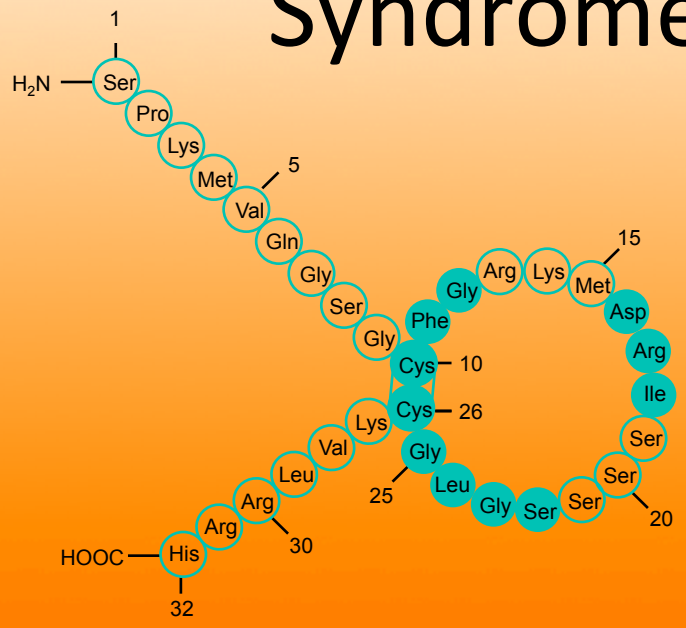
Peptides natriurétiques
et
Syndrome coronarien aigu



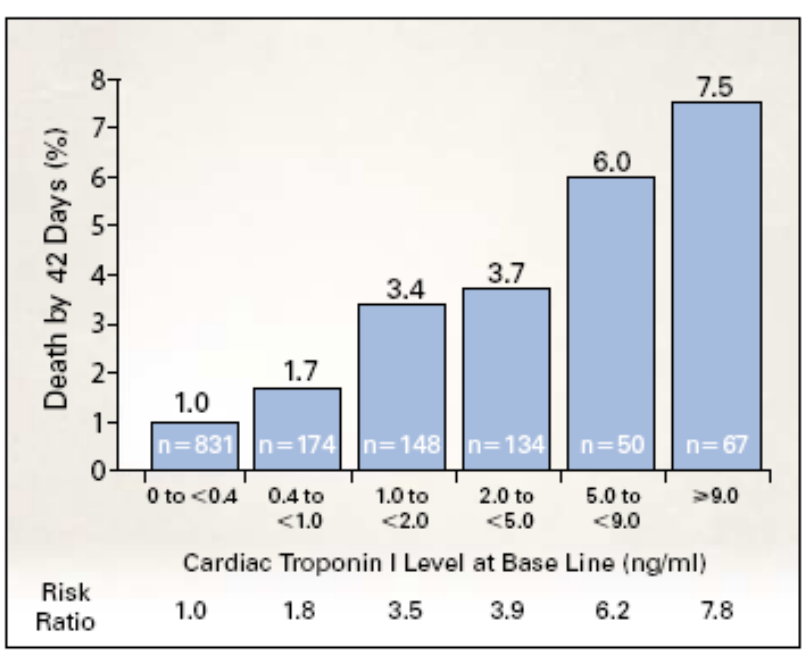
Dr N.LEJEUNE
CH.SAINTONGE

Syndrome coronarien

- Problème quotidien pour le cardiologue
- Parfois assez simple…mais souvent compliqué
  - Signes cliniques : douleur souvent atypique
  - Signes ECG : BBG, ECG anormaux chez le coronarien connu
- Traitement et pronostic éminemment variable selon les signes cliniques, biologiques et électro cardiographiques….

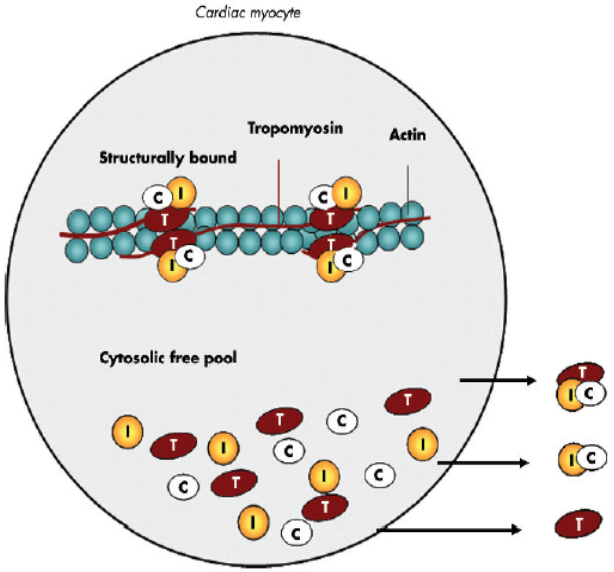
Troponines

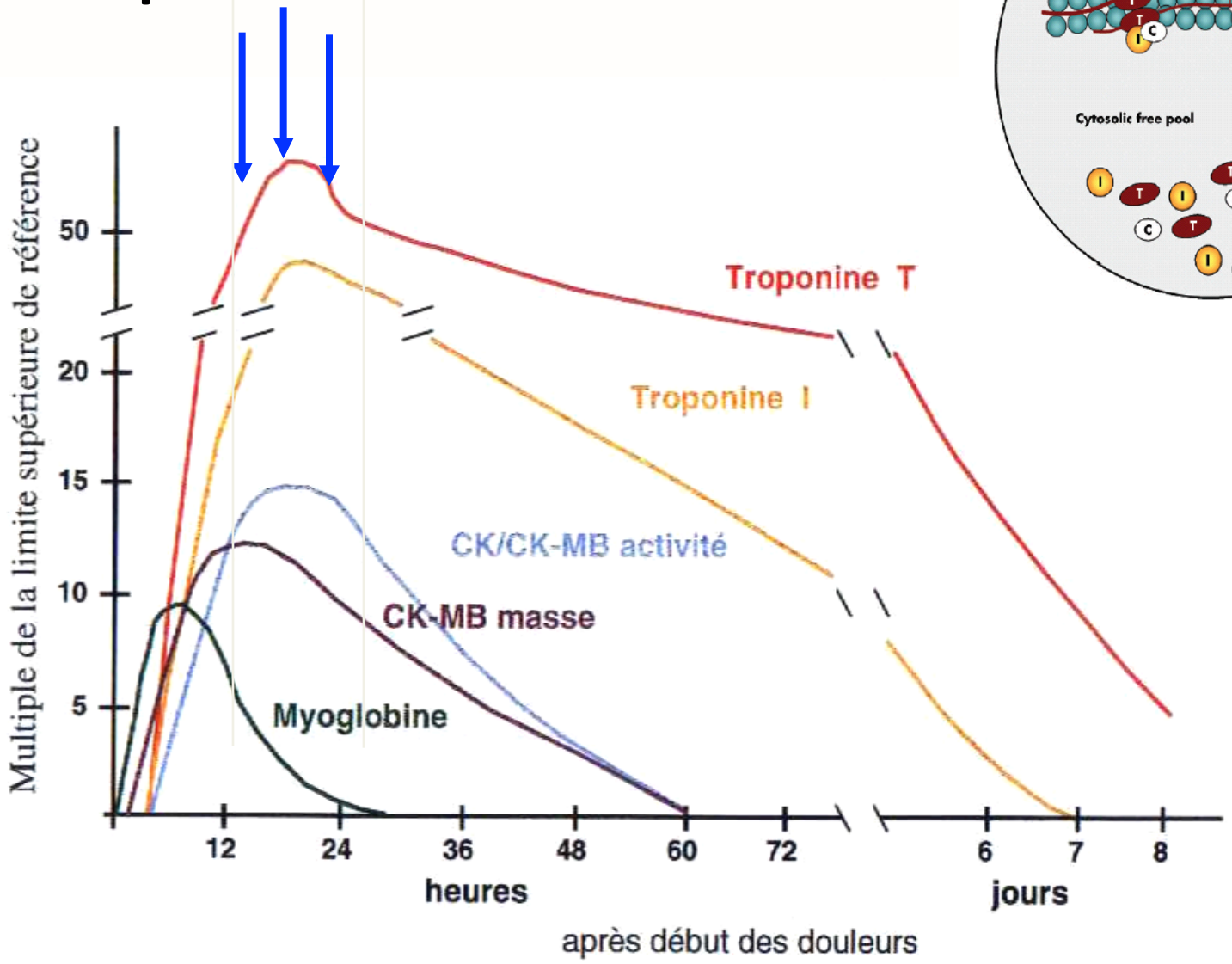
- Intérêt bien démontré dans les SCA
  - Permet d'apprécier le risque évolutif
  - Permet de guider le traitement
- Problème de la spécificité (Myocardite, EP, IC…)
- Parfois optimistes



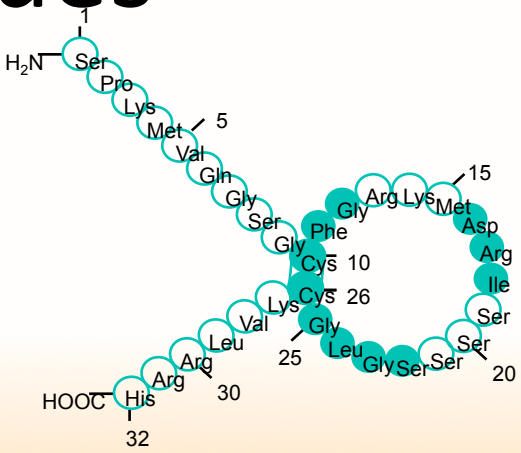
N Engl J Med, Vol. 346, No. 26 · June 27, 2002

