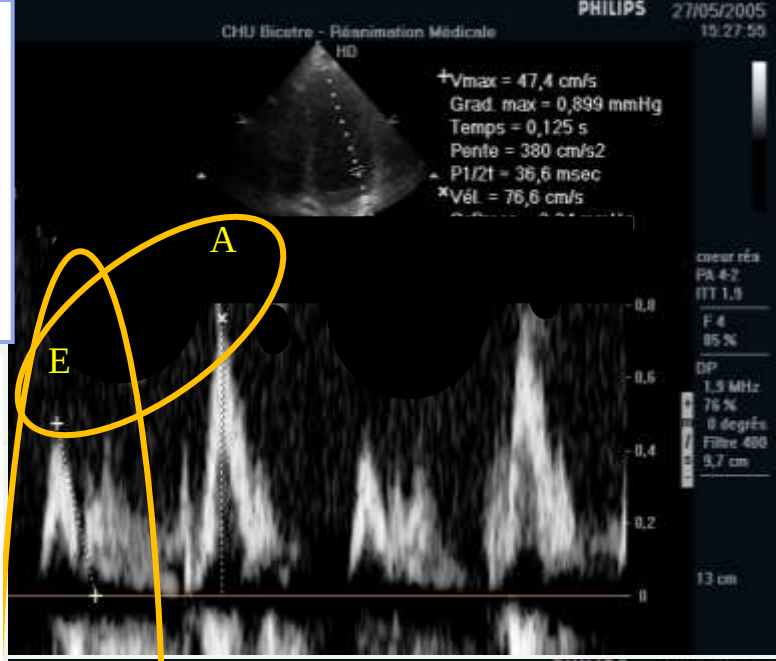
At the end of SBT

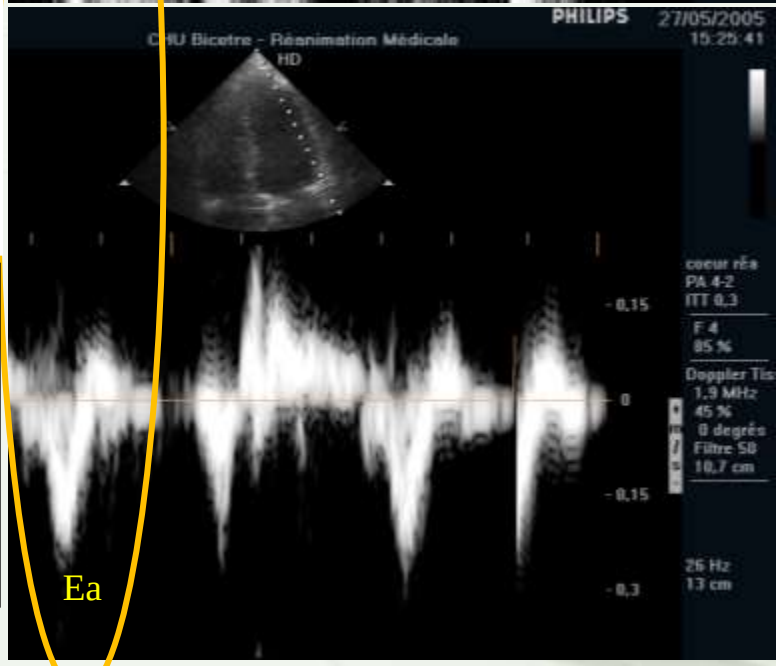
Se = 82%

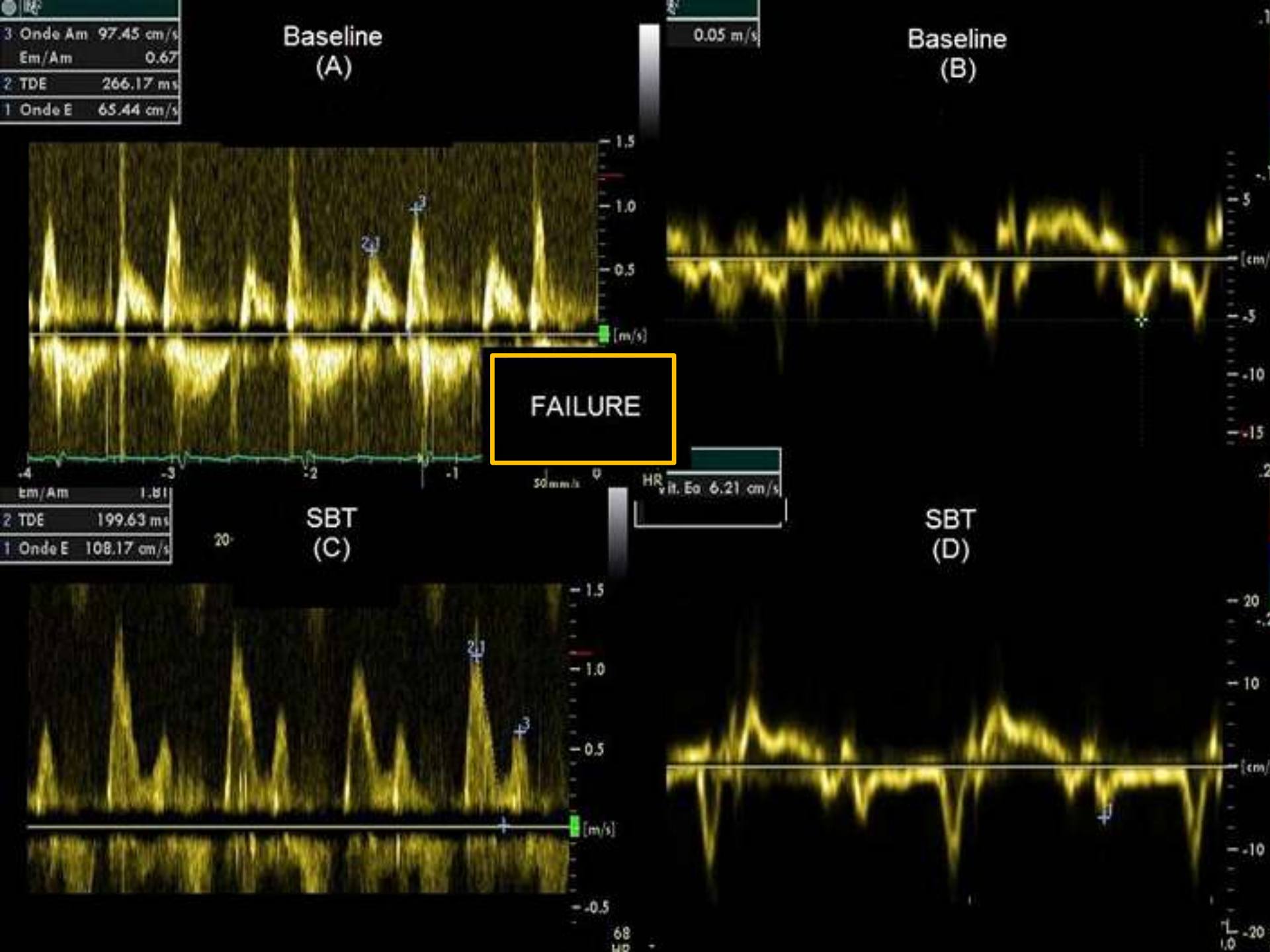
Sp = 91%

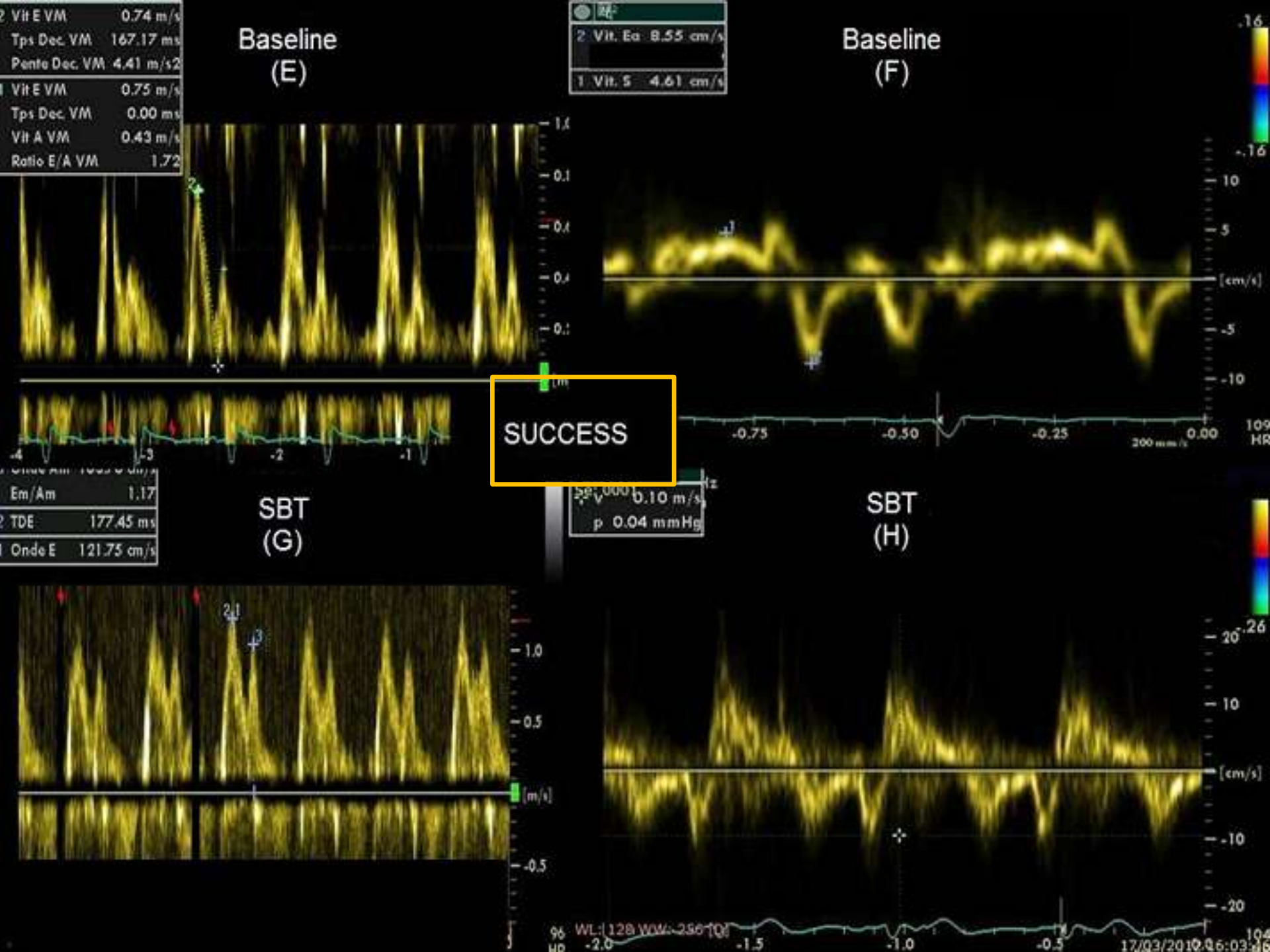
PPV = 88%

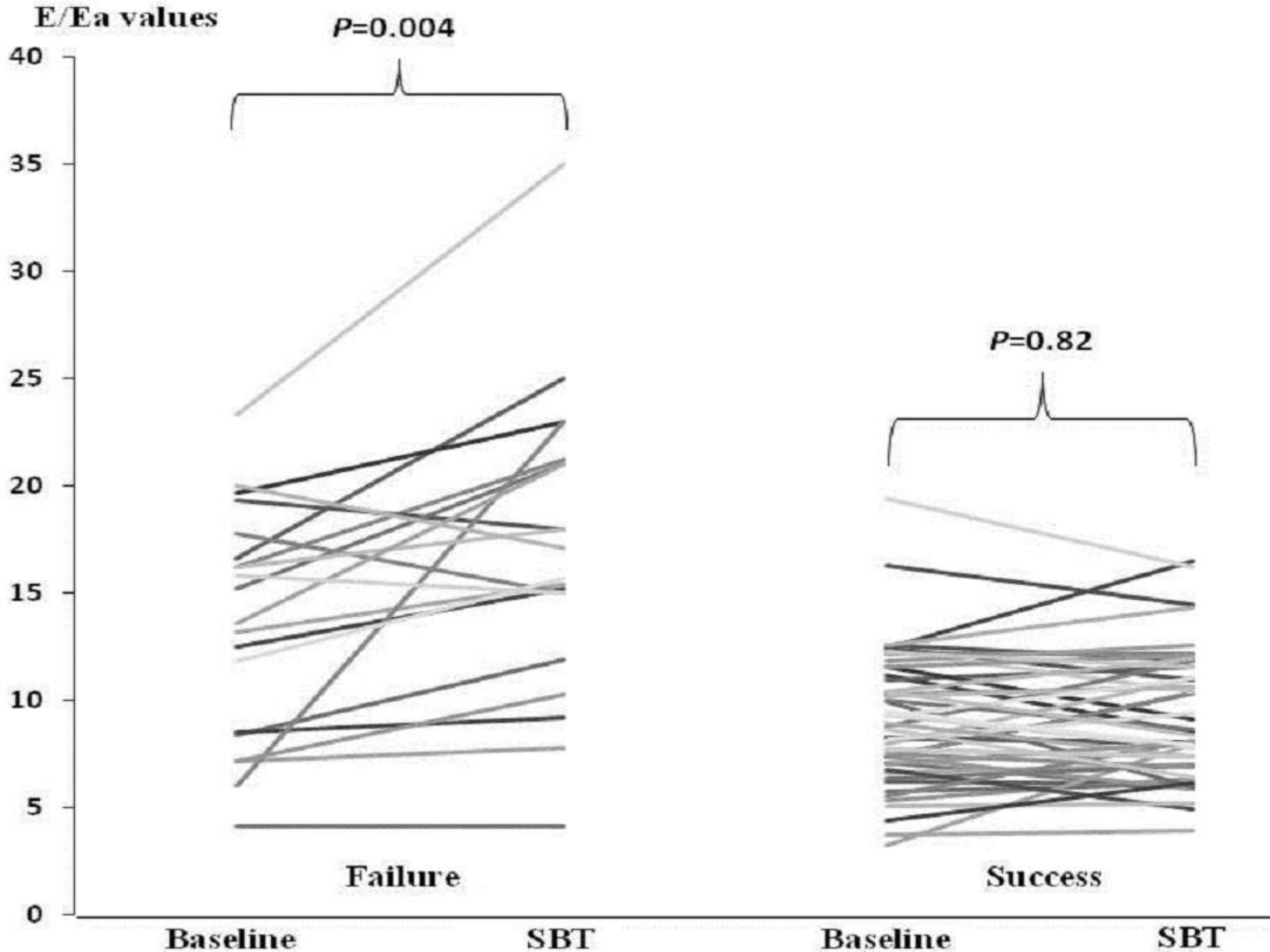
NPV = 87%

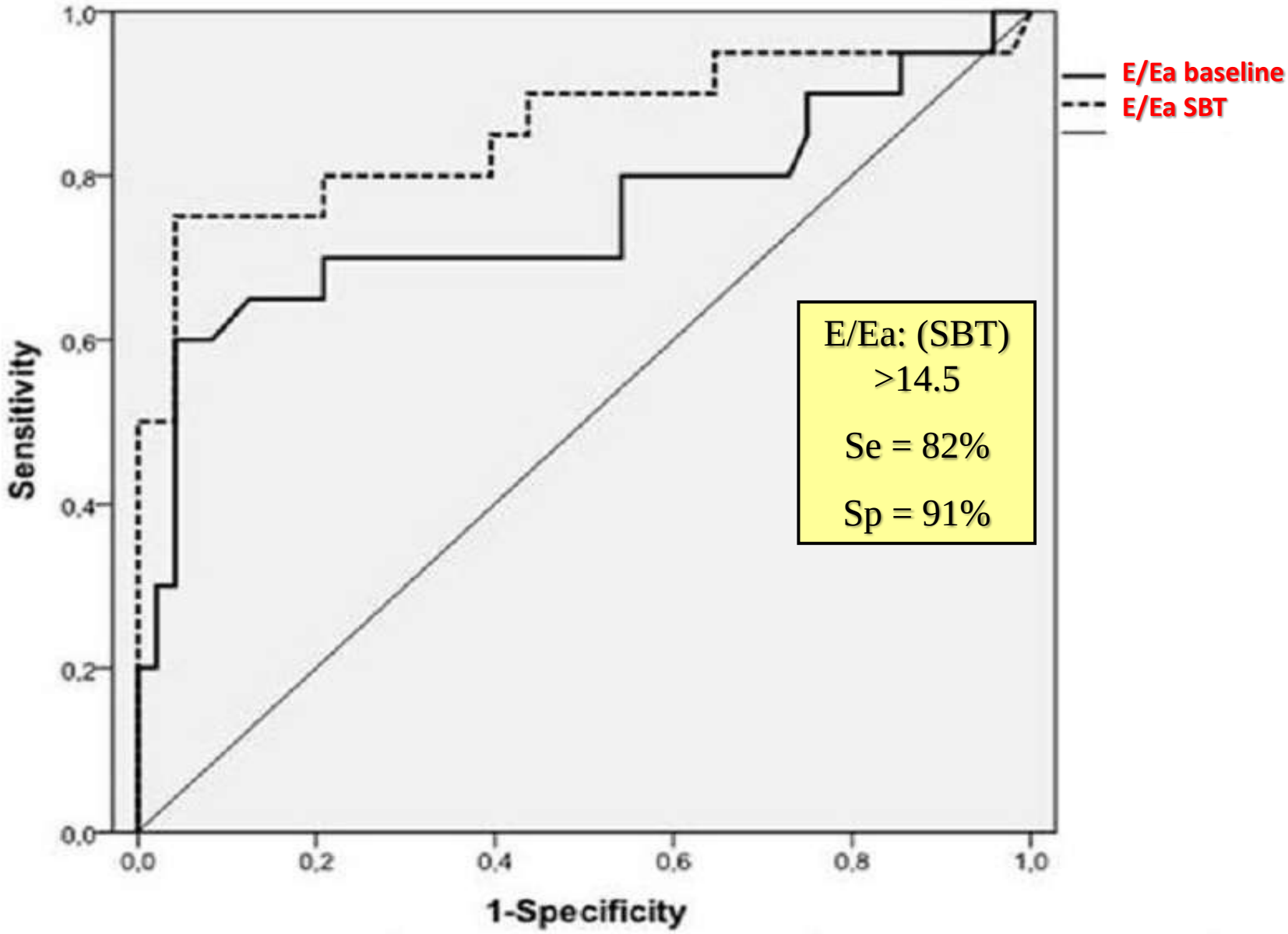





3 Onde Am 97.45 cm/s
Em/Am 0.67
2 TDE 266.17 ms
1 Onde E 65.44 cm/s
Baseline
(A)
0.05 m/s
Baseline
(B)
FAILURE
Em/Am 1.81
2 TDE 199.63 ms
1 Onde E 108.17 cm/s
SBT
(C)
HR
Vit. Eo 6.21 cm/s
SBT
(D)

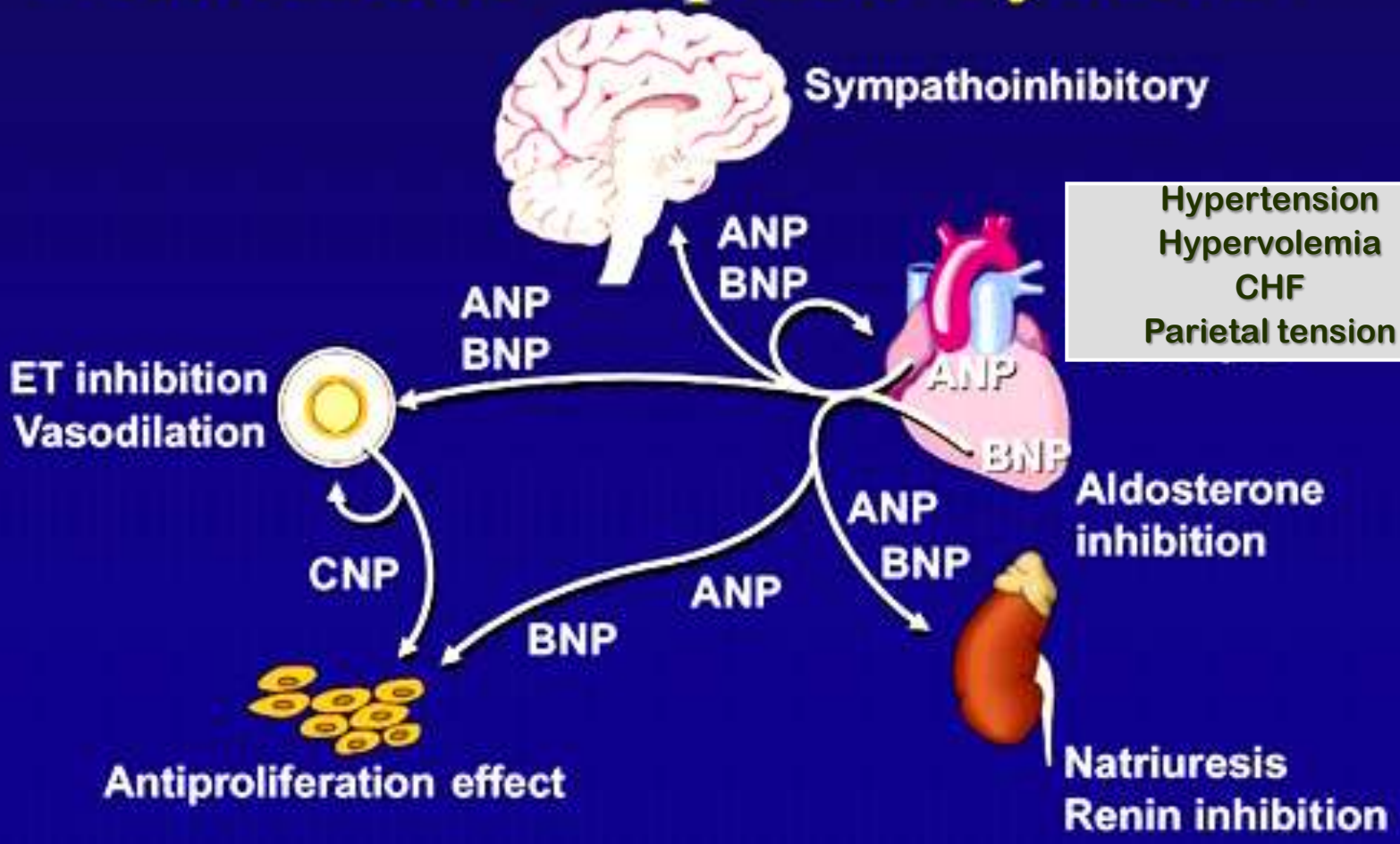

Vit E VM 0.74 m/s
Tps Dec. VM 167.17 ms
Pente Dec. VM 4.41 m/s2