Troponine et SCA





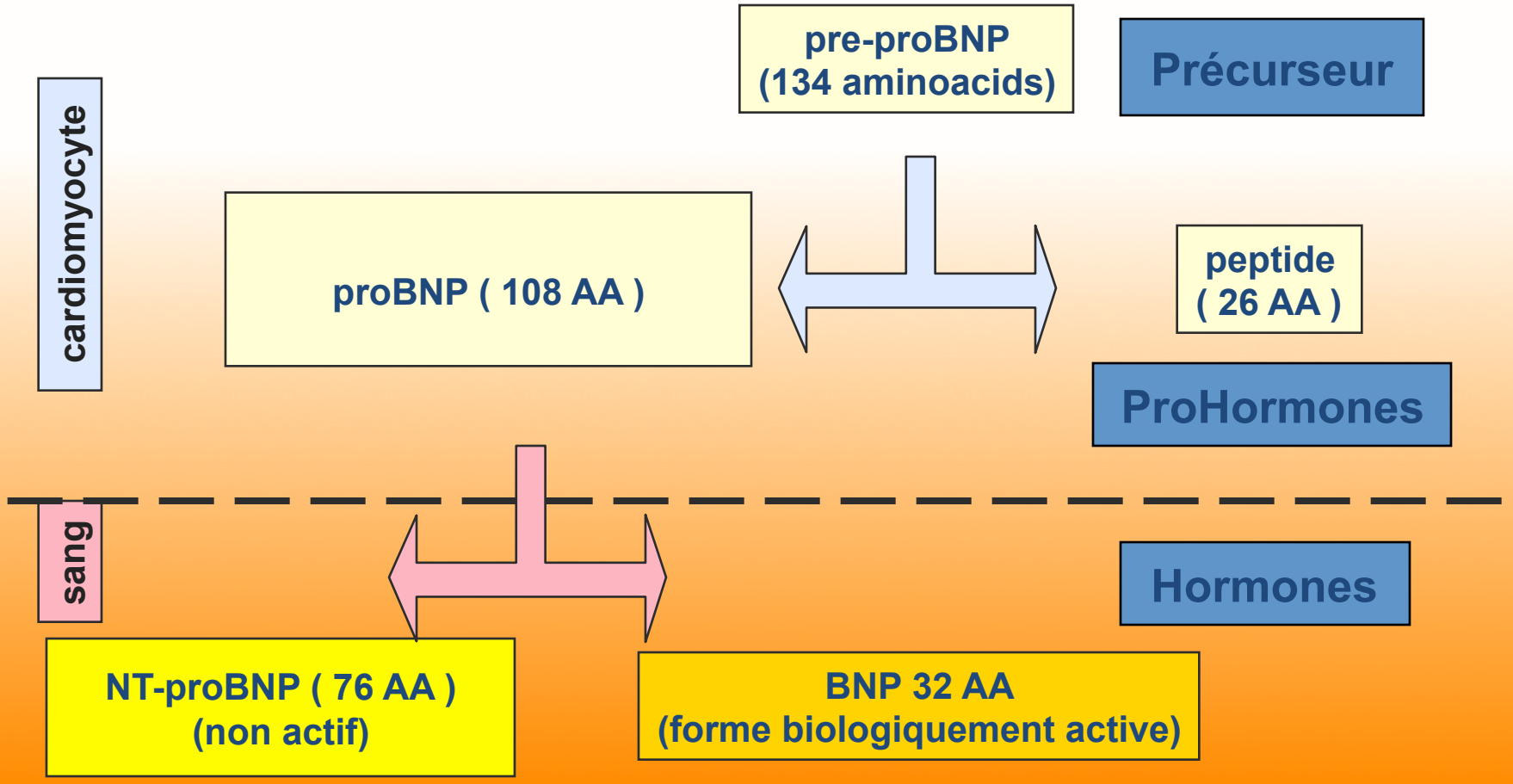
Peptides natriurétiques



- Structure biochimique commune
- Dosage facile et devenu routinier
- Résultat rapide
- Demi-vie courte (22 min pour BNP et 120 min pour NT-proBNP)
- Secrétés en réponse au stretch pariétal

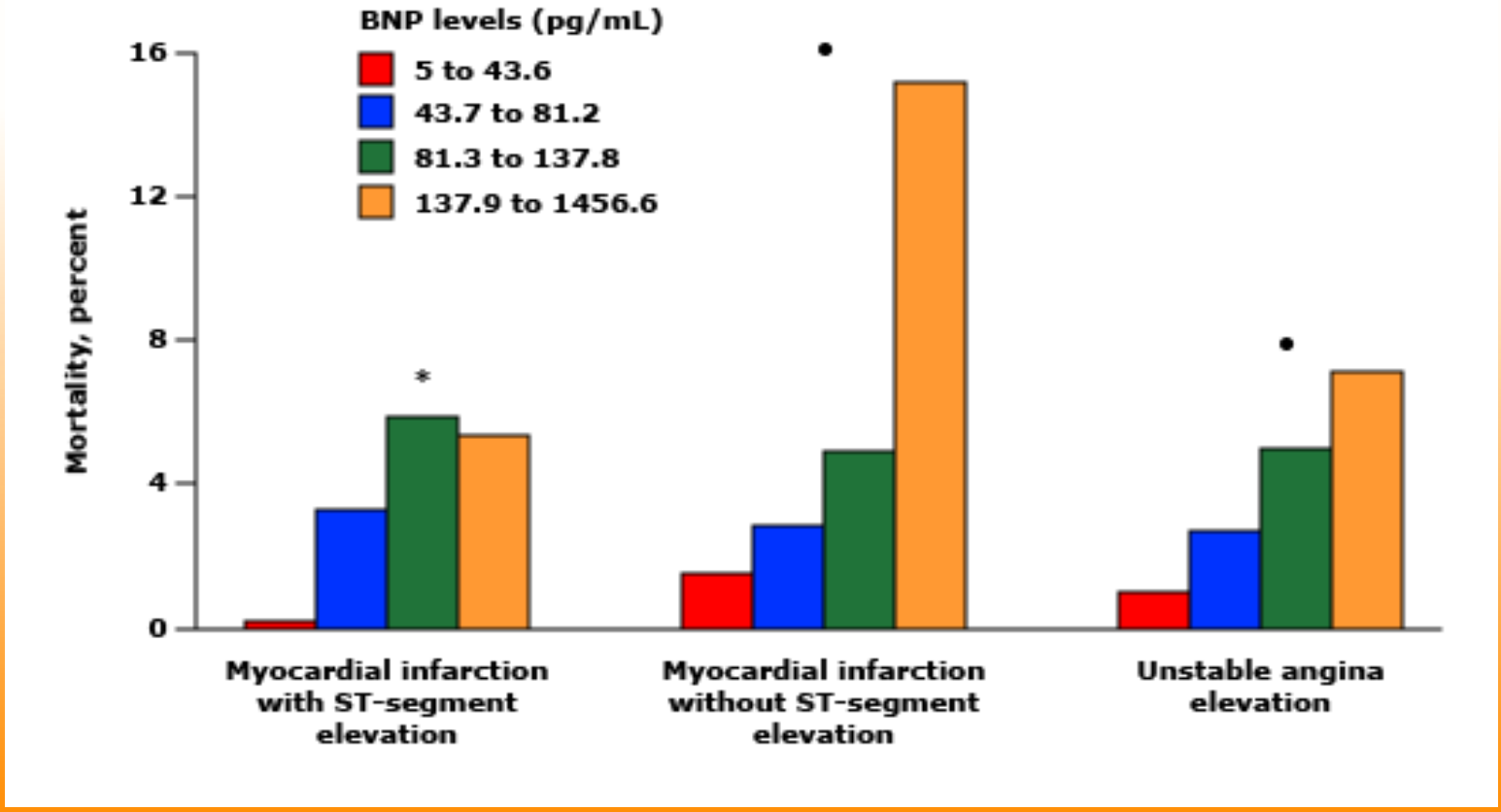
- Intérêt majeur dans la gestion de l'insuffisance cardiaque aiguë ou chronique

Synthèse des peptides de type B



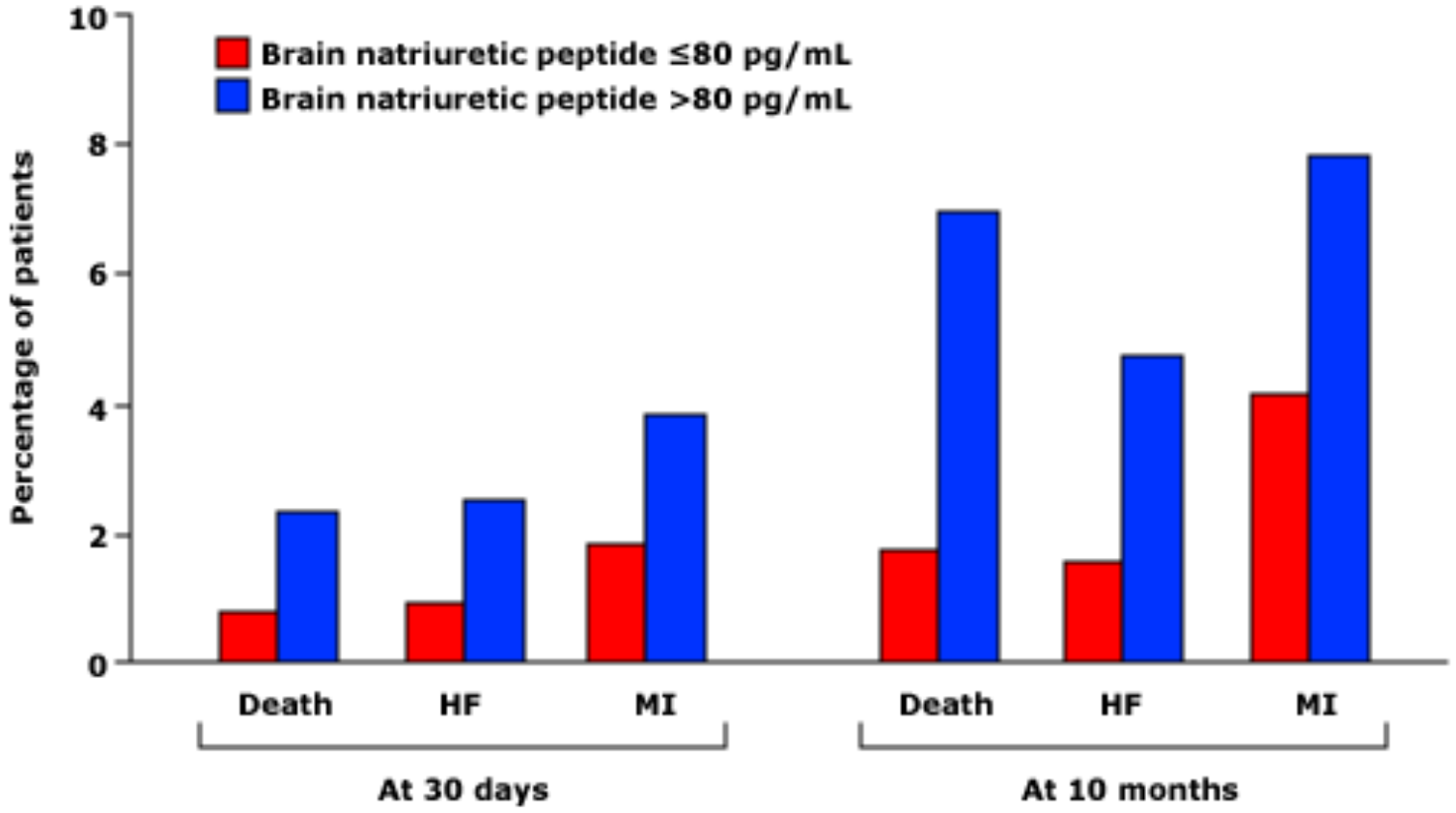
PEPTIDES NATRIURETIQUE/SCA

BNP et mortalité dans le SCA



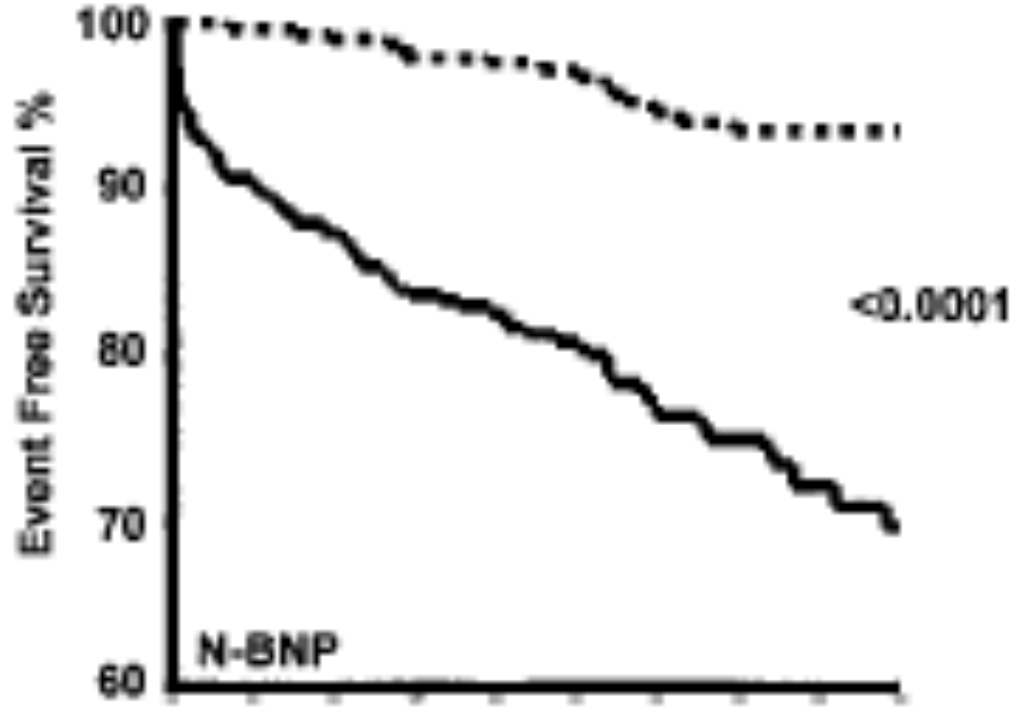
Lemos, JA, Morrow, DA, Bentley, JH, et al, N Engl J Med 2001; 345:1014

Evolution post SCA



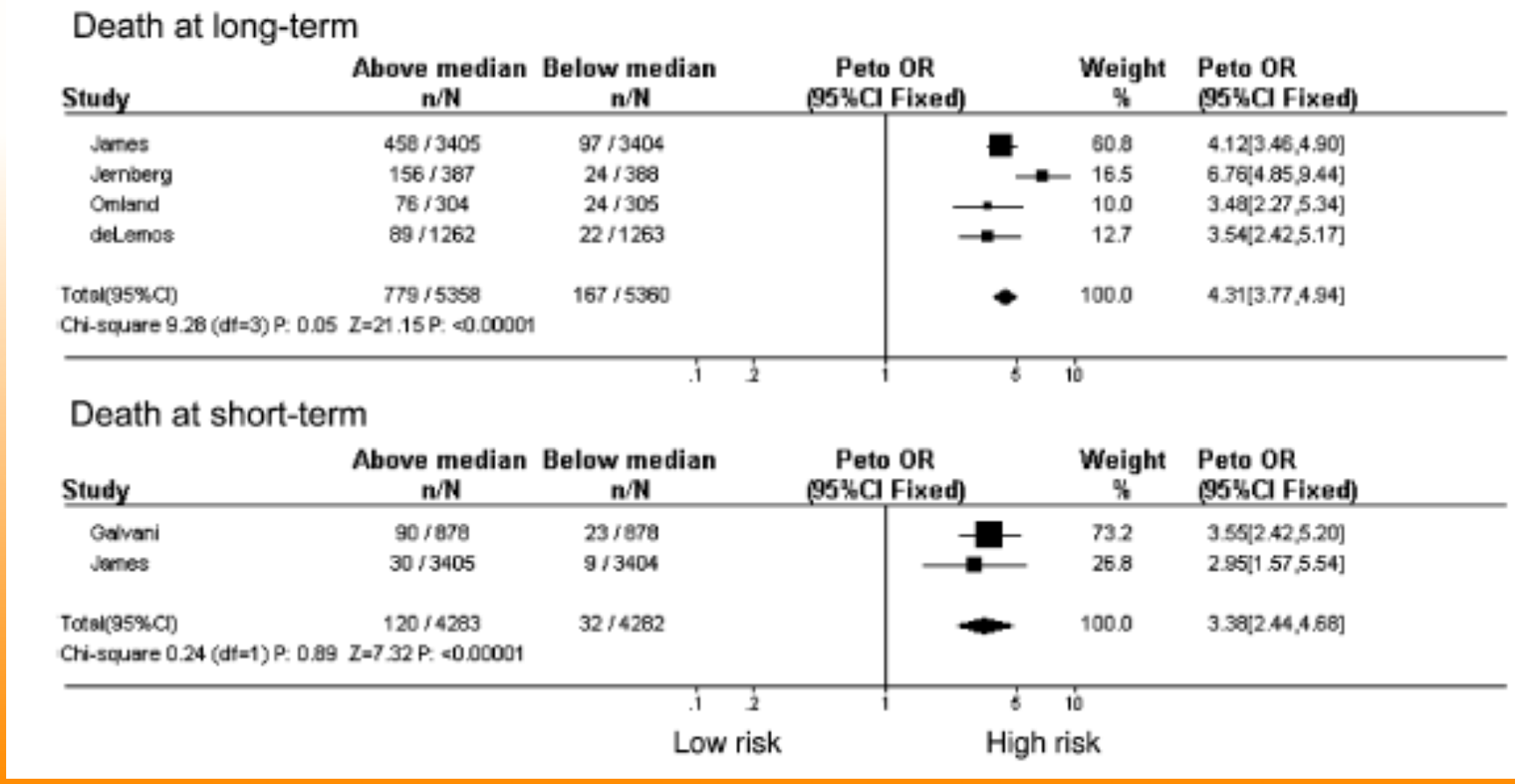
Lemos, JA, Morrow, DA, Bentley, JH, et al, N Engl J Med 2001; 345:1014

Le NT Pro BNP est un marqueur indépendant de risque d'évenement post IDM.