Vit E VM 0.75 m/s
Tps Dec. VM 0.00 ms
Vit A VM 0.43 m/s
Ratio E/A VM 1.72
Baseline
(E)
2 Vit. Ea 8.55 cm/s
1 Vit. S 4.61 cm/s
Baseline
(F)
SUCCESS
Em/Am 1.17
TDE 177.45 ms
Onde E 121.75 cm/s
SBT
(G)
0.10 m/s
p 0.04 mmHg
SBT
(H)
[cm/s]
[m/s]


E/Ea values
P=0.004
40
35
30
25
20
15
10
5
0
P=0.82
Failure
Success
Baseline
SBT
Baseline
SBT



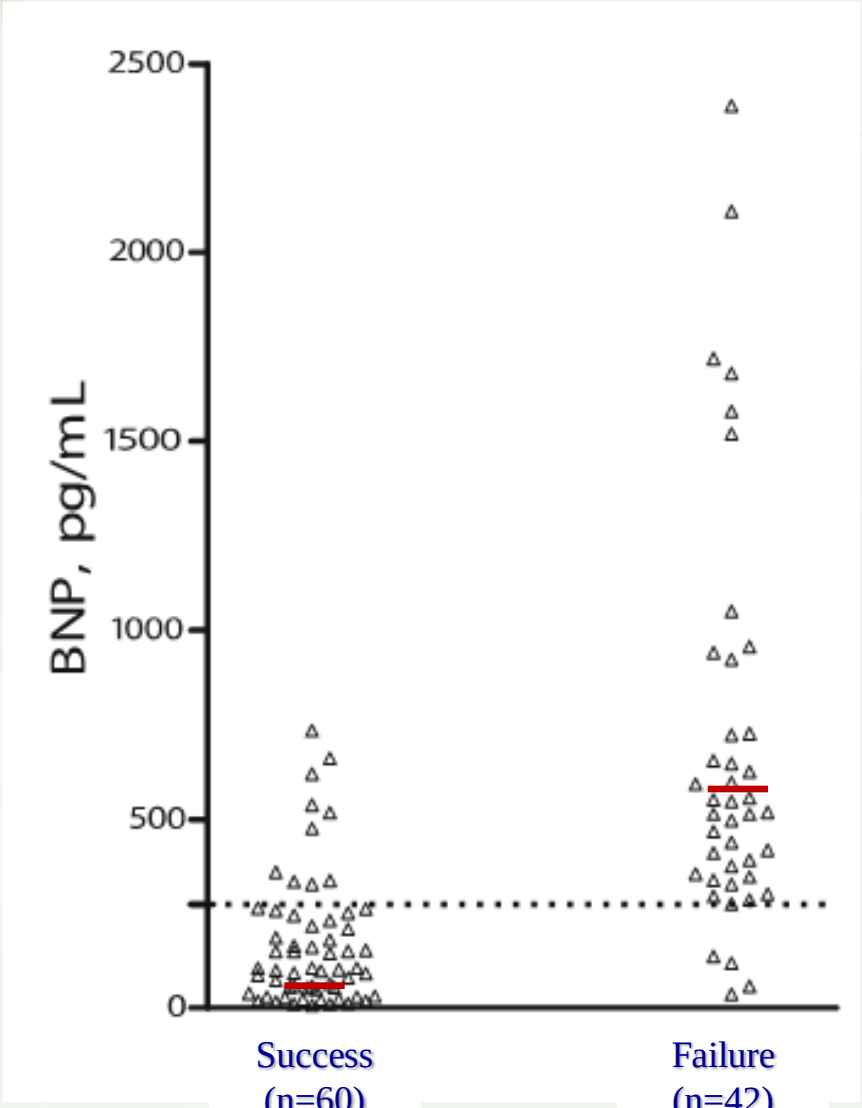
Test	AUC	Standard Error	p
E/Ea Baseline	0.75	0.07	0.001
E/Ea SBT	0.86	0.06	<0.001

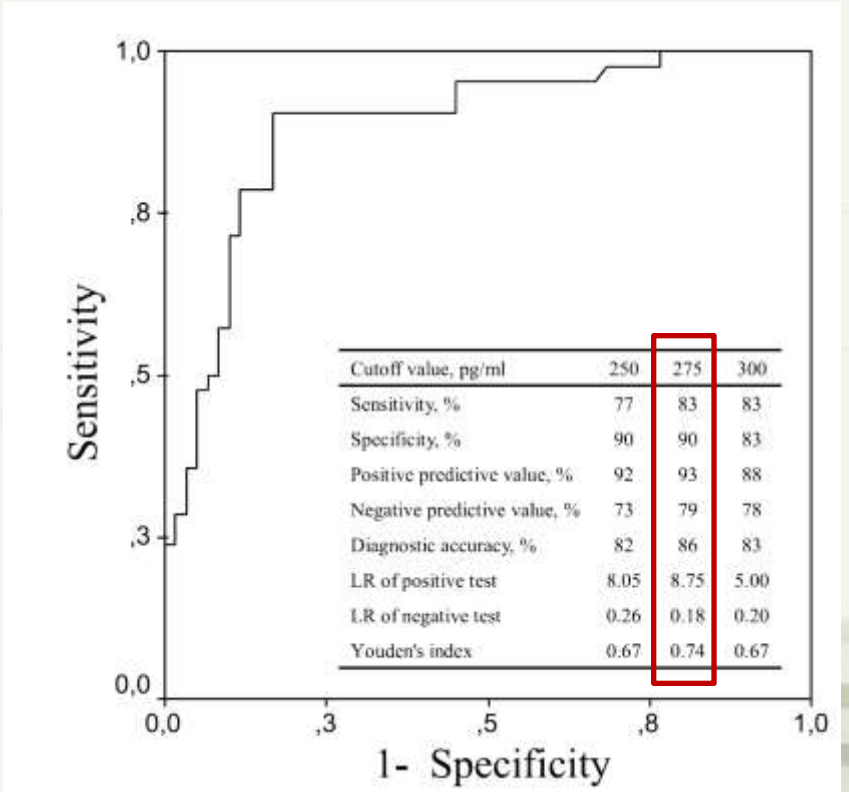
Natriuretic Peptide System



Burnett JC Jr. *J Hypertens.* 1999;17(suppl 1):S37—S43.