						Events	%
Above	334	257	198	116	56	(79)	24
Below	332	279	224	166	59	(16)	5

Le NT-proBNP est un marqueur indépendant de risque de décès a court et long terme après un evenement coronarien



M. Galvani et al. / The European Journal of Heart Failure 6 (2004) 327–333

JACC Vol. 42, No. 11, 2003
December 3, 2003:1909–16

Le NT-proBNP est un marqueur de sévérité de la coronaropathie

Table 1. Baseline Characteristics in Relation to NT-proBNP Level (n = 2,019)

	First Tertile of NT-proBNP <294 ng/l (Men)	Second Tertile of NT-proBNP 294–905 ng/l (Men)	Third Tertile of NT-proBNP ≥906 ng/l (Men)	p Value
Median ag				< 0.001
Hypertensi				NS
Hyperlipid				0.02
Current sm				NS
Diabetes m				NS
Previous M				< 0.001
Congestive				< 0.001
Angina >4				NS
Chest pain				NS
ST-segment depression at entry*	231 (35%)	302 (45%)	364 (54%)	< 0.001
Troponin T ≥0.03 μg/l†	262 (39%)	493 (75%)	603 (91%)	< 0.001
Interleukin-6 ≥5 ng/l‡	97 (15%)	165 (25%)	285 (43%)	< 0.001
Medication on admission				
Aspirin	230 (34%)	231 (34%)	277 (41%)	0.01
≥1 anti-anginal drug	293 (44%)	310 (46%)	348 (52%)	0.009
ACE inhibitor	79 (12%)	75 (11%)	95 (14%)	NS
LVEF§				
>0.55	418 (75%)	336 (62%)	234 (43%)	< 0.001
0.45–0.55	105 (19%)	149 (28%)	177 (33%)	< 0.001
<0.45	31 (6%)	56 (10%)	127 (24%)	< 0.001
Coronary angiography¶				
0-vessel disease	91 (26%)	31 (9%)	16 (5%)	< 0.001
1-vessel disease	99 (28%)	115 (34%)	75 (24%)	0.02
2-vessel disease	79 (23%)	88 (26%)	72 (23%)	0.54
3-vessel or LMCA disease	80 (23%)	103 (31%)	145 (47%)	< 0.001

Tritronculaires:	23%	31%	47%
Troponine positive	39%	75%	91%
FEVG < 45%	6%	10%	24%

JACC Vol. 42, No. 11, 2003
December 3, 2003:1909–16

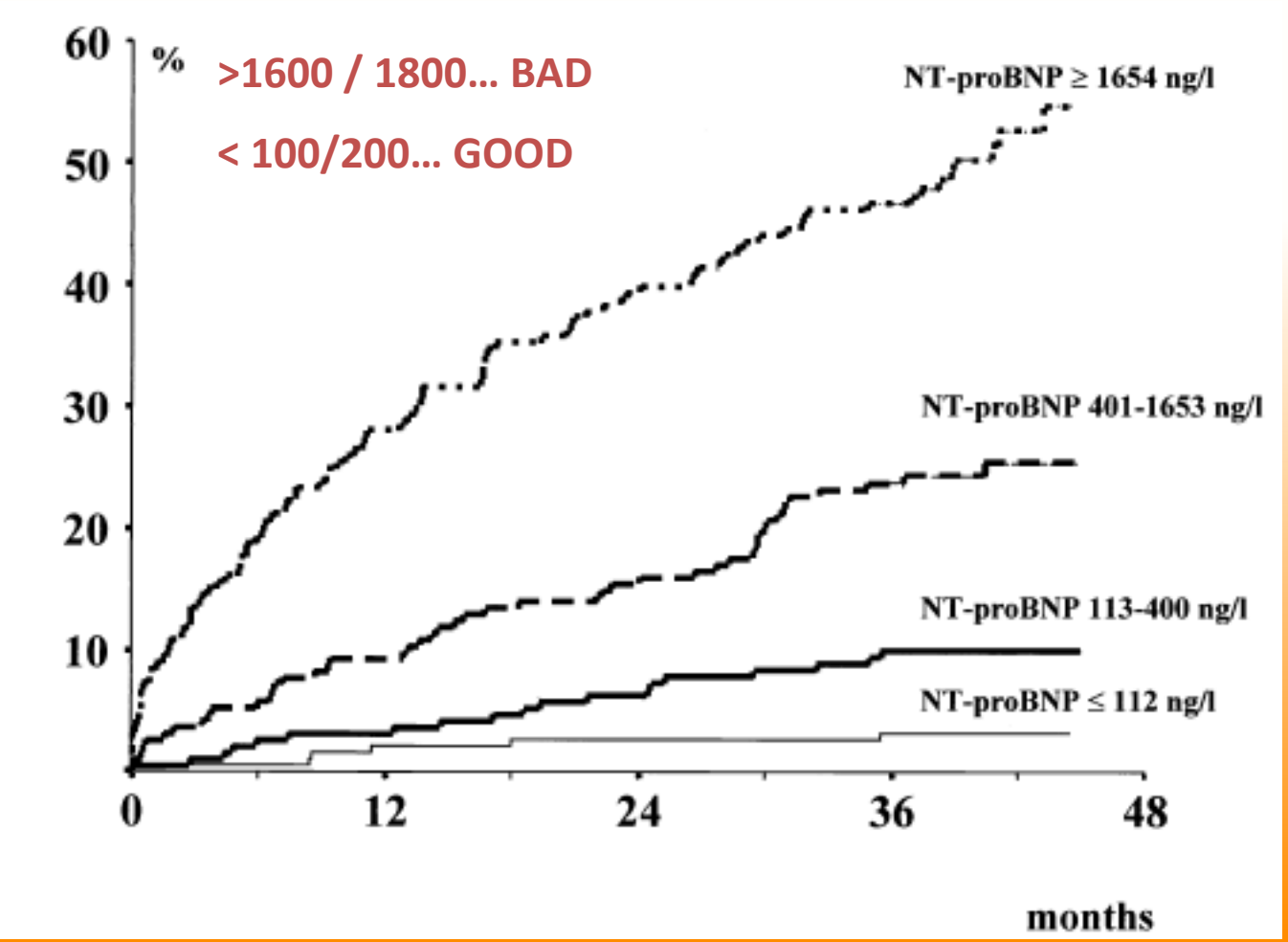
Le NT-ProBNP est un marqueur indépendant de risque de déçès independent de la stratégie invasive

Table 3. Predictors of Death

	Univariate Analysis	Multivariate Analysis	
	RR (95% CI)	Model 1 OR (95% CI)	Model 2 OR (95% CI)
Noninvasive strategy			
Age ≥70 yrs	2.75 (1.73–4.39)	2.54 (1.46–4.70)	2.22 (1.22–4.02)
Male	1.22 (0.72–2.04)	NS	NS
Diabetes mellitus	3.46 (2.13–5.62)	3.40 (1.83–6.56)	3.09 (1.55–6.16)
Previous MI	2.15 (1.33–3.46)	2.15 (1.23–3.76)	2.53 (1.39–4.60)
ST-segment depression at entry	2.30 (1.40–3.79)	NS	NS
Troponin T ≥0.03 μg/l	1.59 (0.88–2.92)	NS	NS
Interleukin-6 ≥5 ng/l	2.72 (1.68–4.42)	2.68 (1.56–4.60)	1.68 (0.92–3.09)
NT-proBNP (third tertile)	4.14 (2.38–7.25)	—	3.76 (1.95–7.25)
Invasive strategy			
Age ≥70 yrs	3.33 (1.83–6.06)	2.25 (1.13–4.49)	NS
Male	0.50 (0.28–0.88)	0.48 (0.25–0.95)	0.52 (0.25–1.06)
Diabetes mellitus	3.80 (2.11–6.85)	4.76 (2.37–9.58)	4.80 (2.30–10.0)
Previous MI	5.10 (2.85–9.09)	4.54 (2.32–8.91)	3.97 (1.95–8.11)
ST-segment depression at entry	2.75 (1.50–5.13)	3.28 (1.54–6.97)	2.86 (1.33–6.19)
Troponin T ≥0.03 μg/l	1.30 (0.66–2.57)	NS	NS
Interleukin-6 ≥5 ng/l	1.24 (0.65–2.37)	NS	NS
NT-proBNP (third tertile)	3.55 (1.85–6.80)	—	3.13 (1.50–6.51)

CI = confidence interval; OR = odds ratio; RR = risk ratio; other abbreviations as in Table 1.

Le NT-proBNP post SCA
Une zone grise ?



JACC Vol. 40, No. 3, 2002
August 7, 2002:437–45

(*Circulation*. 2003;108:275-281.)

Mortalité Post SCA dépend du NT-proBNP

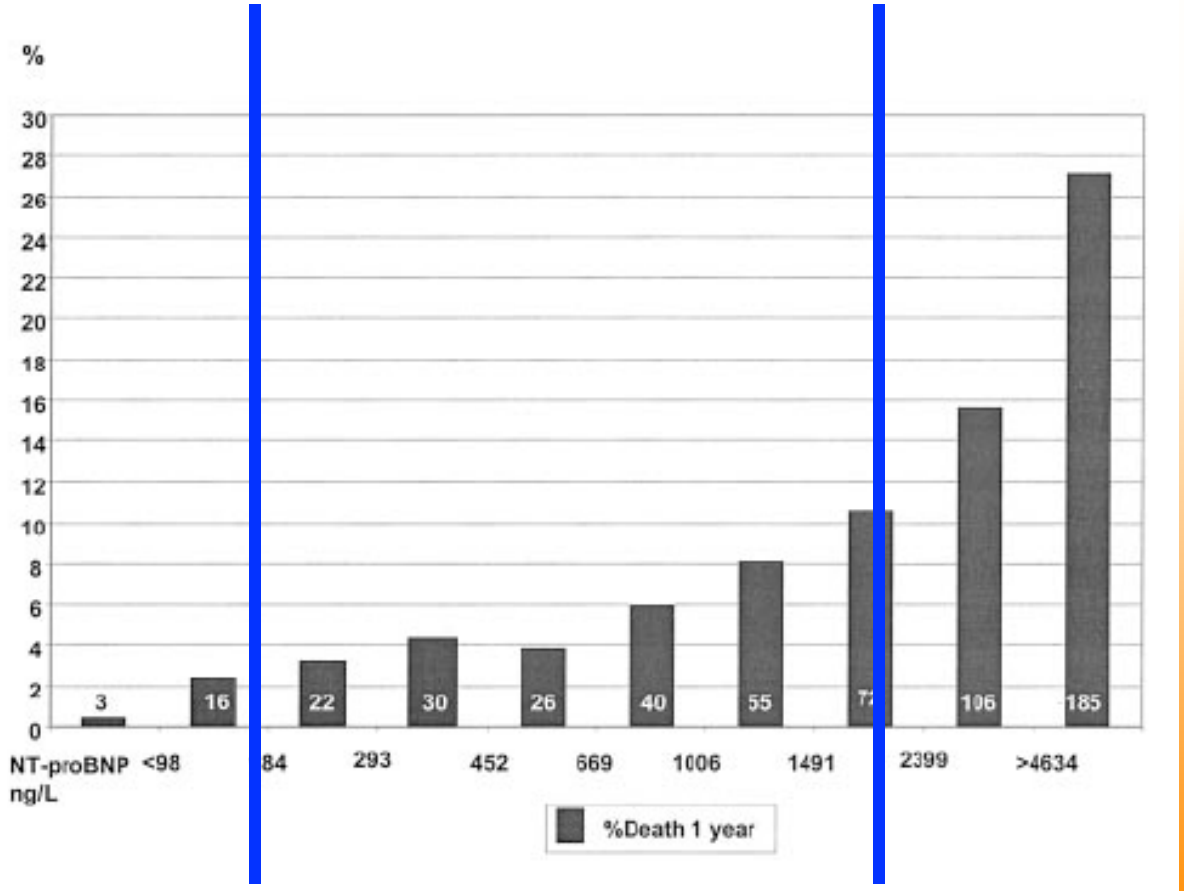
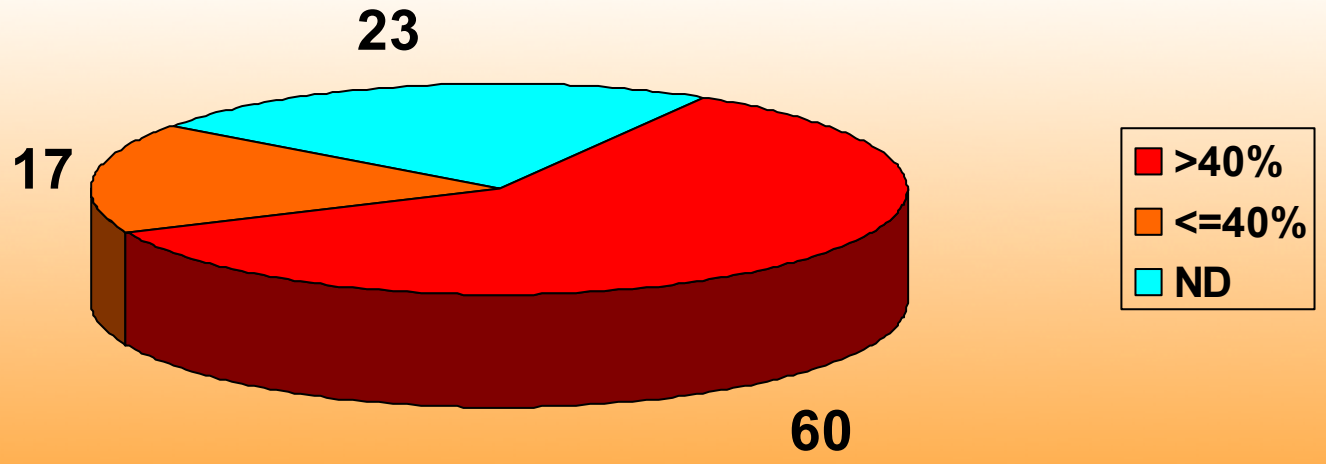


Figure 2. Mortality at 1-year follow-up among strata of patients, according to deciles of NT-proBNP levels. Number of deaths in each decile is given at the bottom of the bars.

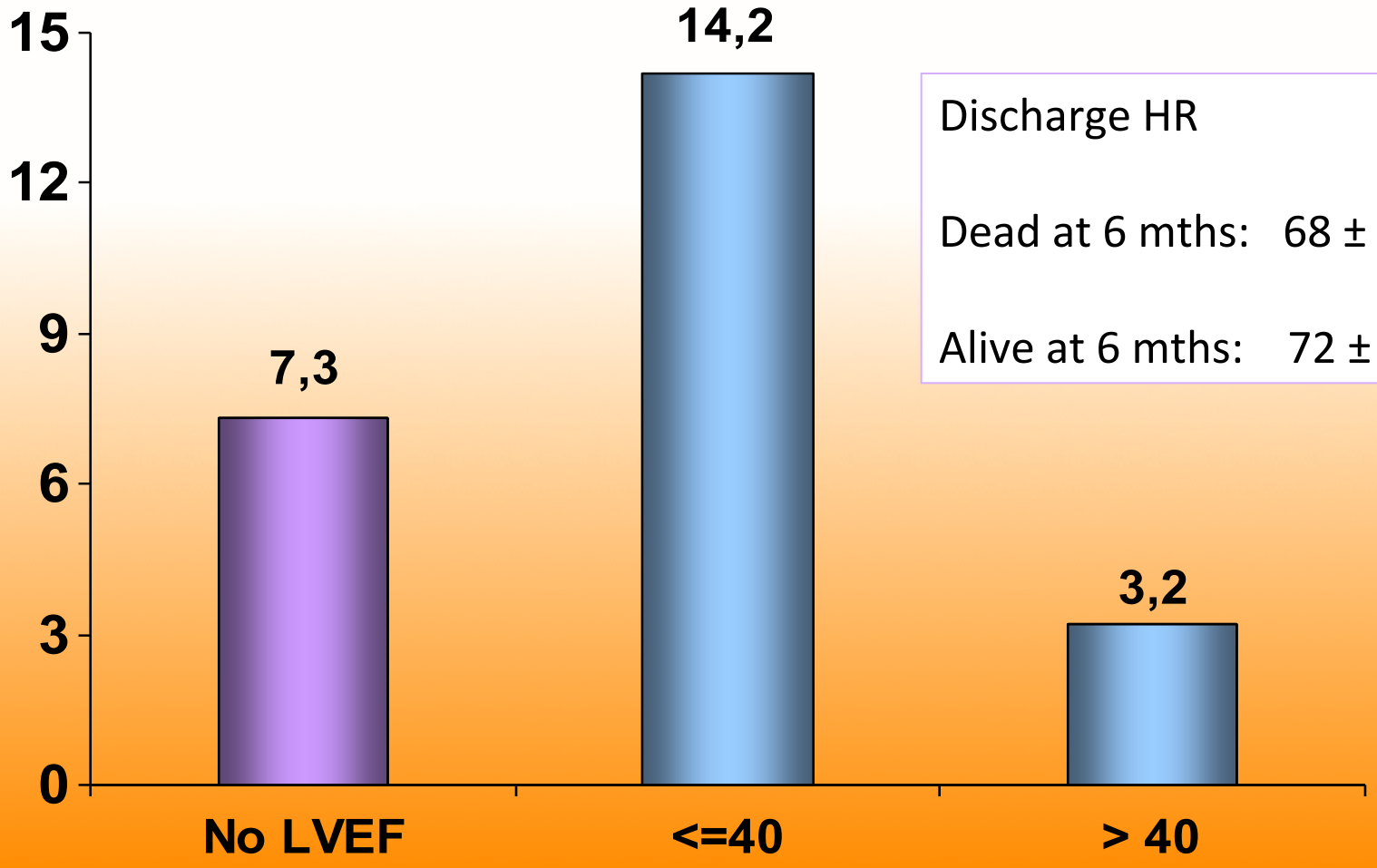
PEPTIDES NATRIURETIQUE/SCA/FEVG

LVEF during initial hospitalisation



FAST MI courtesy of N Danchin

6-month mortality according to LVEF (hospital survivors)