Baseline BNP pour la prédiction du devenir du sevrage

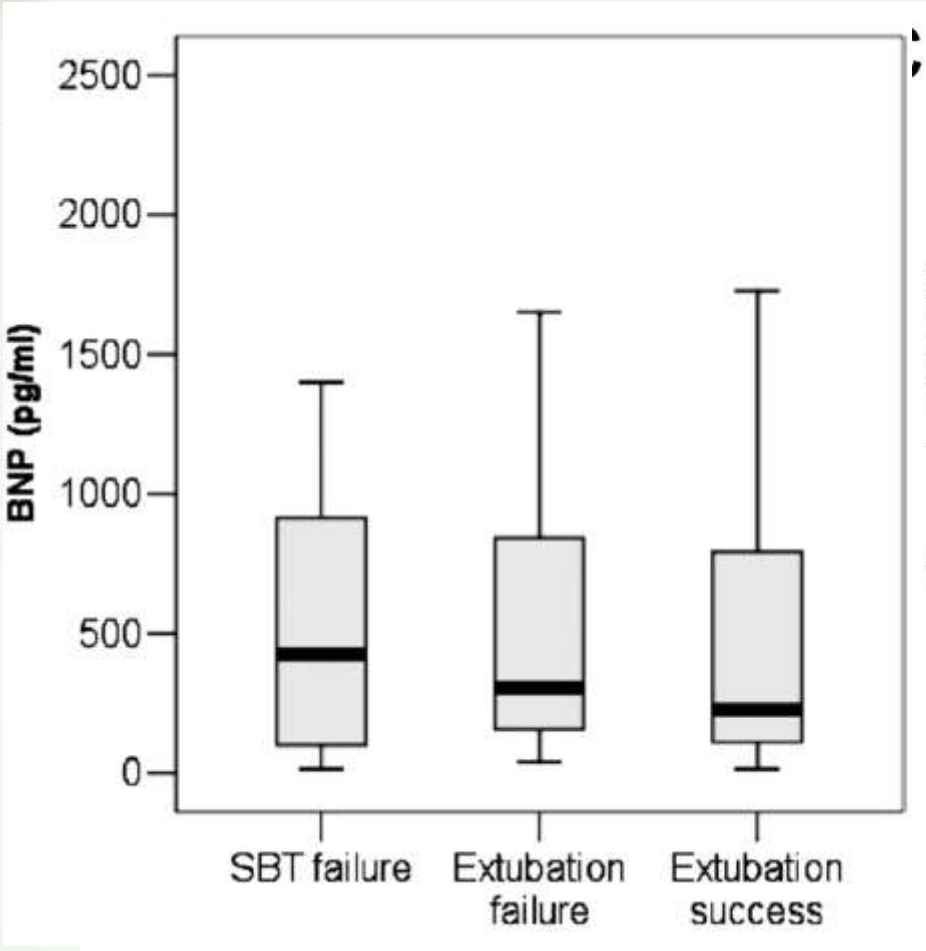


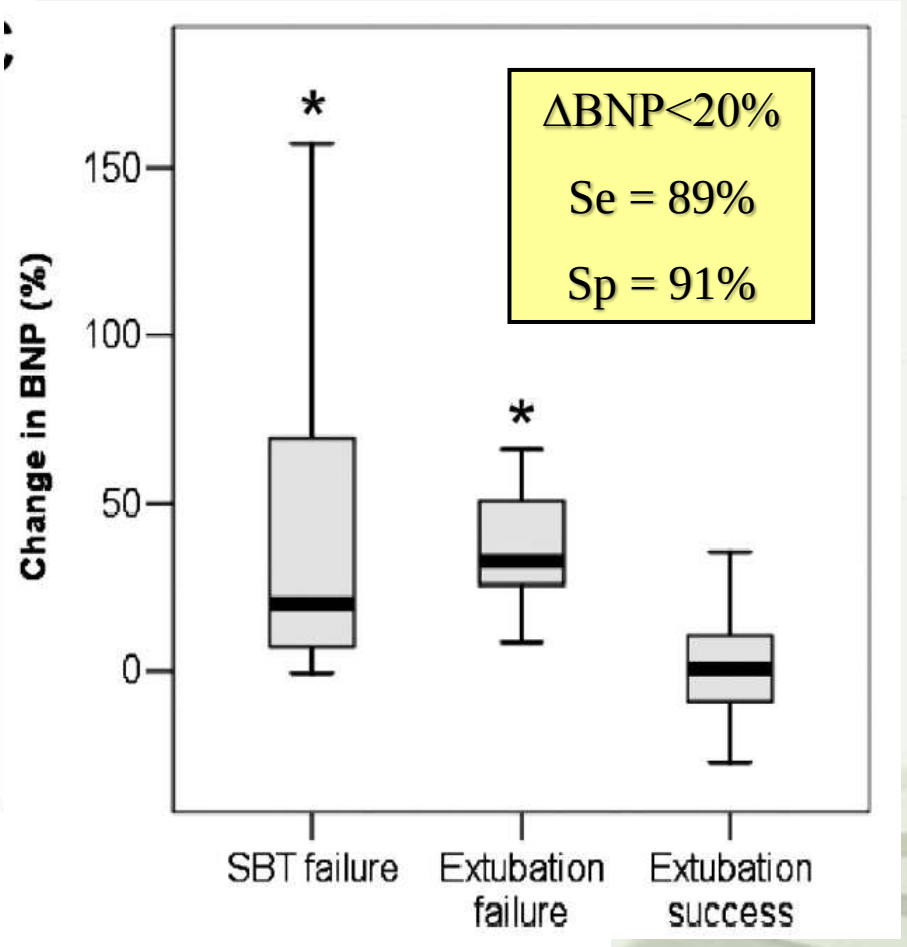


Cutoff value, pg/ml	250	275	300
Sensitivity, %	77	83	83
Specificity, %	90	90	83
Positive predictive value, %	92	93	88
Negative predictive value, %	73	79	78
Diagnostic accuracy, %	82	86	83
LR of positive test	8.05	8.75	5.00
LR of negative test	0.26	0.18	0.20
Youden's index	0.67	0.74	0.67