Discharge HR

Dead at 6 mths: 68 ± 12

Alive at 6 mths: 72 ± 13

FAST MI courtesy of N Danchin

Le NT-proBNP est corrélé à la fonction VG post infarctus…

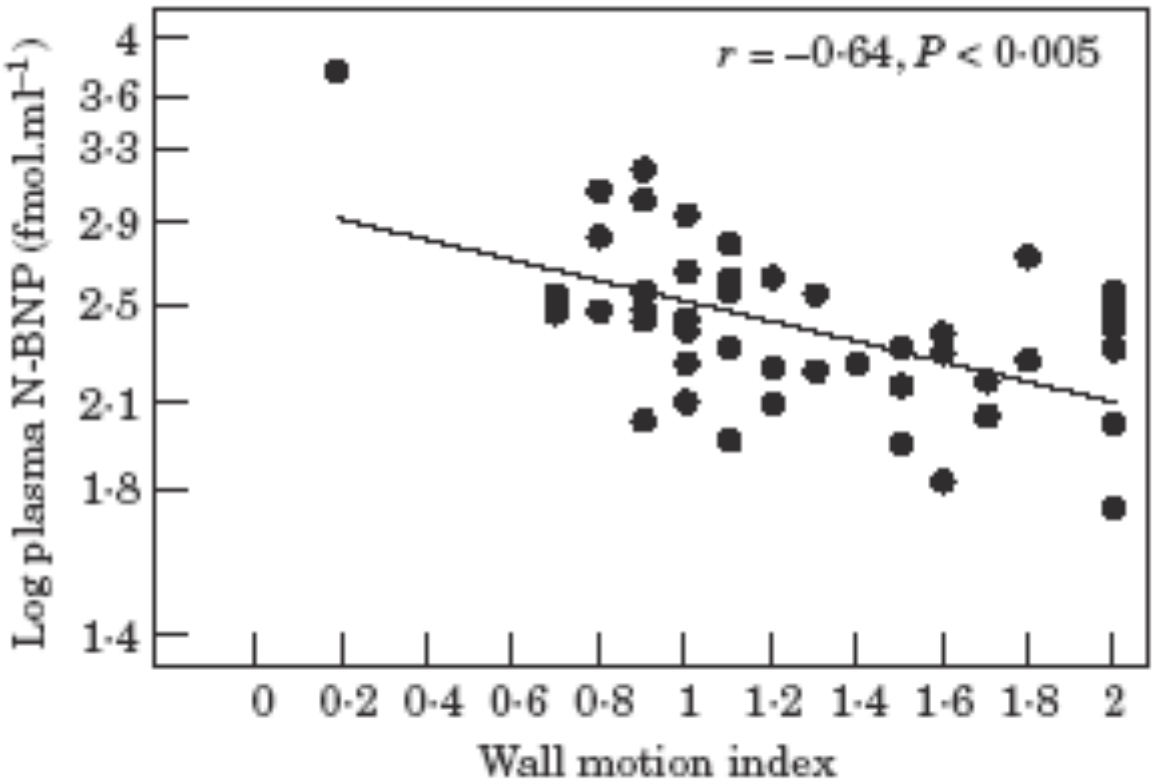


Figure 2 **Correlation of wall motion index during hospitalization and N-BNP measured at 73–120 h following myocardial infarction.**

European Heart Journal (2000) **21**, 1514–1521

NT pro BNP et pronostique

Table 2 Sensitivity, specificity, positive predictive value and negative predictive values of clinical heart failure, radiological heart failure and plasma N-BNP at 73–120 h following myocardial infarction for the prediction of death or WMI-2 ≤1·2

	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)
Clinical heart failure	63	70	45	82
Radiological heart failure	63	48	48	76
Both clinical and radiological heart failure	75	42	34	81
N-BNP >240 (fmol . ml $^{-1}$)	85	56	41	

VPN:91%

European Heart Journal (2000) 21, 1514–1521

Cinétique du NT-proBNP selon la localisation d'un IDM

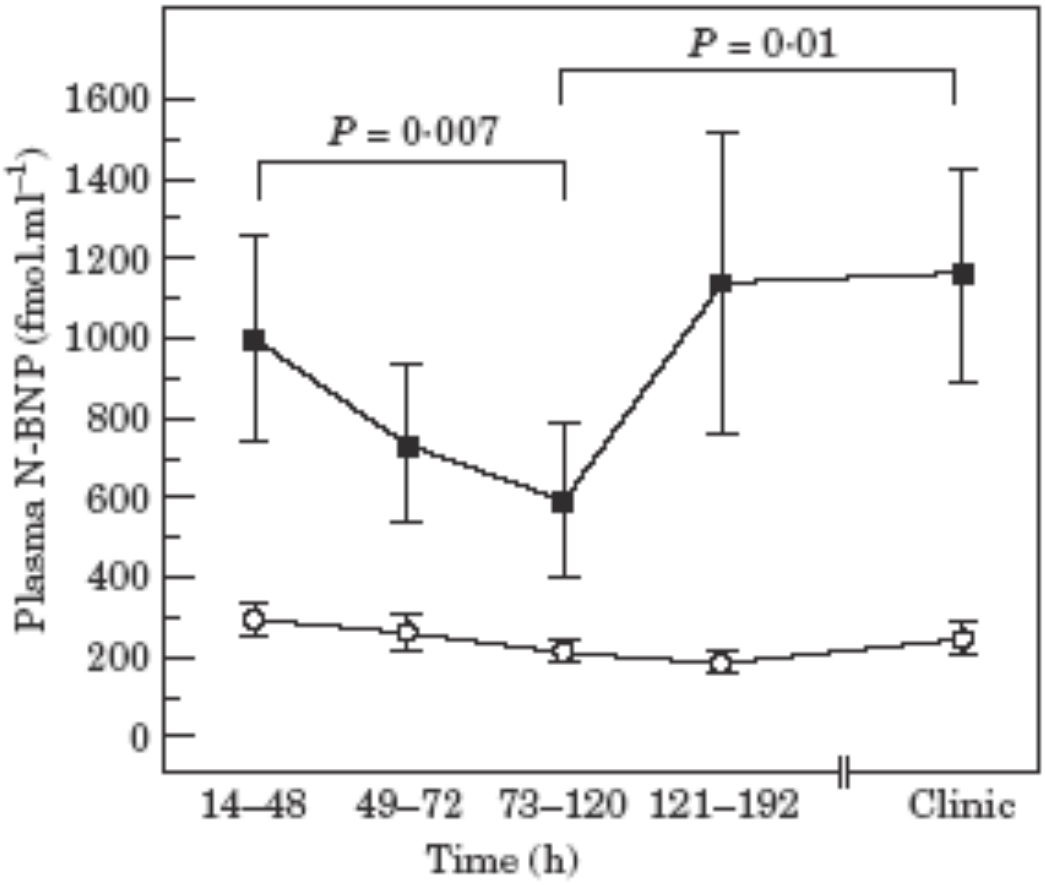
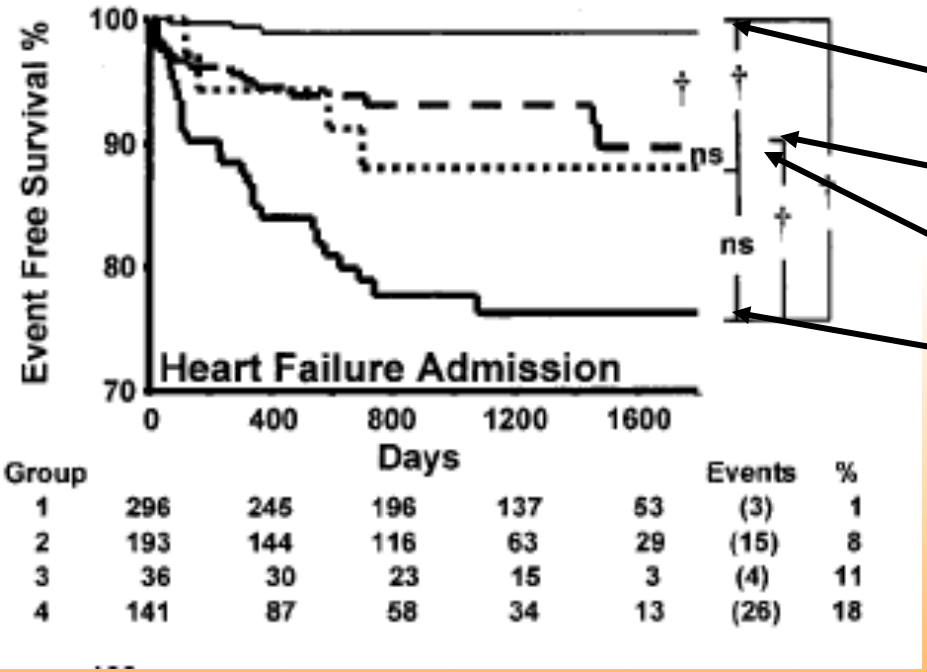


Figure 1 Profile of plasma N-BNP (mean ± 1 SD) following anterior (■) or inferior (○) myocardial infarction.

European Heart Journal (2000) **21**, 1514–1521

NT-proBNP et FEVG, un couple gagnant?