Mekontso Dessap et al, ICM 2006

BNP (valeur unique & variation) dans le diagnostic de l'échec de sevrage





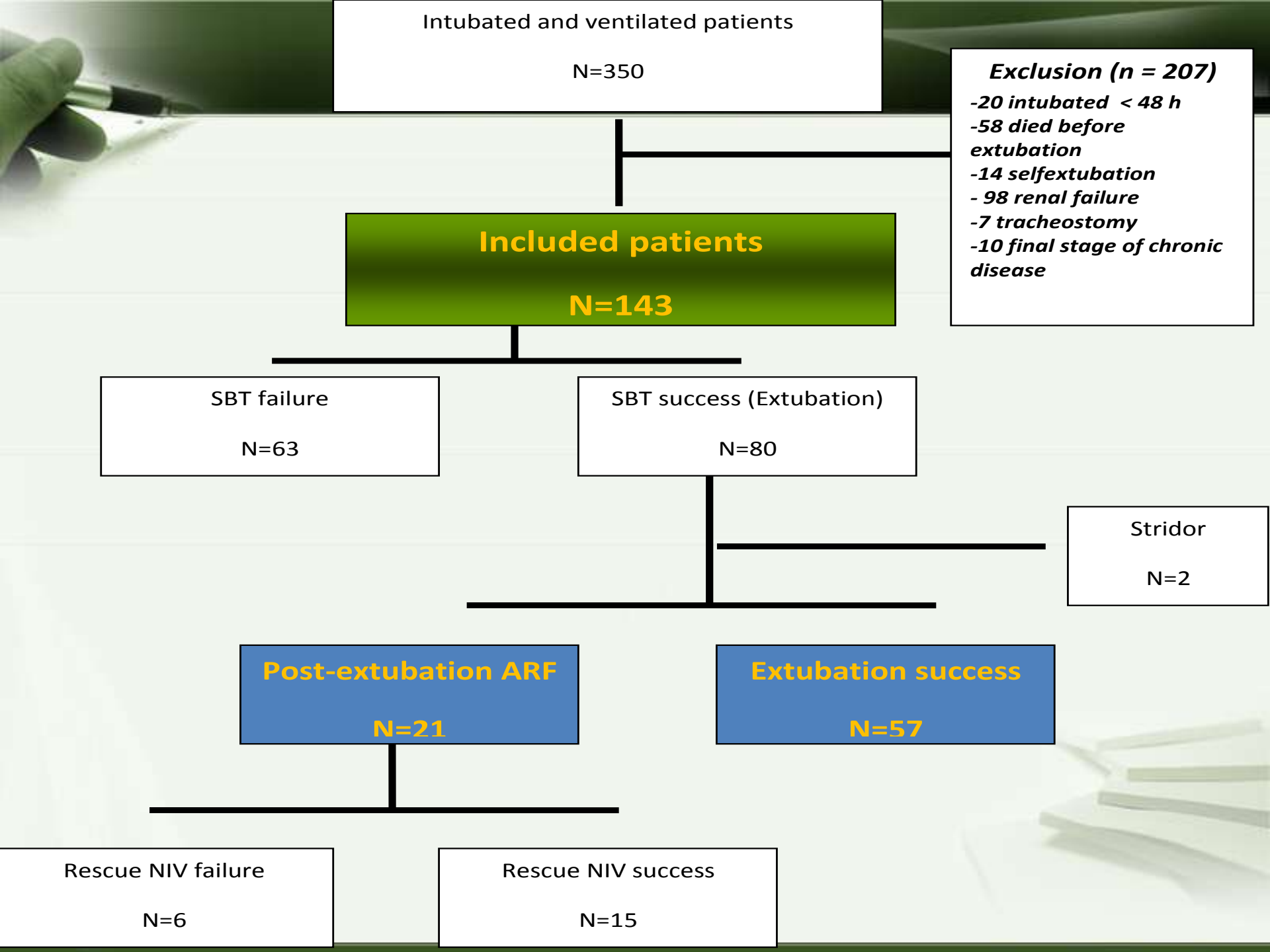
Chien et al, CCM 2008

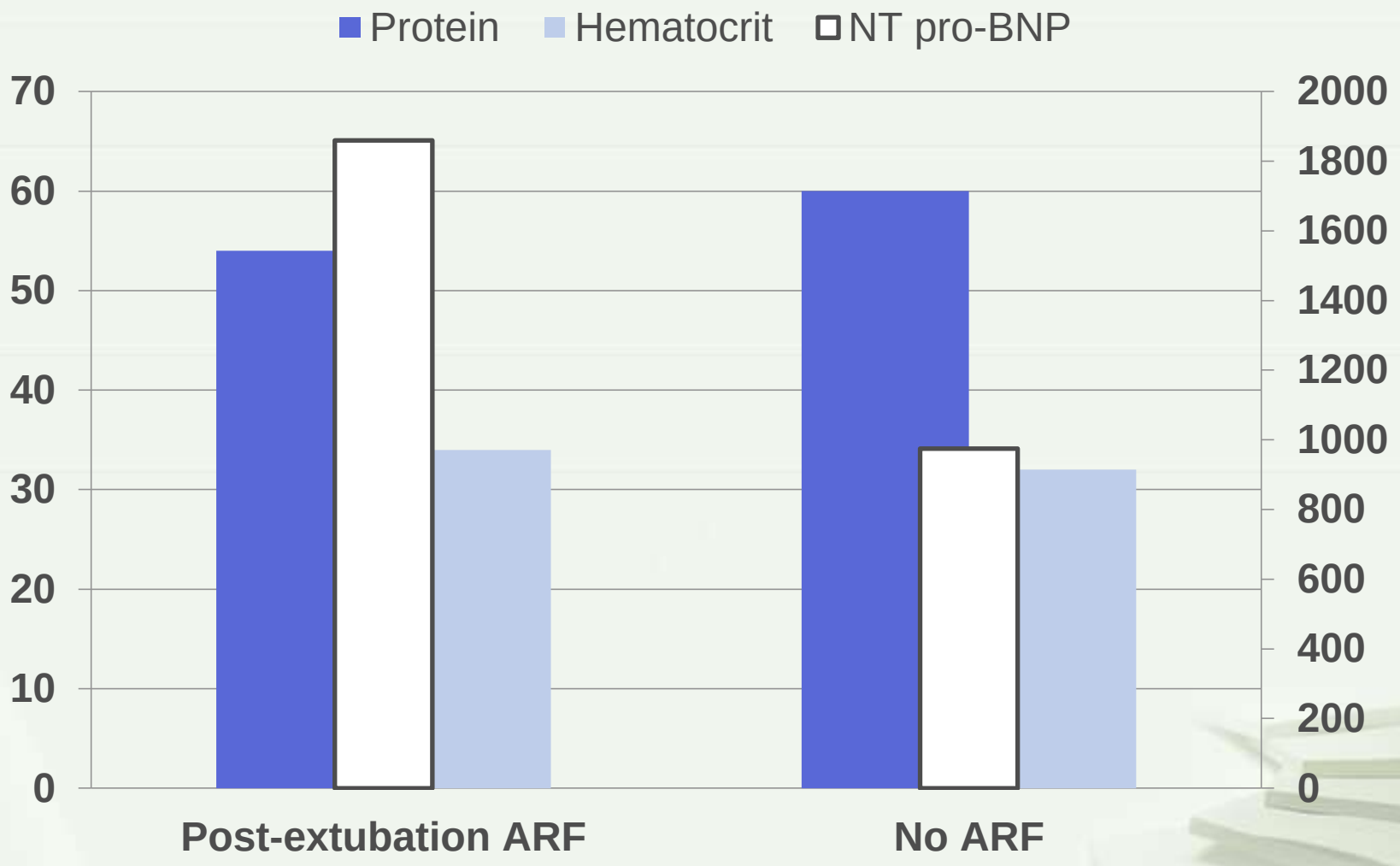
BNP to predict post-extubation ARF

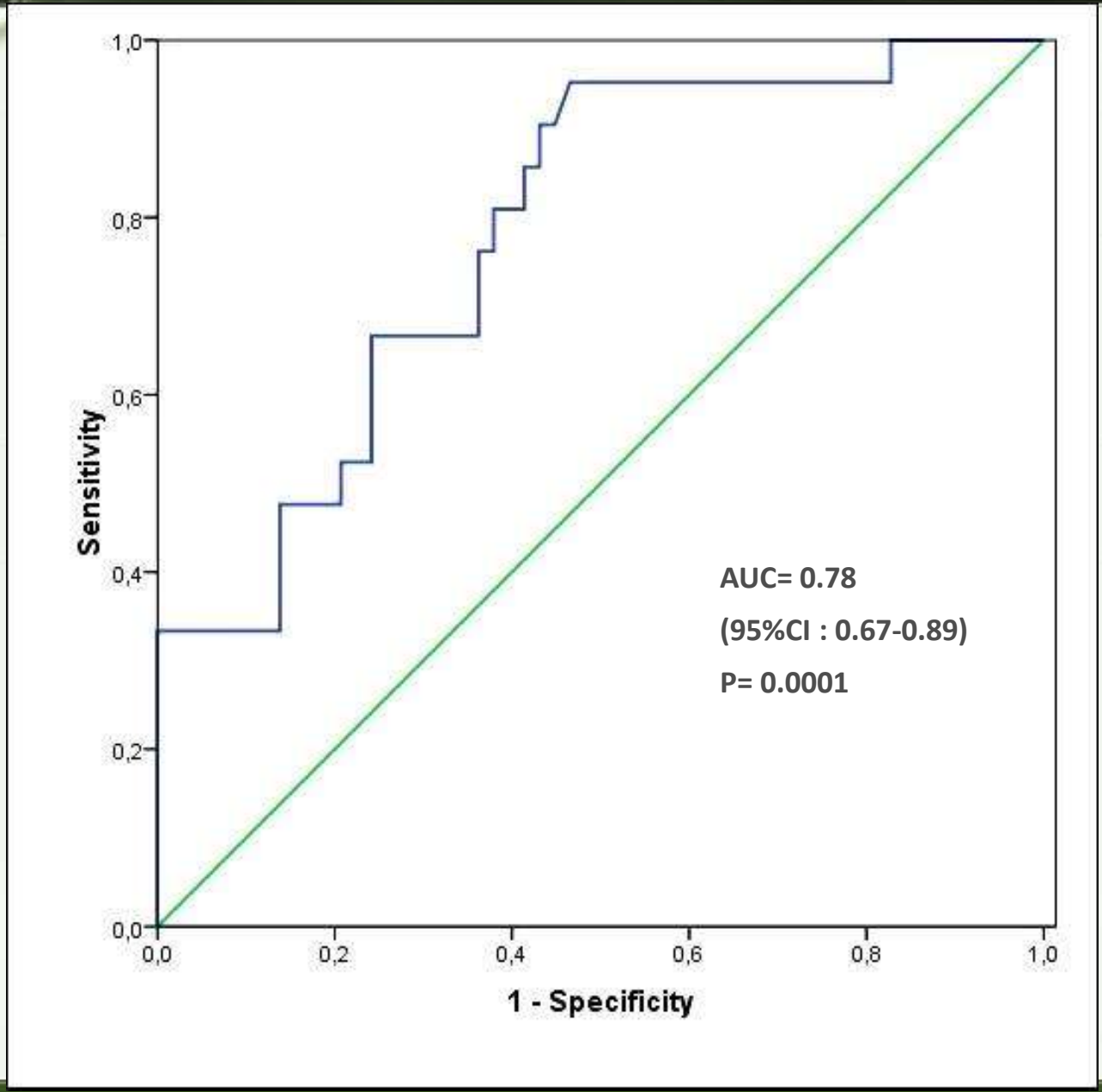
Lamia Ouanes-Besbes
Fahmi Dachraoui
Islem Ouanes
Rania Bouneb
Faten Jalloul
Mohamed Dlala
Mohamed Fadhel Najjar
Fekri Abroug

NT-proBNP levels at spontaneous breathing trial help in the prediction of post-extubation respiratory distress

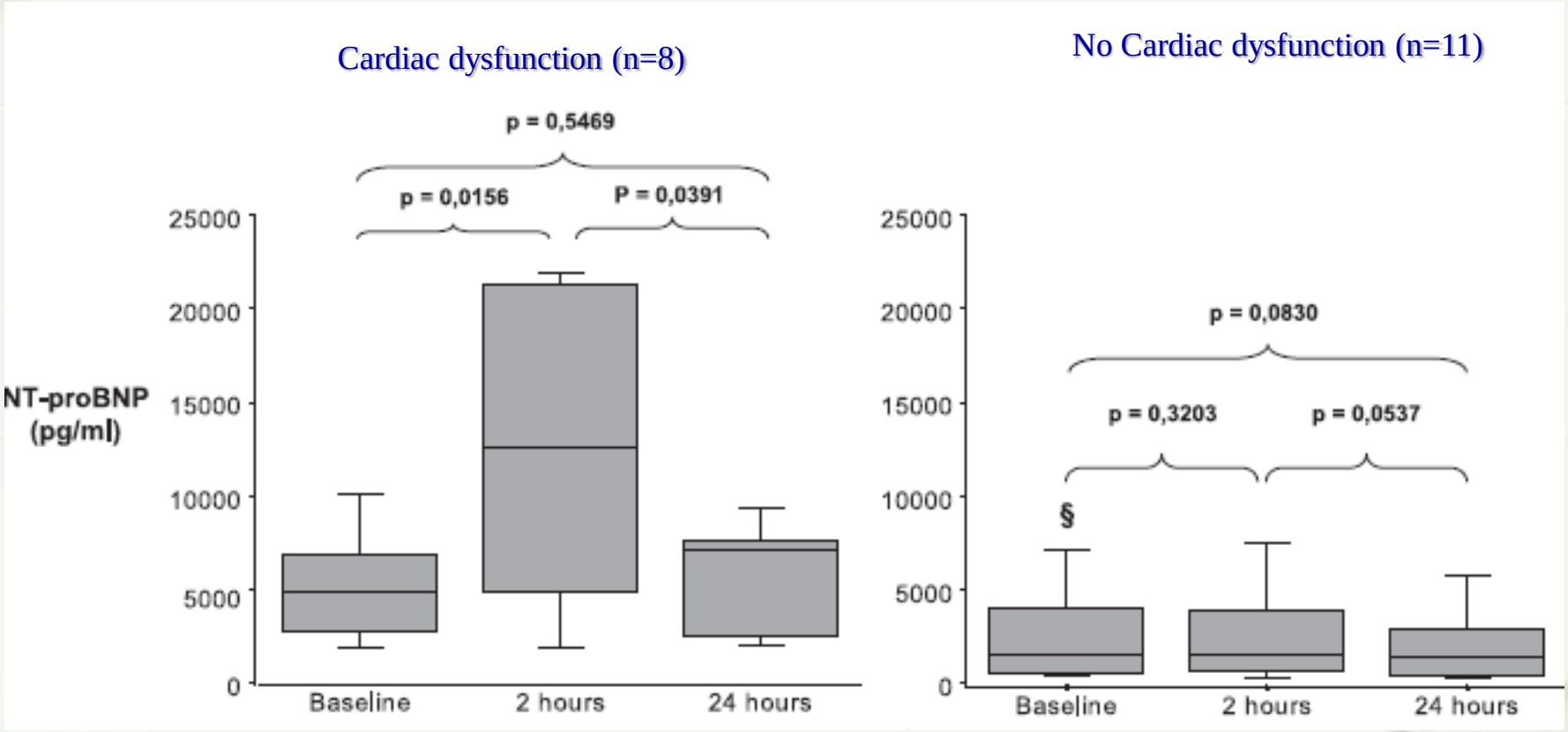
Intensive Care Med (2012) 38:788–795


Intubated and ventilated patients
N=350
Exclusion (n = 207)
-20 intubated < 48 h
-58 died before extubation
-14 selfextubation
- 98 renal failure
-7 tracheostomy
-10 final stage of chronic disease
Included patients
N=143
SBT failure
N=63
SBT success (Extubation)
N=80
Stridor
N=2
Post-extubation ARF
N=21
Extubation success
N=57
Rescue NIV failure
N=6
Rescue NIV success
N=15


Protein
Hematocrit
NT pro-BNP
70
60
50
40
30
20
10
0
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Post-extubation ARF
No ARF

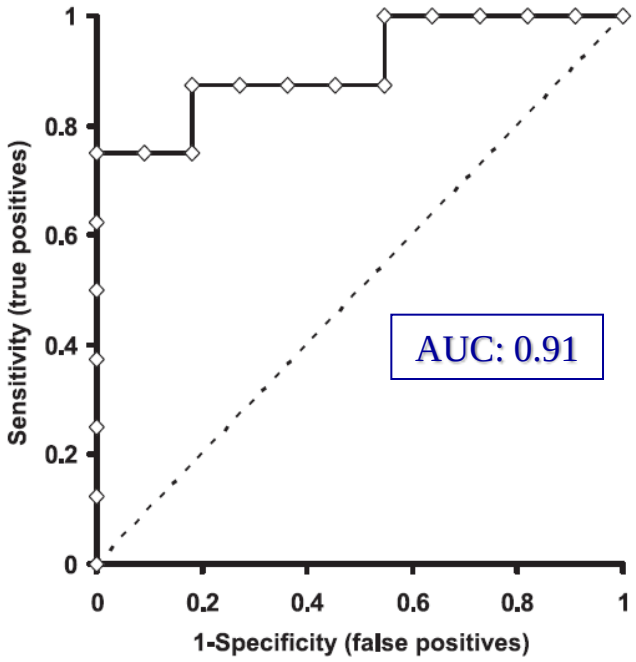

1,0
0,8
0,6
0,4
0,2
0,0
Sensitivity
0,0
0,2
0,4
0,6
0,8
1,0
1 - Specificity
AUC= 0.78
(95%CI : 0.67-0.89)
P= 0.0001

Variation du NT-PRO BNP dans le diagnostic de l'échec de sevrage d'origine cardiaque



Grasso et al, CCM 2007

Variation du NT-PRO BNP dans le diagnostic de l'échec de sevrage d'origine cardiaque

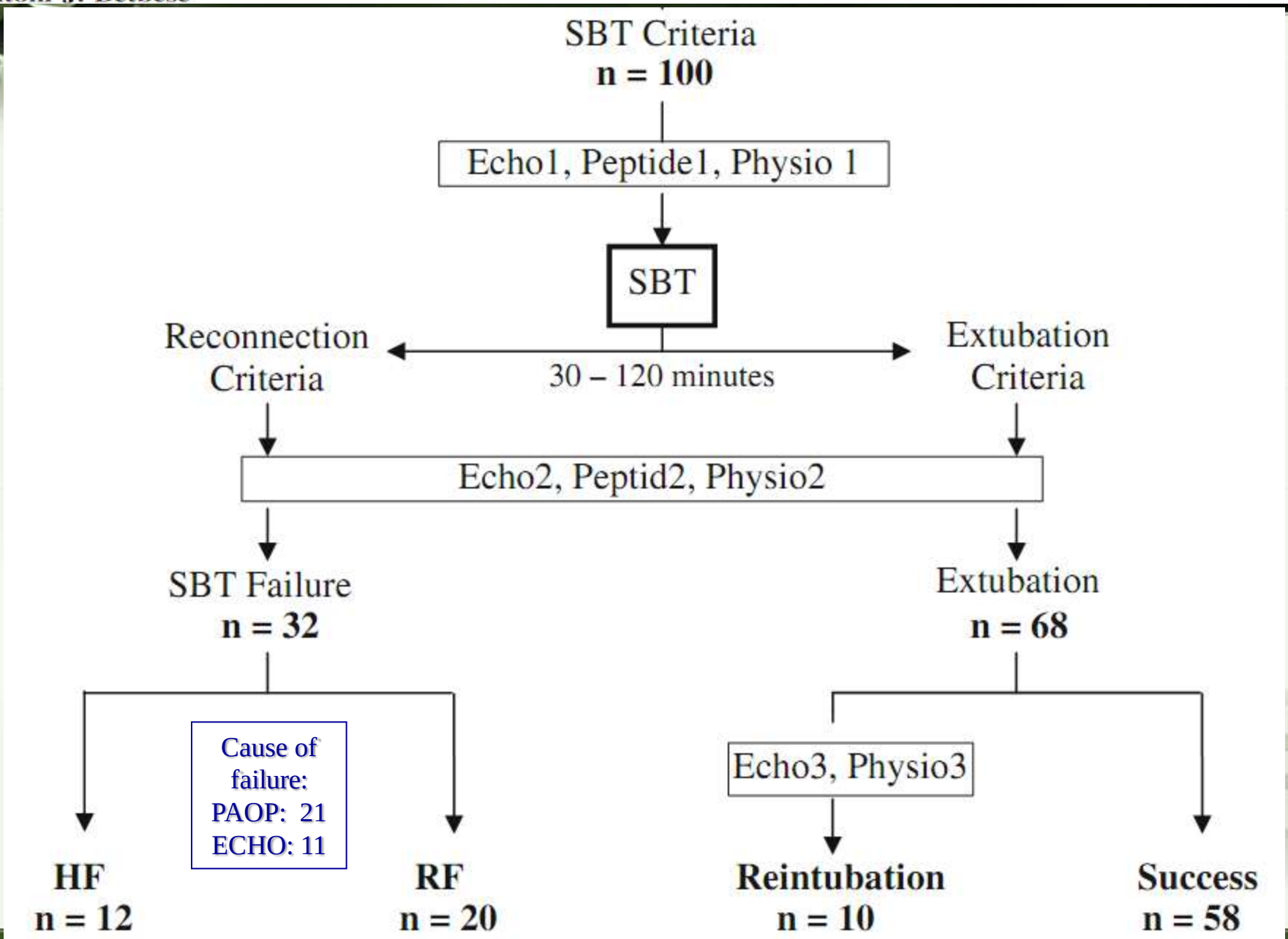


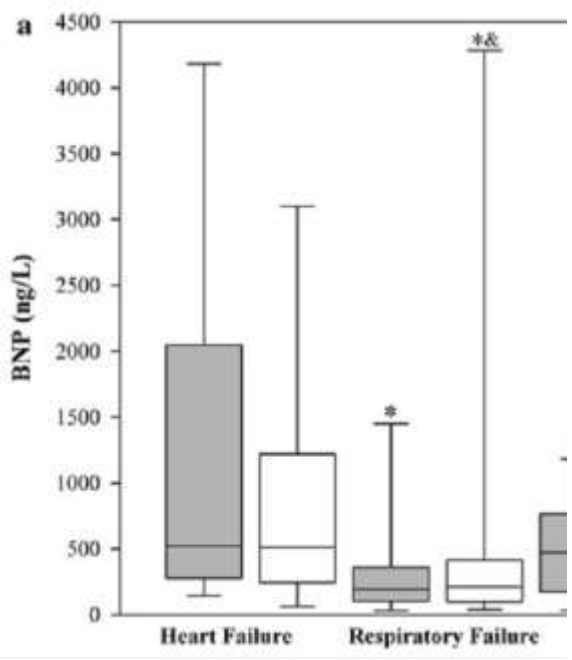
ΔNT-proBNP (pg/ml)	Sensitivity (95% CI)	Specificity (95% CI)	PPV	NPV
26,2	87,5 (47 -97)	72,7 (39 - 93)	70	88,9
53,6	87,5 (47 - 97)	81,8 (48 - 97)	77,8	90
184,7	87,5 (46 - 98)	90,9 (58 - 98)	87,5	90,9
445	75 (35 - 96)	90,9 (59 - 98)	85,7	83,3
492	62,5 (25 - 91)	90,9 (58 - 98)	83,3	76,9

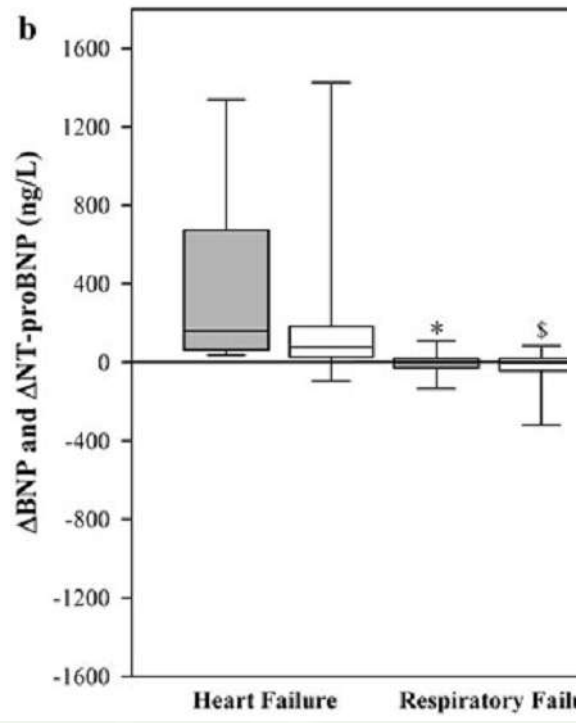
Grasso et al, CCM 2007

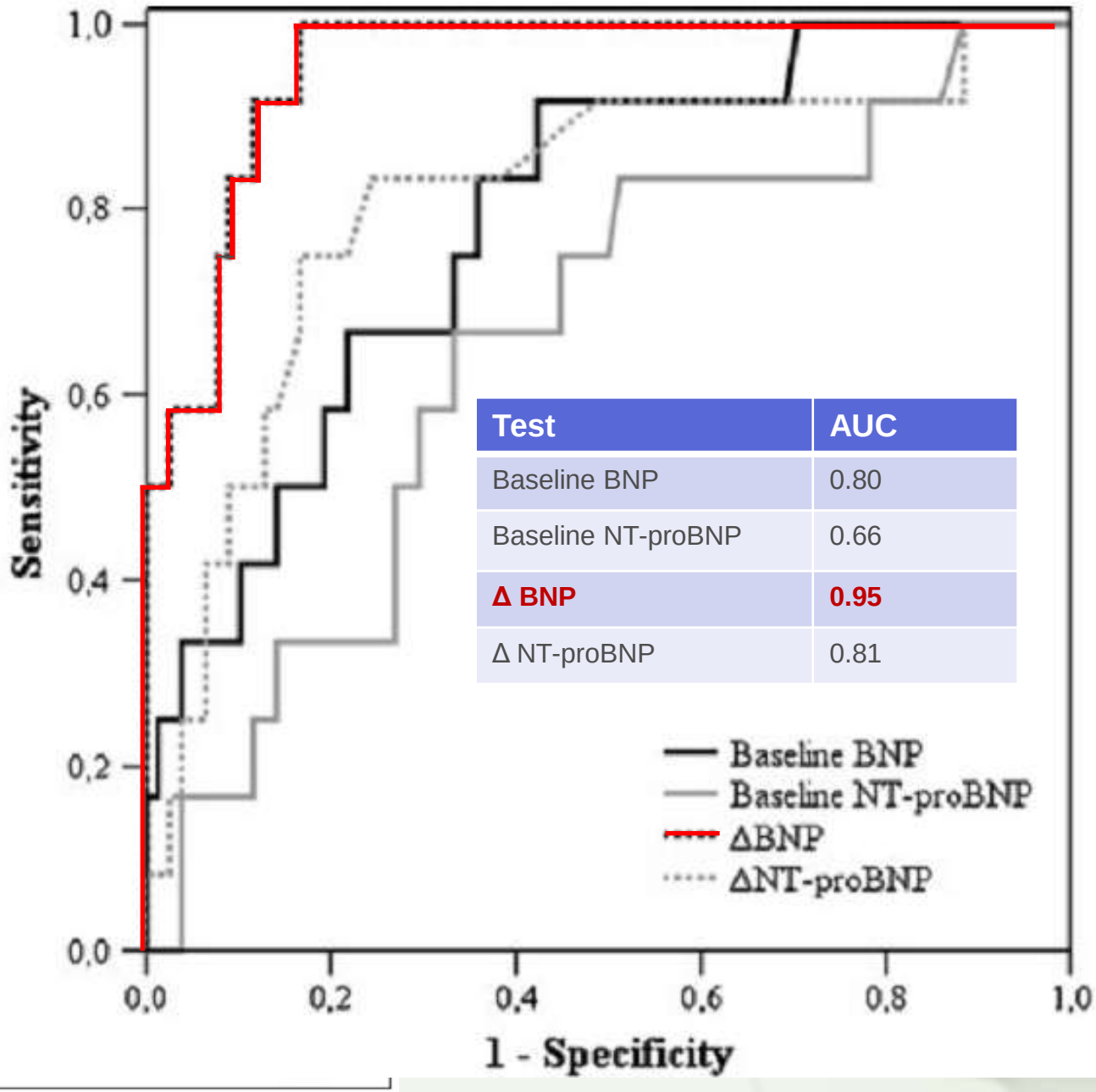
Lluís Zapata
Paula Vera
Antoni Roglan
Ignasi Gich
Jordi Ordonez-Llanos
Antoni J. Betbesé

B-type natriuretic peptides for prediction and diagnosis of weaning failure from cardiac origin









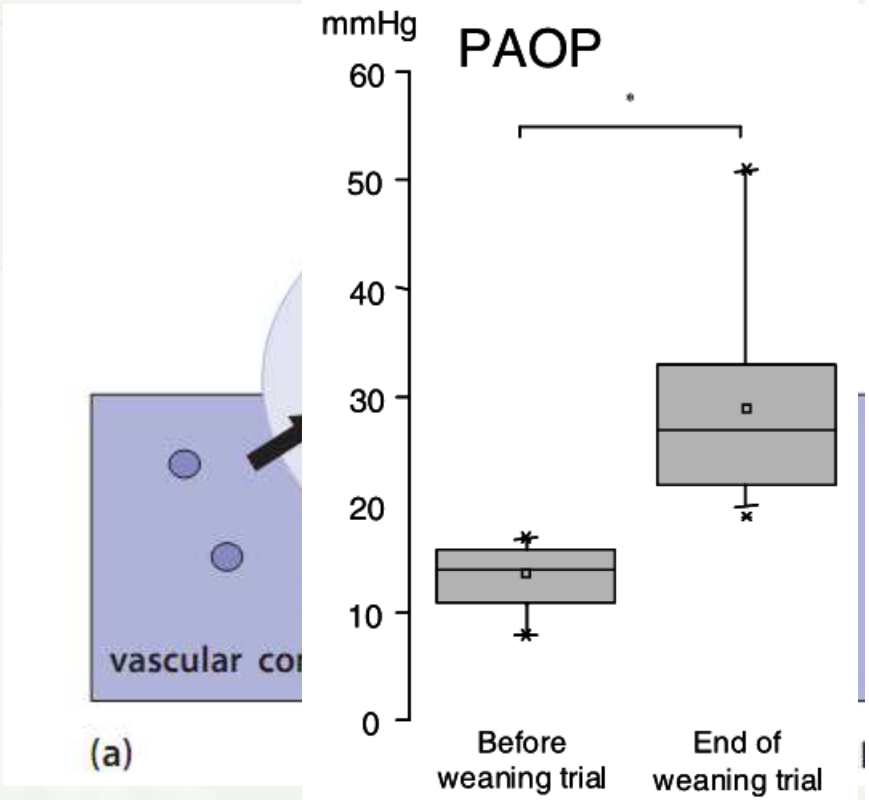
Test	AUC
Baseline BNP	0.80
Baseline NT-proBNP	0.66
Δ BNP	**0.95**
Δ NT-proBNP	0.81

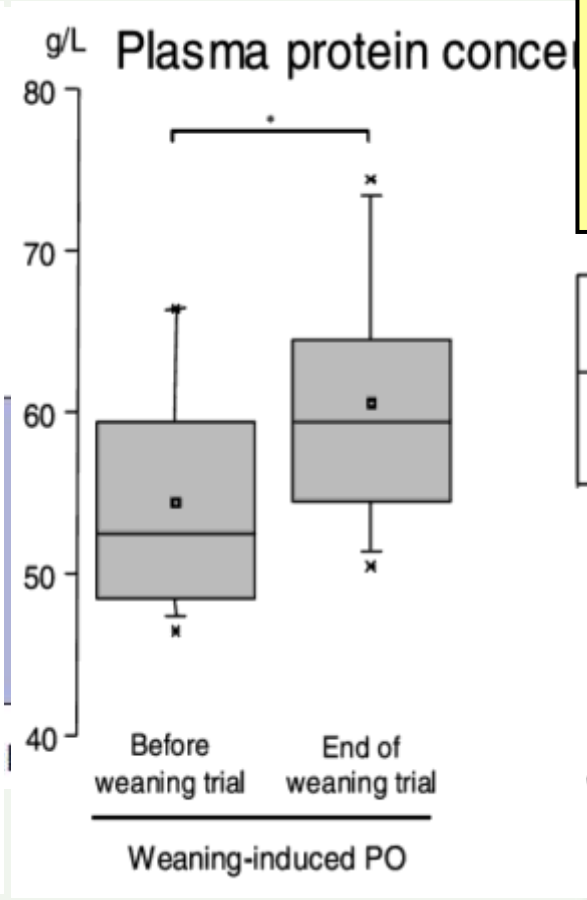
Intensive Care Med (2008) 34:1231–1238

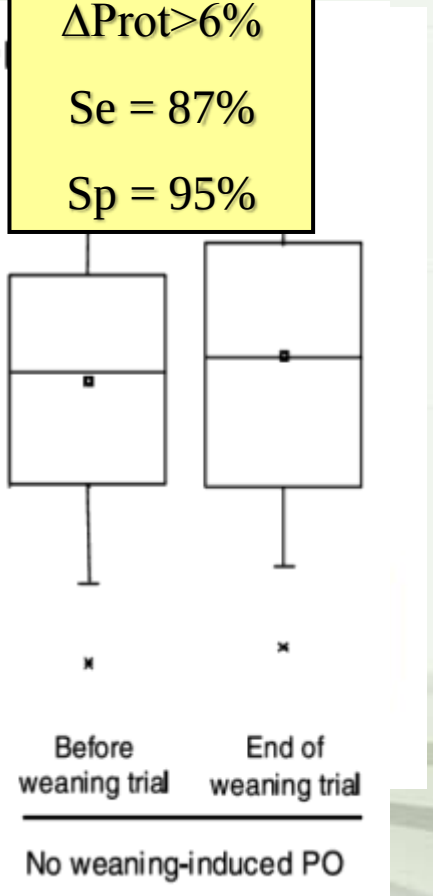
ORIGINAL

Nadia Anguel
Xavier Monnet
David Osman
Vincent Castelain
Christian Richard
Jean-Louis Teboul

Increase in plasma protein concentration for diagnosing weaning-induced pulmonary oedema