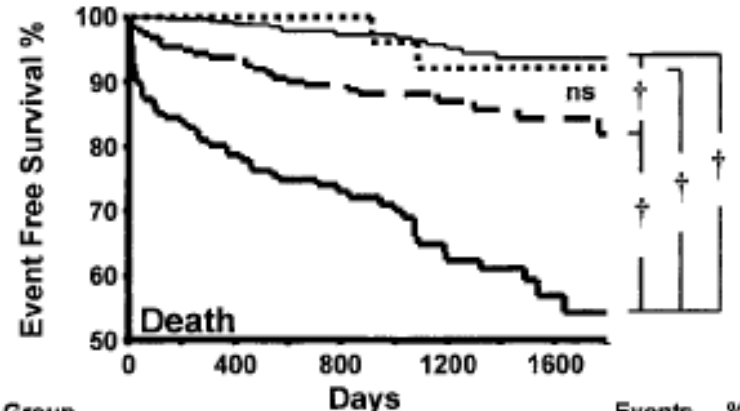
Group					Events	%
1	296	245	196	137	53	(3)	1
2	193	144	116	63	29	(15)	8
3	36	30	23	15	3	(4)	11
4	141	87	58	34	13	(26)	18

FEVG > 40% NT < médiane

FEVG > 40% NT > médiane

FEVG < 40% NT < médiane

FEVG < 40% NT > médiane



Group					Events	%
1	296	248	198	138	53	(14)	5
2	193	154	125	70	34	(27)	14
3	36	31	26	18	6	(2)	6
4	141	103	73	46	22	(52)	37

Circulation. 2003;107:2786-2792.

L'analyse du NT est plus performante que l'analyse isolée de la FEVG.

TABLE 2. Clinical Events According to LVEF and Plasma N-BNP

		LVEF				N-BNP			
		<40% (n=177)		≥40% (n=489)		>Median (n=332)		≤Median (n=334)	
	Total Events, n	n (%) of Subgroup	(% of Events)	n (% of Subgroup)	(% of Events)	n (% of Subgroup)	(% of Events)	n (% of Subgroup)	(% of Events)
Death	95	54 (31)*	57	41 (8)	(43)	79 (24)†	83	16 (5)	(17)
HF readmit	48	30 (17)†		18 (4)	(37)	41 (12)†		7 (2)	(15)
Death/HF	126	72 (41)†	63	54 (11)	(43)	104 (31)†	85	22 (7)	(17)
MI	118	41 (23)*		77 (16)	(65)	67 (20)*		51 (15)	(43)
ACS	235	NS 71 (40)	57	164 (34)	(70)	132 (40)‡	83	103 (31)	(44)

HF indicates heart failure; ACS, acute coronary [illegible] myocardial infarction; and NS, not significant.
Statistical significance of Kaplan-Meier event- [illegible] ation for each clinical end point (comparing those [illegible] ≥40% and those with plasma N-BNP > vs < median)
*$P<0.05$; †$P<0.001$; ‡$P<0.01$.

35

54

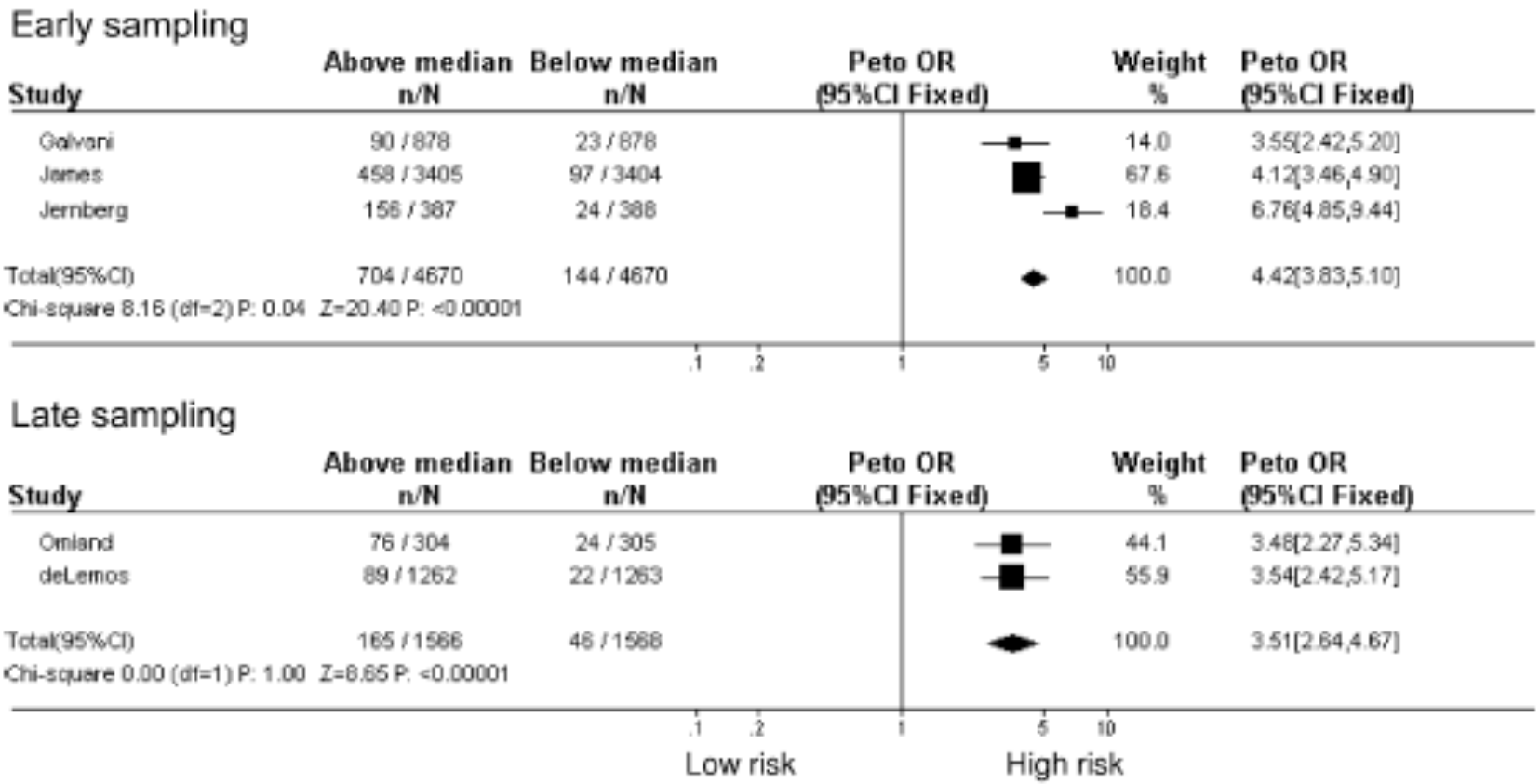
30

56

Circulation. 2003;107:2786-2792.

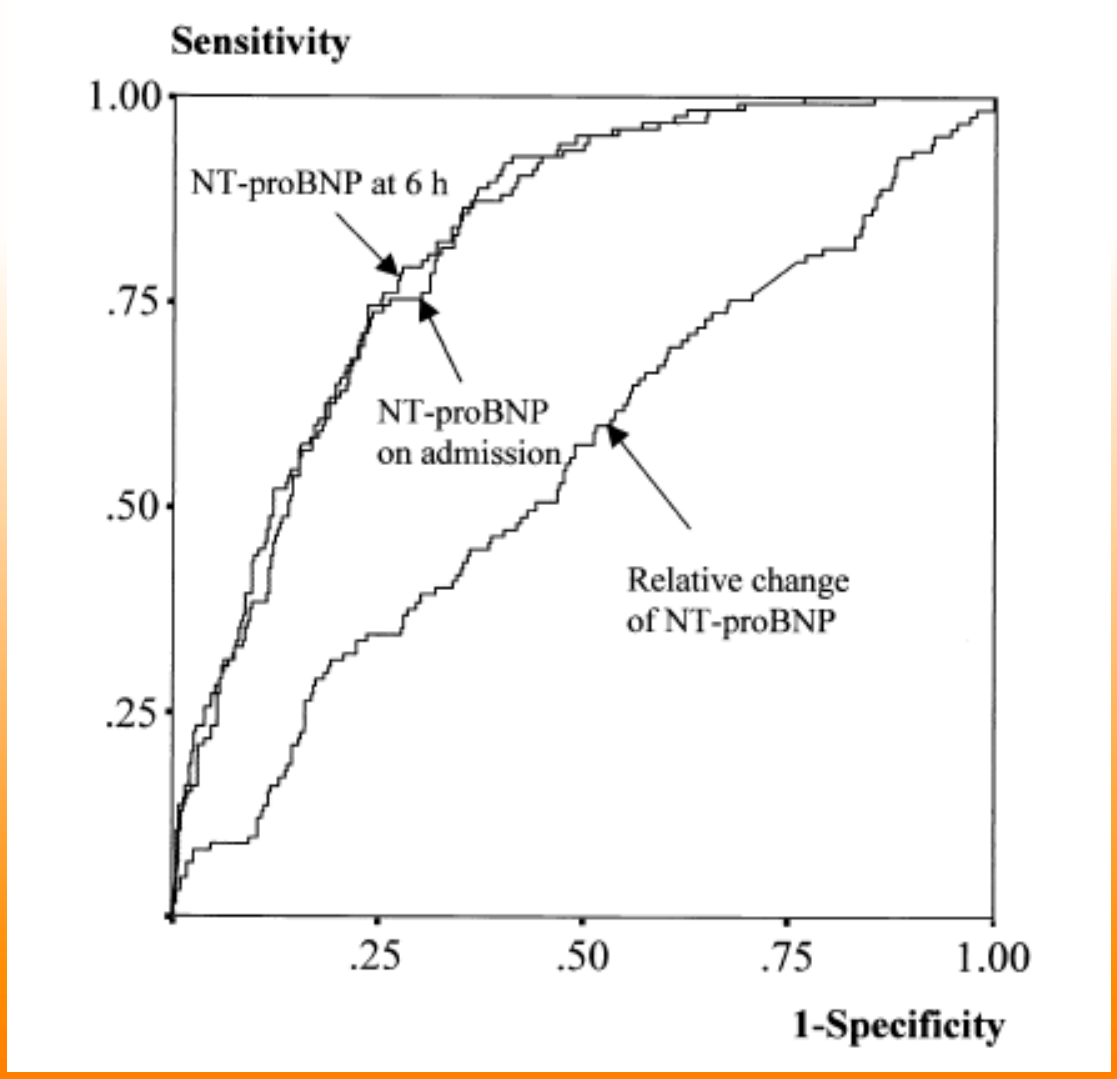
PEPTIDES NATRIURETIQUE/SCA
QUAND?
COMMENT?