ΔProt>6%

Se = 87%

Sp = 95%

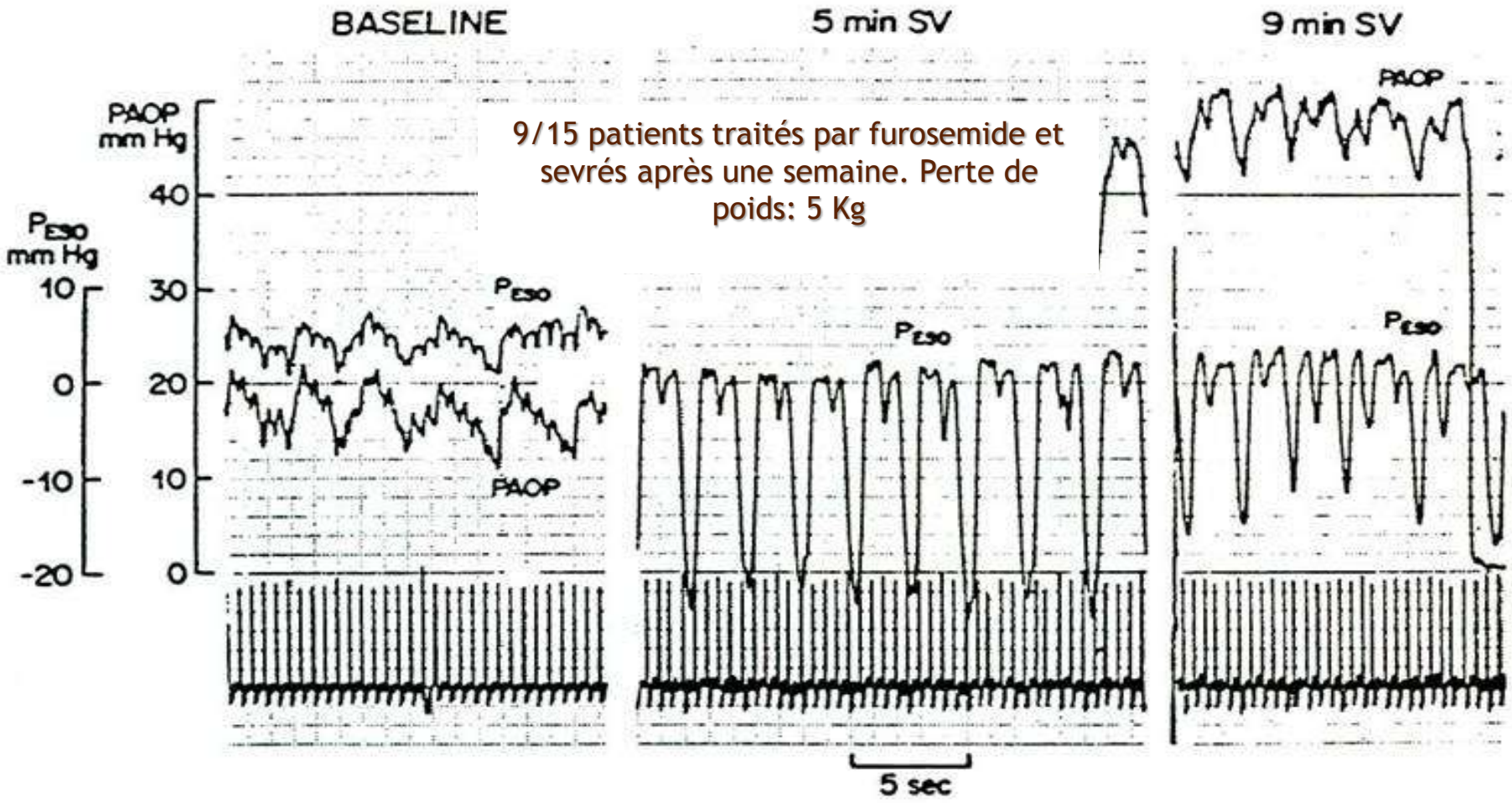
Traitement

- Diuretiques
- Nitrates
- Inodilators
- VNI

Anesthesiology
69:171–179, 1988

Acute Left Ventricular Dysfunction during Unsuccessful Weaning from Mechanical Ventilation

Francois Lemaire, M.D., Jean-Louis Teboul, M.D.,† Luc Cinotti, M.D.,‡ Guillen Giotto, M.D.,§*



9/15 patients traités par furosemide et sevrés après une semaine. Perte de poids: 5 Kg

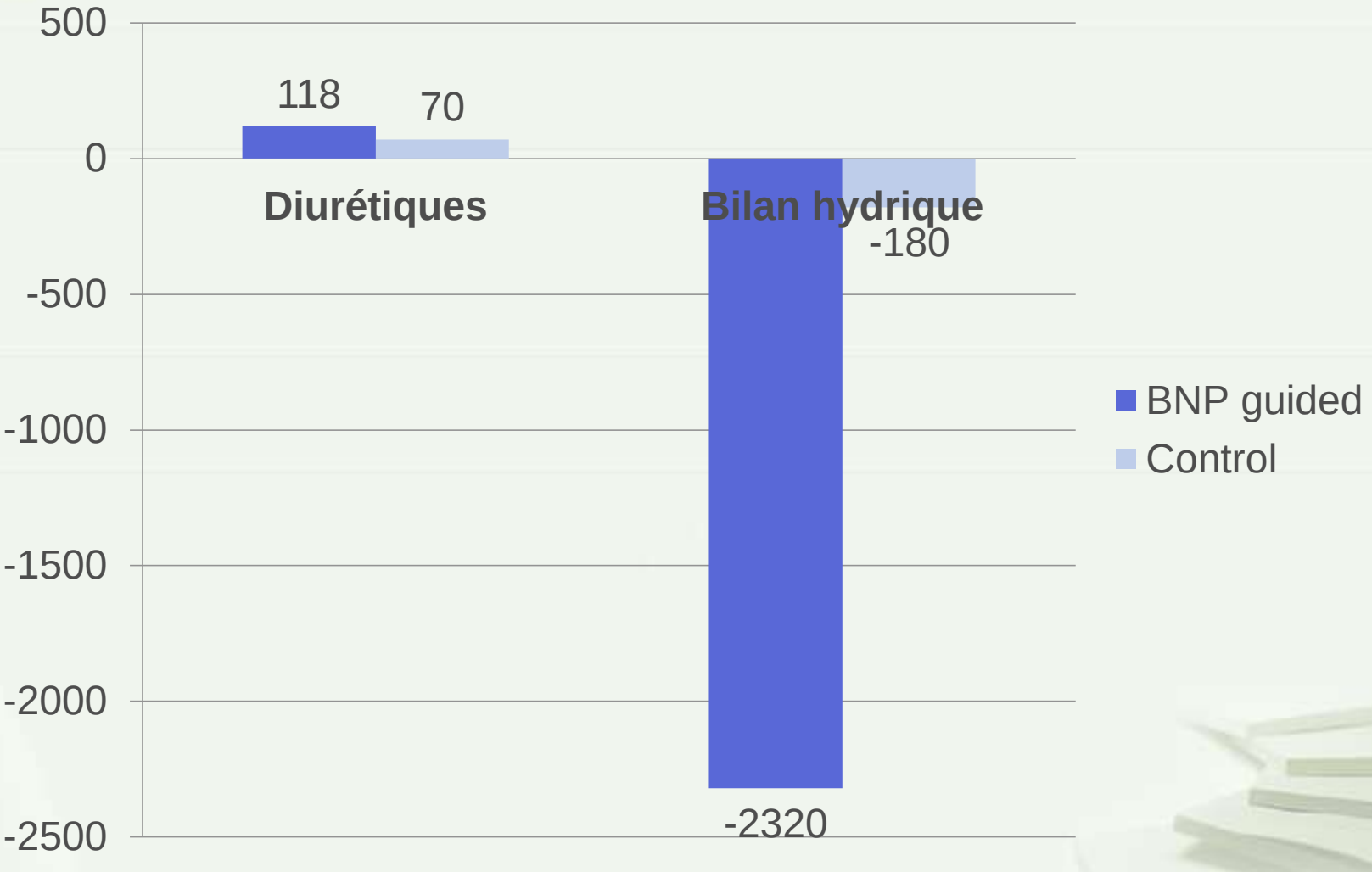
Natriuretic Peptide-Driven Fluid Management during Ventilator Weaning: A Randomized Controlled Trial

A.Mekontso Dessap et al AJRCCM 2012

- 304 patients were allocated to a BNP-driven and a physician-driven strategy of fluid management during ventilator weaning.
- On days with a BNP level ≥200 pg/mL, fluid intake was restricted and furosemide was administered (as intravenous bolus doses of 10 to 30 mg every 3 hours, to achieve a target urine output of 4.5 to 9 mL/kg/3 hours)
- The weaning process was standardised: patients in both groups were ventilated using an automatic computer driven weaning system.
- The primary end point was time to successful extubation

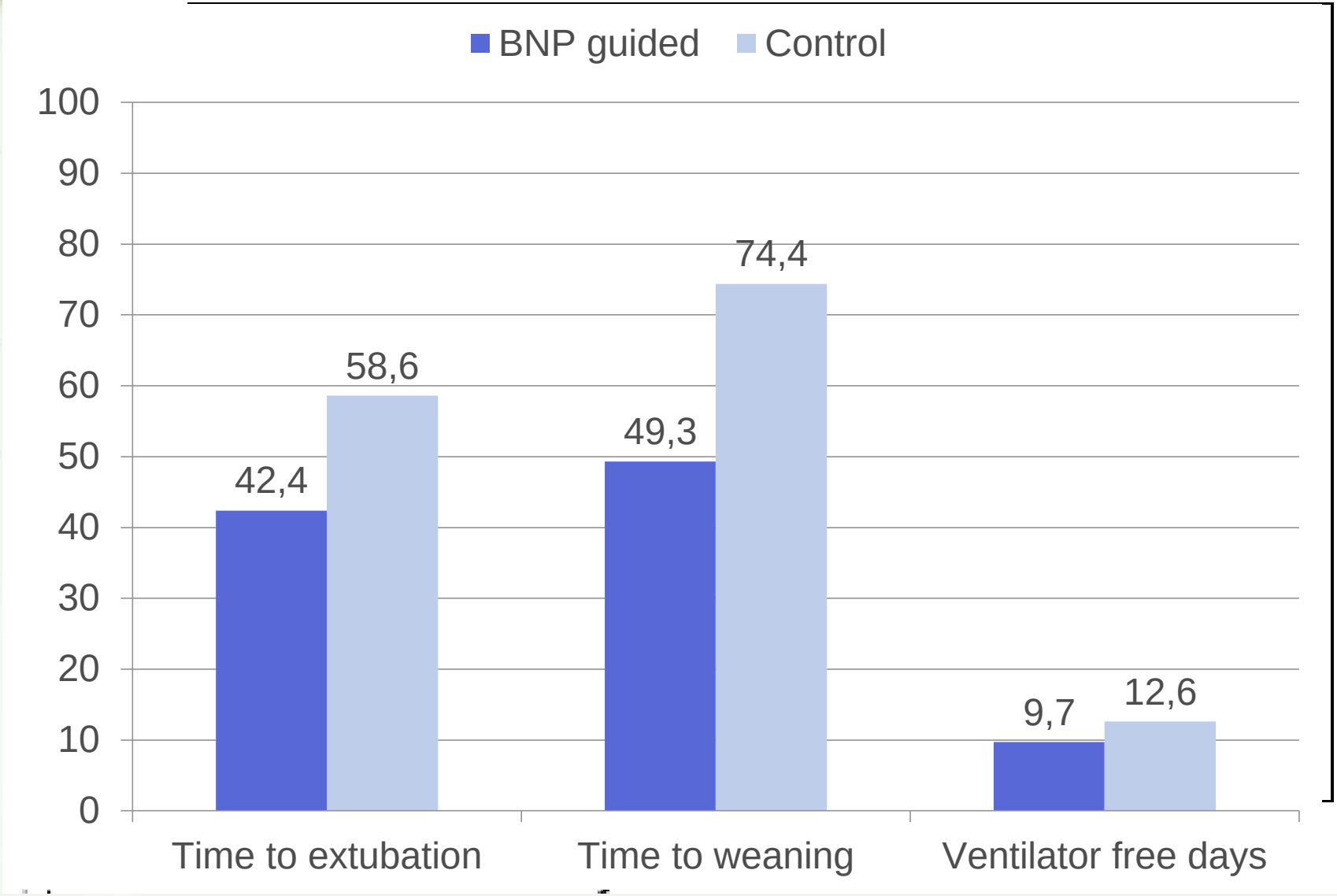
Natriuretic Peptide-Driven Fluid Management during Ventilator Weaning: A Randomized Controlled Trial

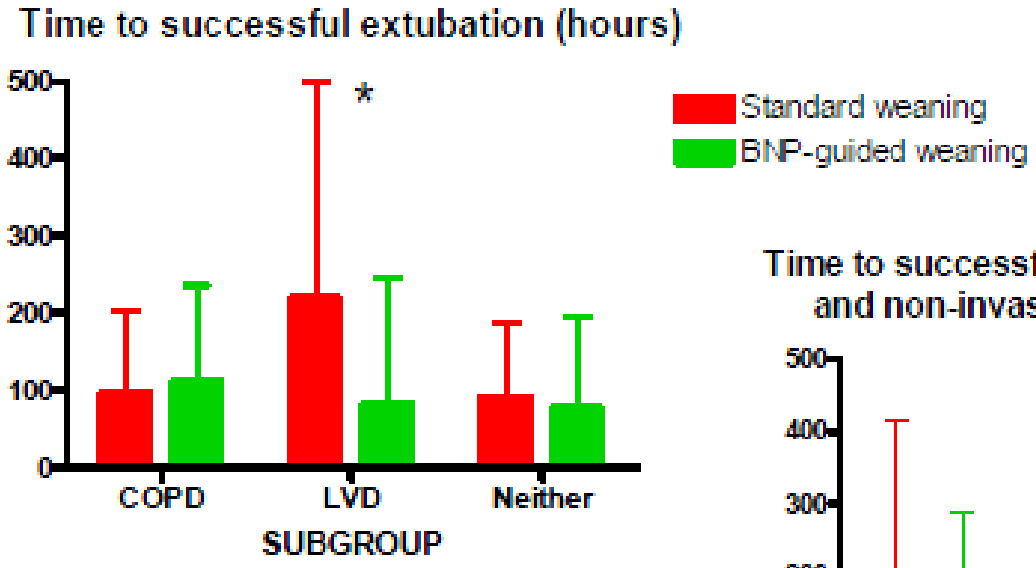
A.Mekontso Dessap et al AJRCCM 2012

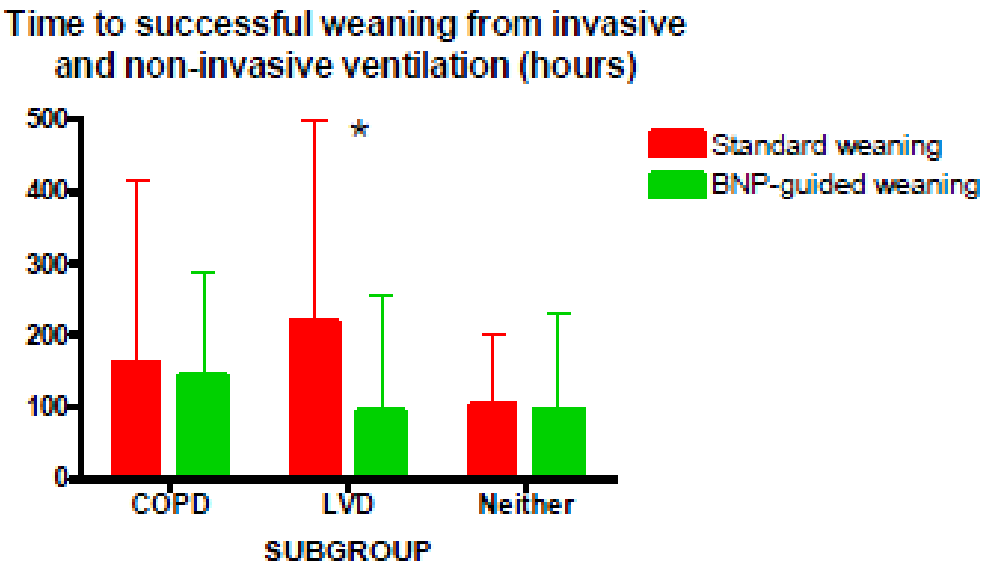


Natriuretic Peptide-Driven Fluid Management during Ventilator Weaning: A Randomized Controlled Trial