Dosage du NT-PROBNP : Avant ou après la 24e heure?



M. Galvani et al. / The European Journal of Heart Failure 6 (2004) 327–333

Variation ou taux brut ?



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PEPTIDES NATRIURETIQUE / ANGOR STABLE

NT-proBNP et angor stable

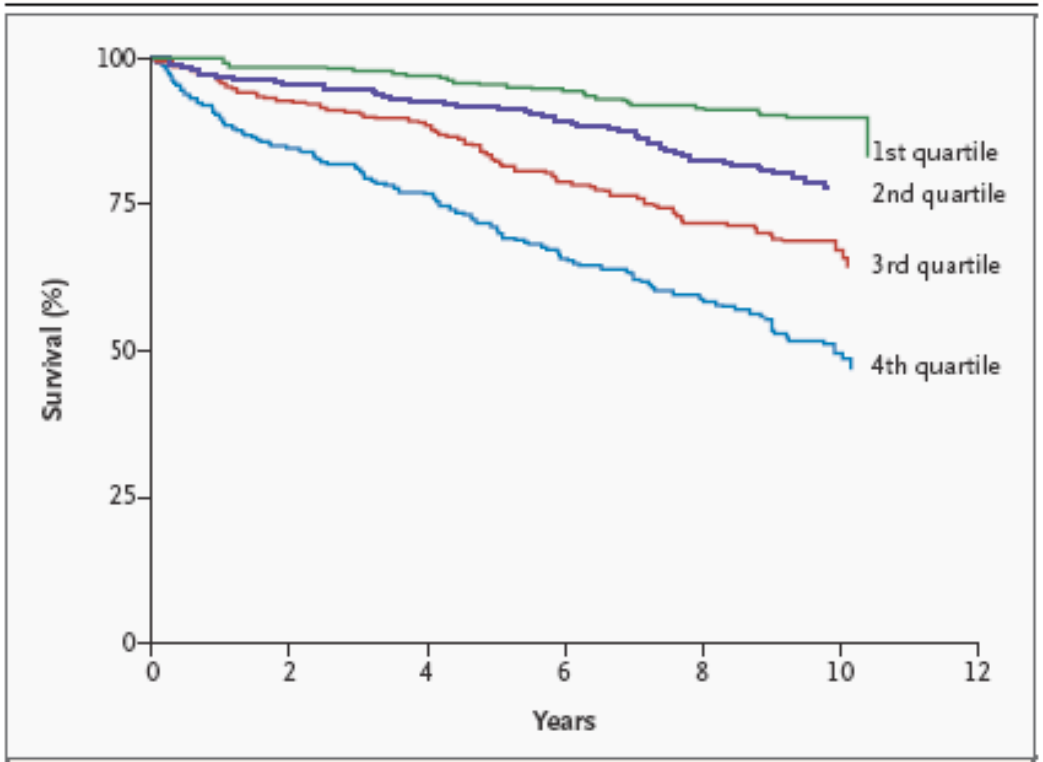


Figure 1. Overall Survival among Patients with Stable Coronary Artery Disease, According to Quartiles of NT-pro-BNP.

The NT-pro-BNP levels were as follows: first quartile, less than 64 pg per milliliter; second quartile, 64 to 169 pg per milliliter; third quartile, 170 to 455 pg per milliliter; and fourth quartile, more than 455 pg per milliliter. P<0.001 by the log-rank test for the overall comparison among the groups.

Un marqueur indépendant

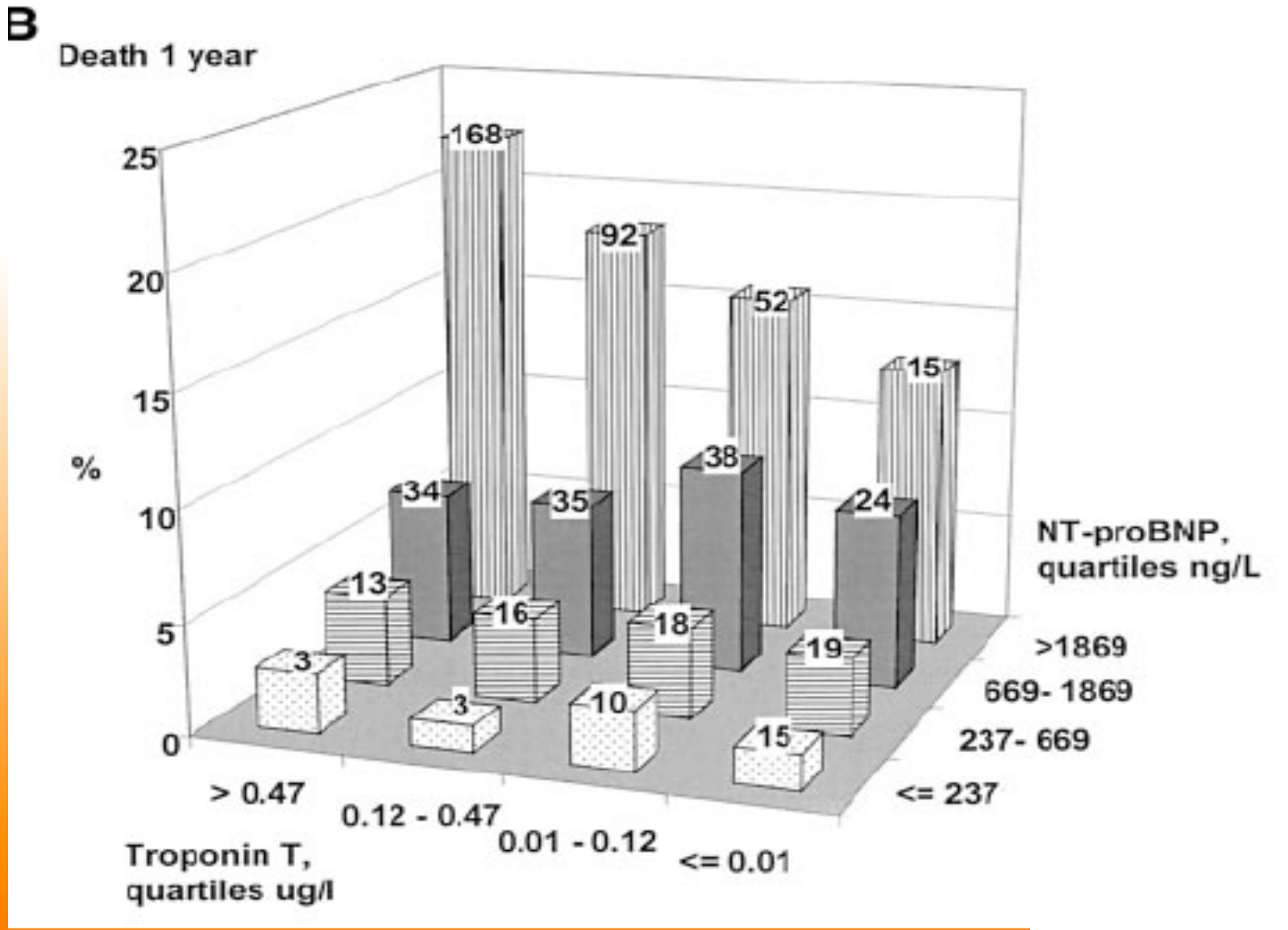
Table 3 Hazard Ratios for Death from Any Cause in the Multivariable Model.*

Variable	Hazard Ratio (95% CI)	P Value
NT-pro-BNP (4th vs. 1st quartile)	2.4 (1.5–4.0)	<0.001
Age (per 10-yr increase)	1.6 (1.4–1.9)	<0.001
Diabetes	1.7 (1.3–2.2)	<0.001
Cigarette smoking	1.6 (1.2–2.0)	<0.001
CAD (severe vs. none)†	1.8 (1.2–2.6)	0.002
LVEF (per 10% decrease)	1.2 (1.1–1.4)	<0.001
Suspected heart failure	1.8 (1.4–2.4)	<0.001

TROPONINE OU BNP…

LES DEUX

Troponin + NT pro-BNP



(*Circulation*. 2003;108:275-281.)

LES QUESTIONS
LA CONCLUSION

Les questions

- BNP ou NT-proBNP ?
- Influence de l'âge et du sexe
- Insuffisance rénal et NT-ProBNP
- Obésité

conclusion

- L'intérêt du dosage des peptides natriurétiques dans le SCA est désormais bien documenté
- Utilisation en combinaison avec la troponine parait la plus performante
- Permet de « rattraper » des patients à risque et troponine normale
- Reste le problème de la spécificité de ces peptides

MERCI DE VOTRE ATTENTION