A.Mekontso Dessap et al AJRCCM 2012




Time to successful extubation (hours)
500
400
300
200
100
0
*
COPD
LVD
Neither
SUBGROUP
Standard weaning
BNP-guided weaning

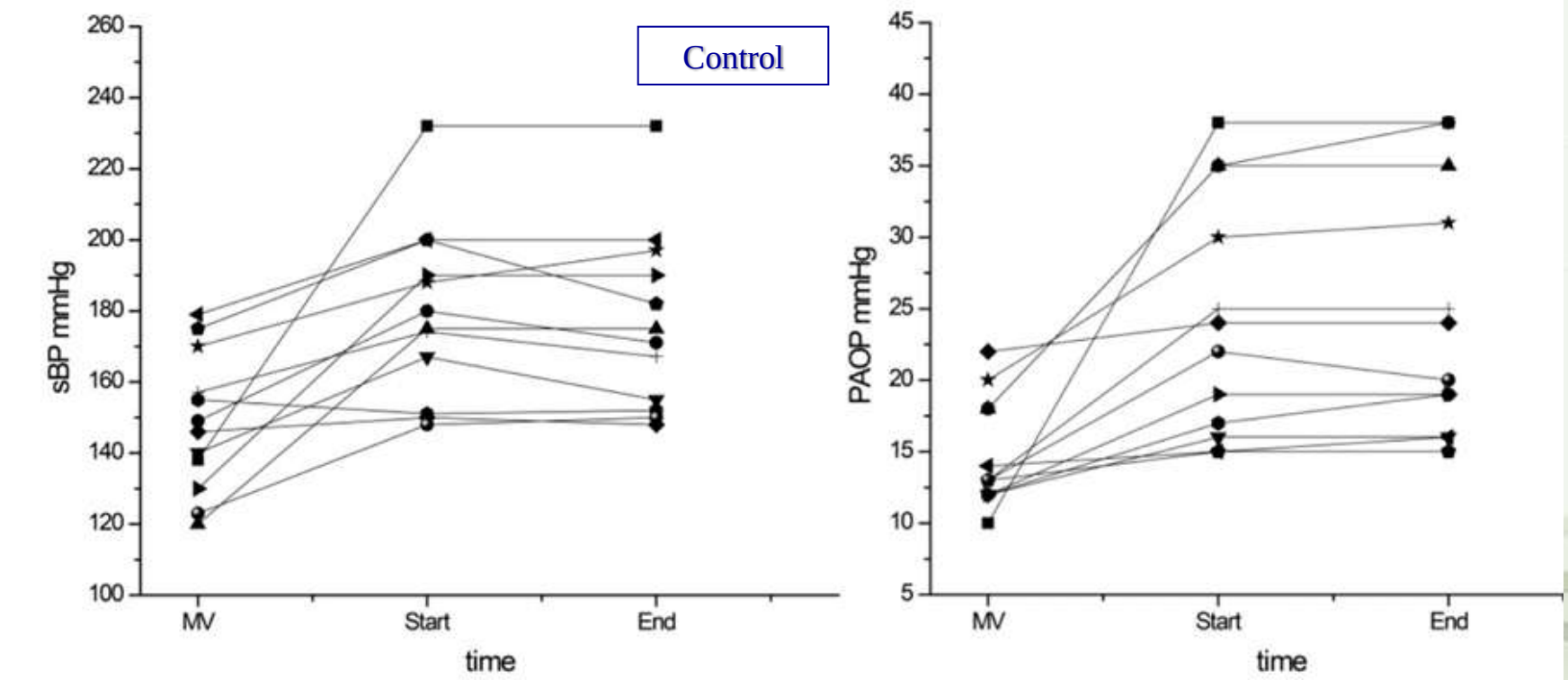

Time to successful weaning from invasive and non-invasive ventilation (hours)
500
400
300
200
100
0
*
COPD
LVD
Neither
SUBGROUP
Standard weaning
BNP-guided weaning

RESEARCH Open Access

Nitroglycerin can facilitate weaning of difficult-to-wean chronic obstructive pulmonary disease patients: a prospective interventional non-randomized study

CRITICAL CARE 2010, 14:R204

Christina Routsi[1*], Ioannis Stanopoulos[2], Epaminondas Zakynthinos[1], Panagiotis Politis[1], Vassilios Papas[1], Demetrios Zervakis[1], Spyros Zakynthinos[1]



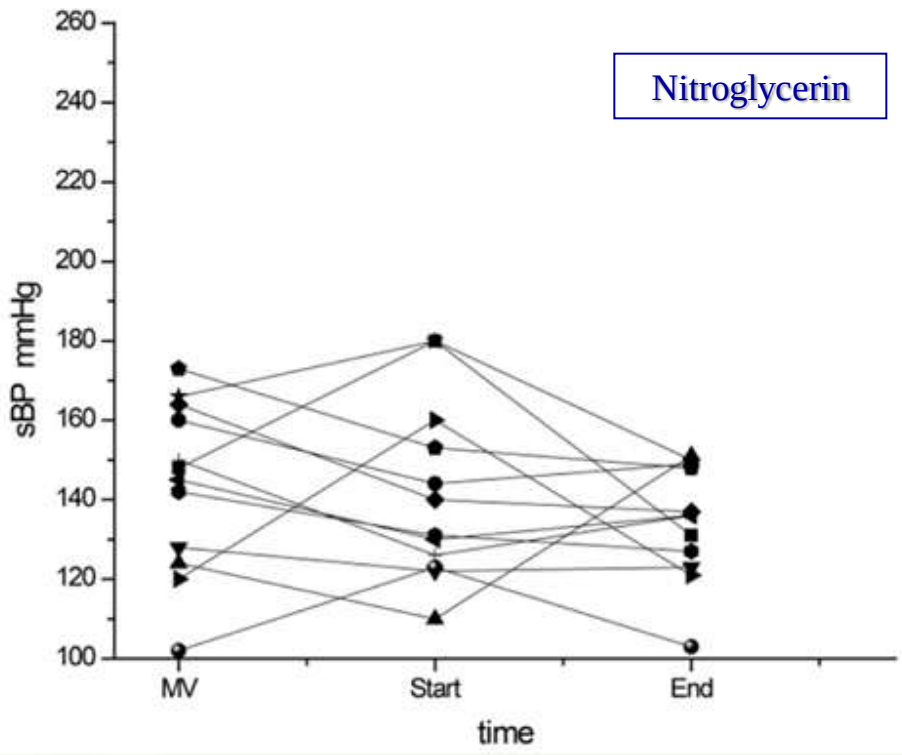
RESEARCH Open Access

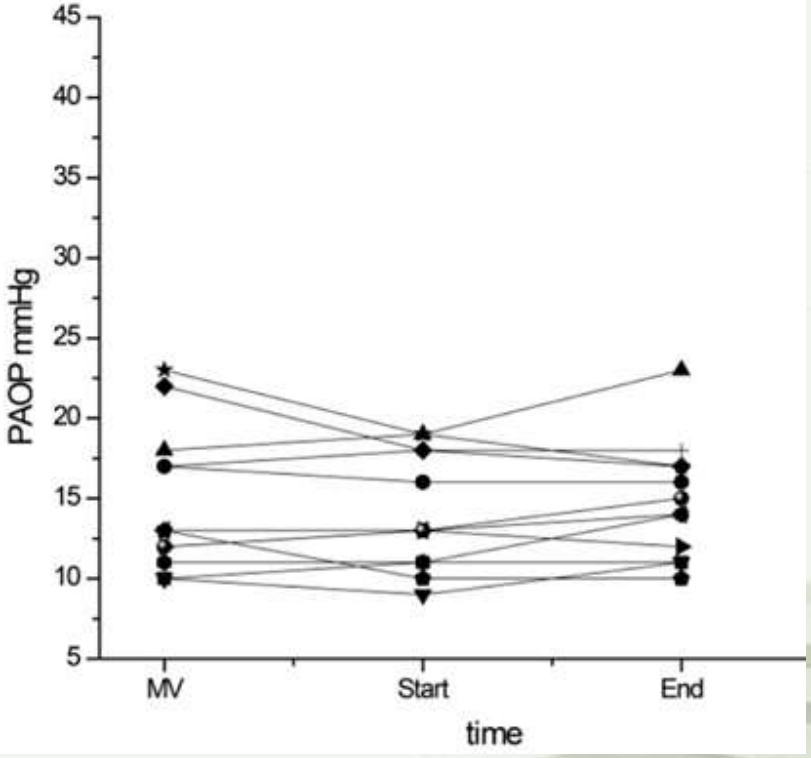
Nitroglycerin can facilitate weaning of difficult-to-wean chronic obstructive pulmonary disease patients: a prospective interventional non-randomized study

CRITICAL CARE 2010, 14:R204

Christina Routsi[1*], Ioannis Stanopoulos[2], Epaminondas Zakynthinos[1], Panagiotis Politis[1], Vassilios Papas[1], Demetrios Zervakis[1], Spyros Zakynthinos[1]

Nitroglycerin

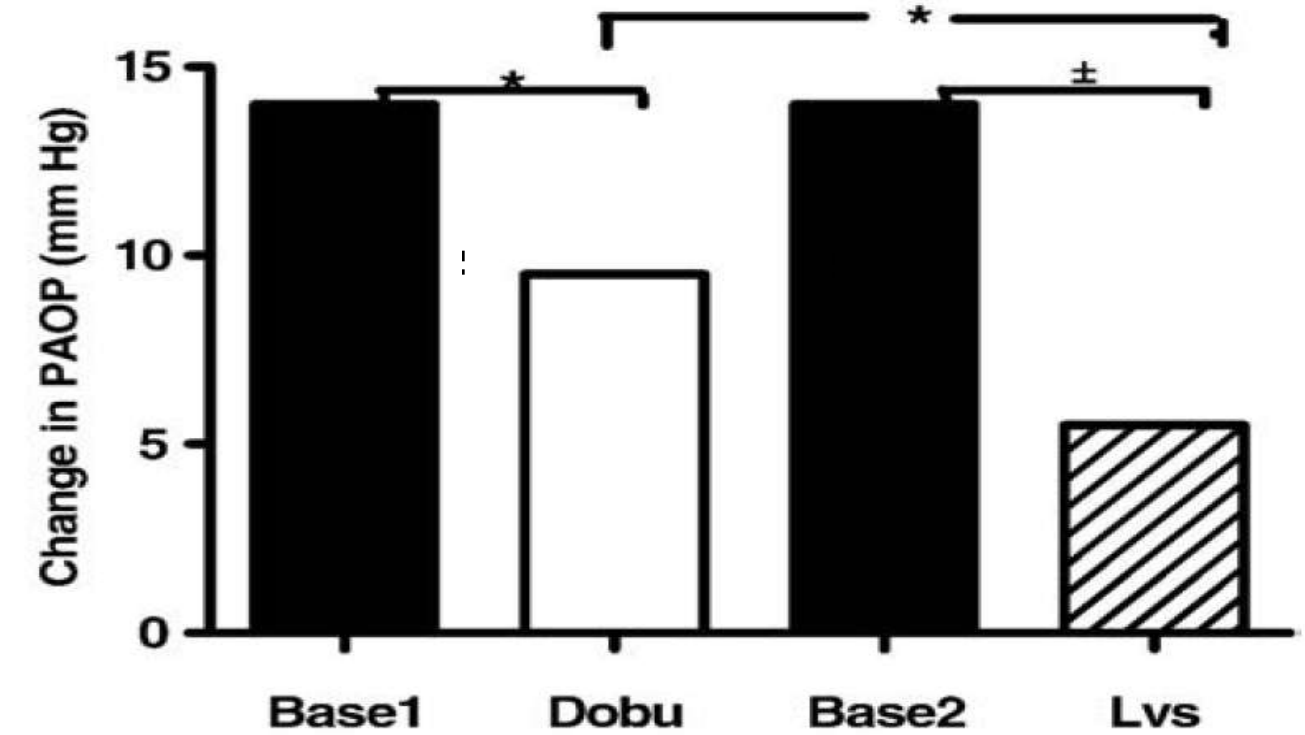




Weaning difficult-to-wean chronic obstructive pulmonary disease patients: A pilot study comparing initial hemodynamic effects of levosimendan and dobutamine

Lamia Ouanes-Besbes[a], Islem Ouanes[a], Fahmi Dachraoui[a], Saoussen Dimassi[a], Alexandre Mebazaa[b], Fekri Abroug MD[a,*]

Journal of Critical Care (2010)



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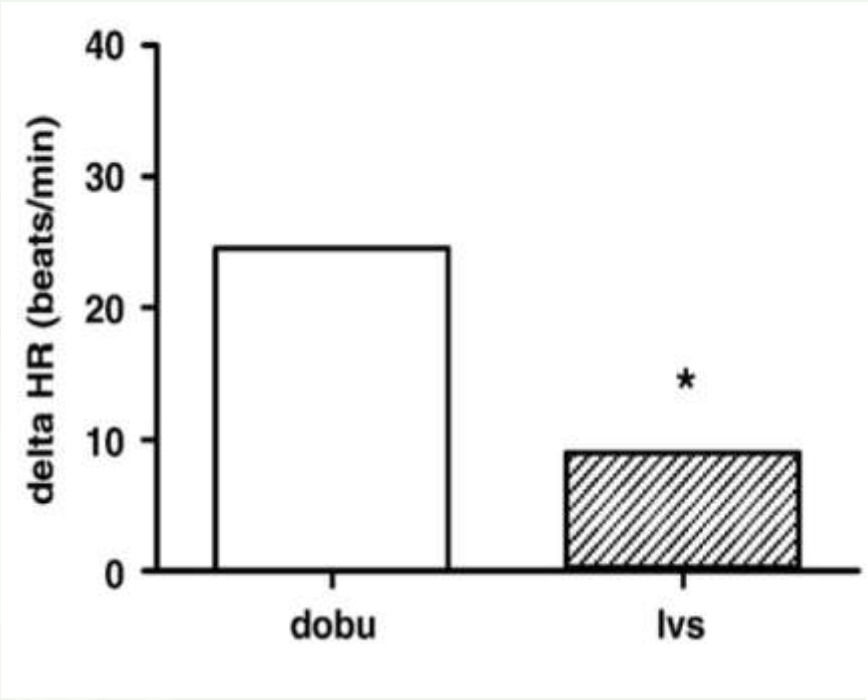
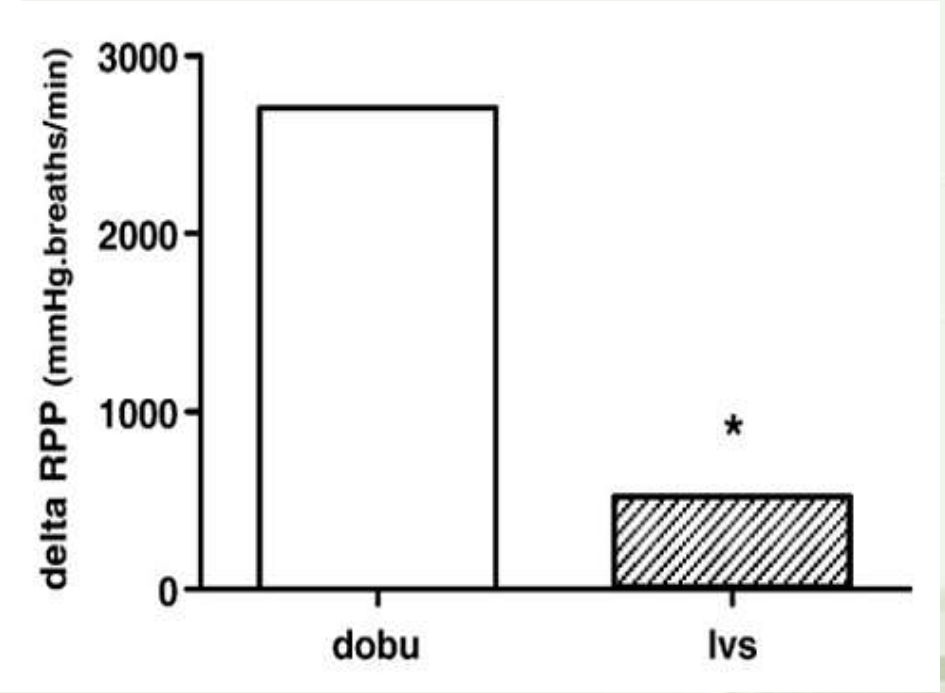




REVIEW | Annals of Internal Medicine

Meta-analysis: Noninvasive Ventilation in Acute Cardiogenic Pulmonary Edema

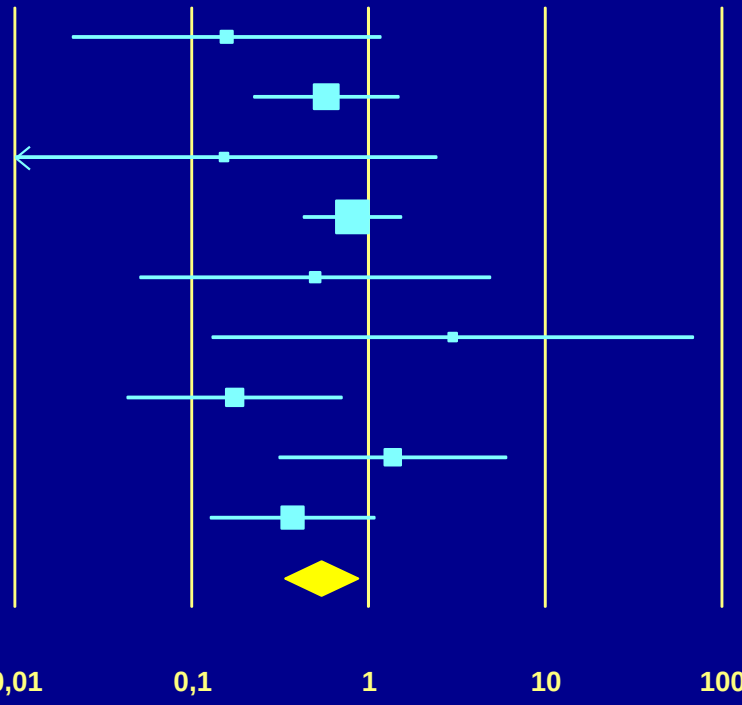
Cui-Lian Weng, MD; Yun-Tao Zhao, PhD; Qing-Hua Liu, MM; Chang-Jun Fu, PhD; Feng Sun, PhD; Yan-Liang Ma, MD; Yan-Wen Chen, MD; and Quan-Ying He, MD

Ann Intern Med. 2010;152:590-6

Study name	Risk ratio	Lower limit	Upper limit	p-Value
Masip_2000	0,158	0,021	1,186	0,073
Levitt_2001	0,578	0,223	1,500	0,260
Park_2001	0,153	0,010	2,453	0,185
Nava_2003	0,813	0,426	1,550	0,529
Ferrer_2003	0,500	0,051	4,944	0,553
Crane_2004	3,000	0,129	69,515	0,493
Park_2004	0,175	0,043	0,715	0,015
Gray_2009	1,375	0,310	6,098	0,676
Ghannem_2009	0,373	0,127	1,096	0,073
	0,537	0,334	0,863	0,010

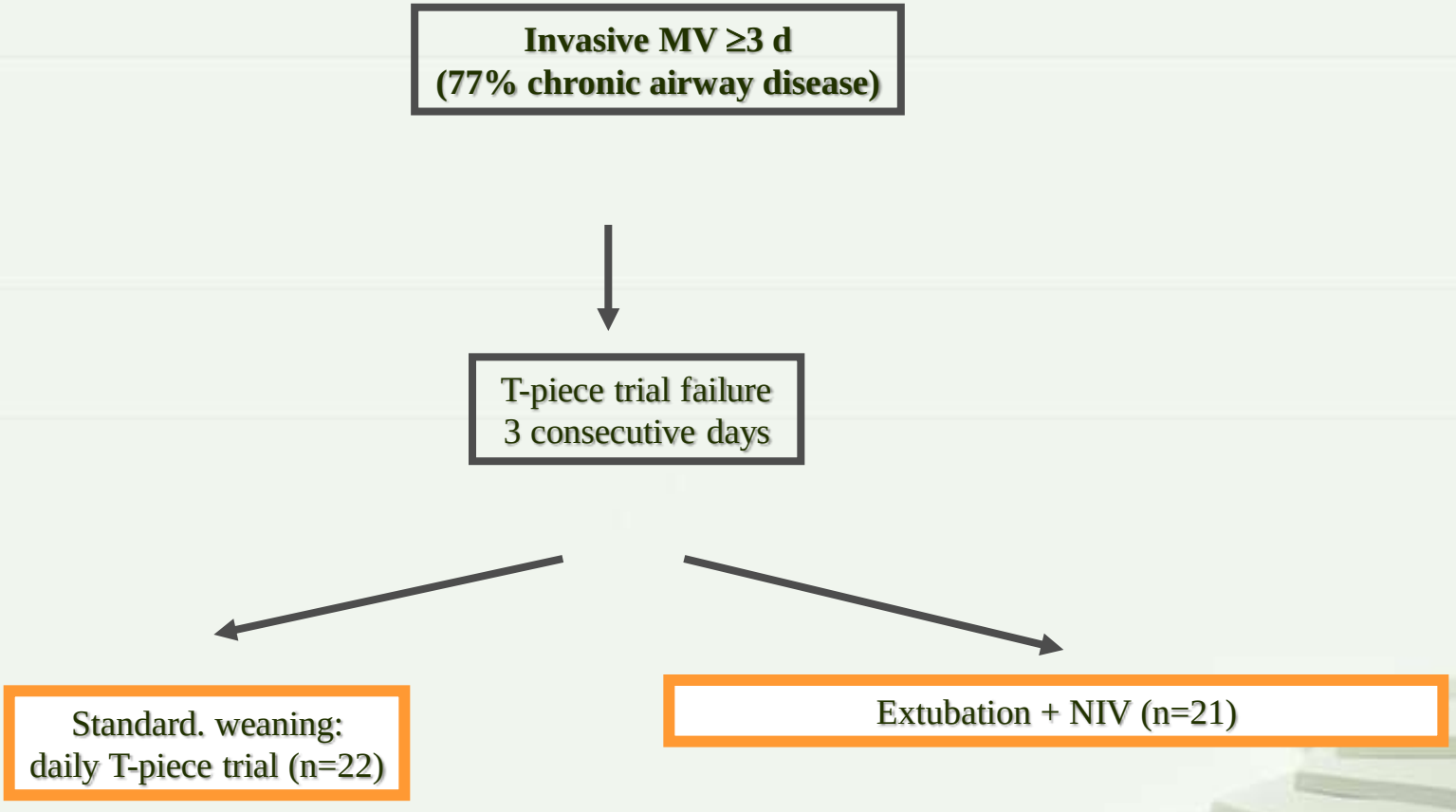
Statistics for each study

Risk ratio and 95%CI



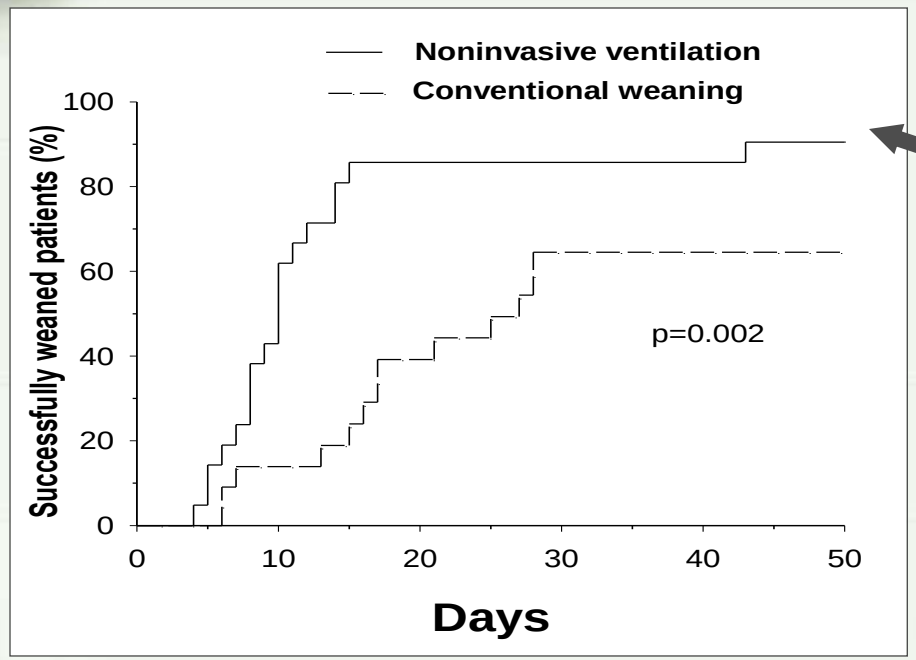
Favours BIPAP Favours ST

VNI dans le sevrage difficile



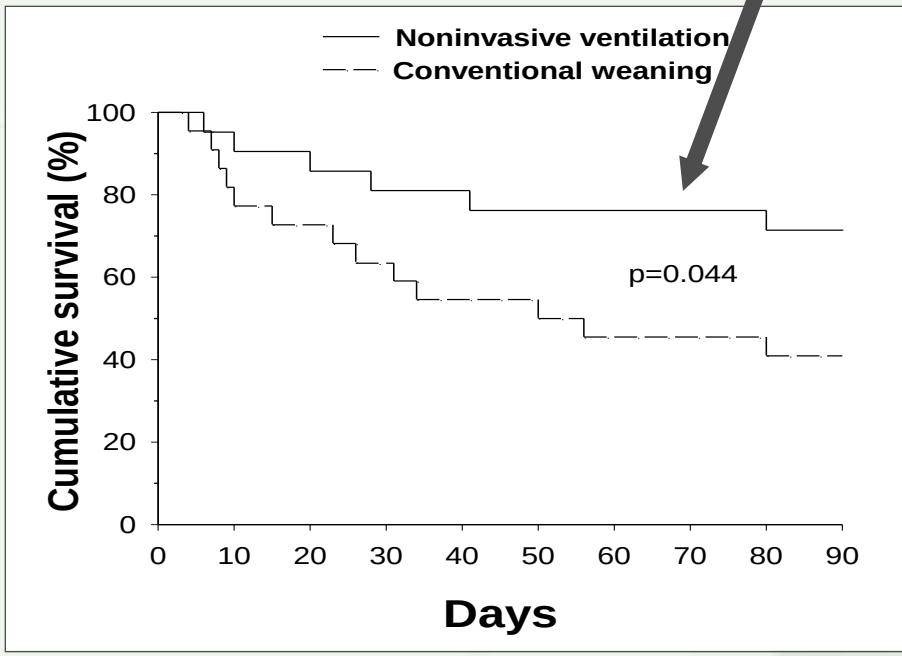
Ferrer M. AJRCCM 2003

La VNI améliore le taux de succès du sevrage



Improved weaning success

Improved Survival



Ferrer M. AJRCCM 2003