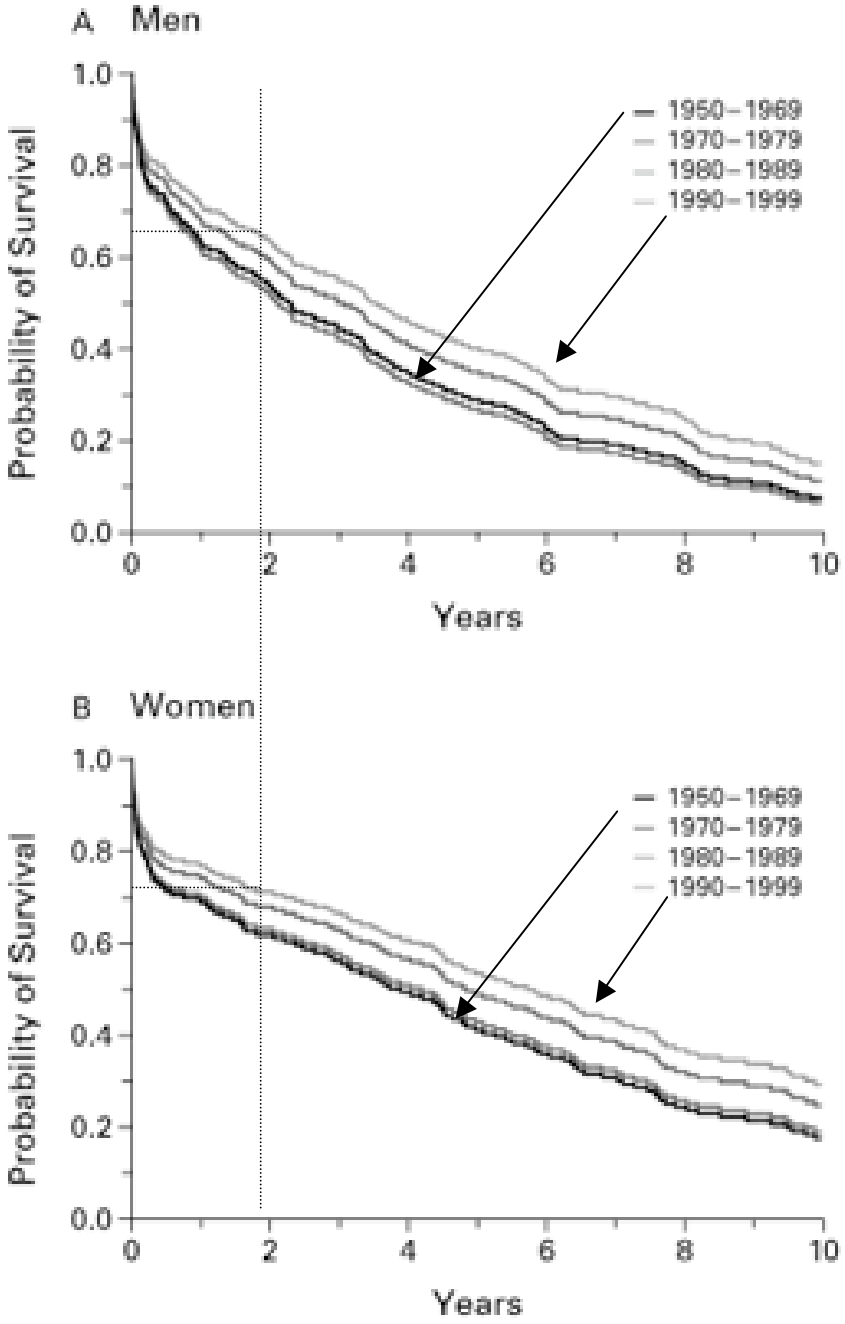
# Anesthésie de l’insuffisance cardiaque

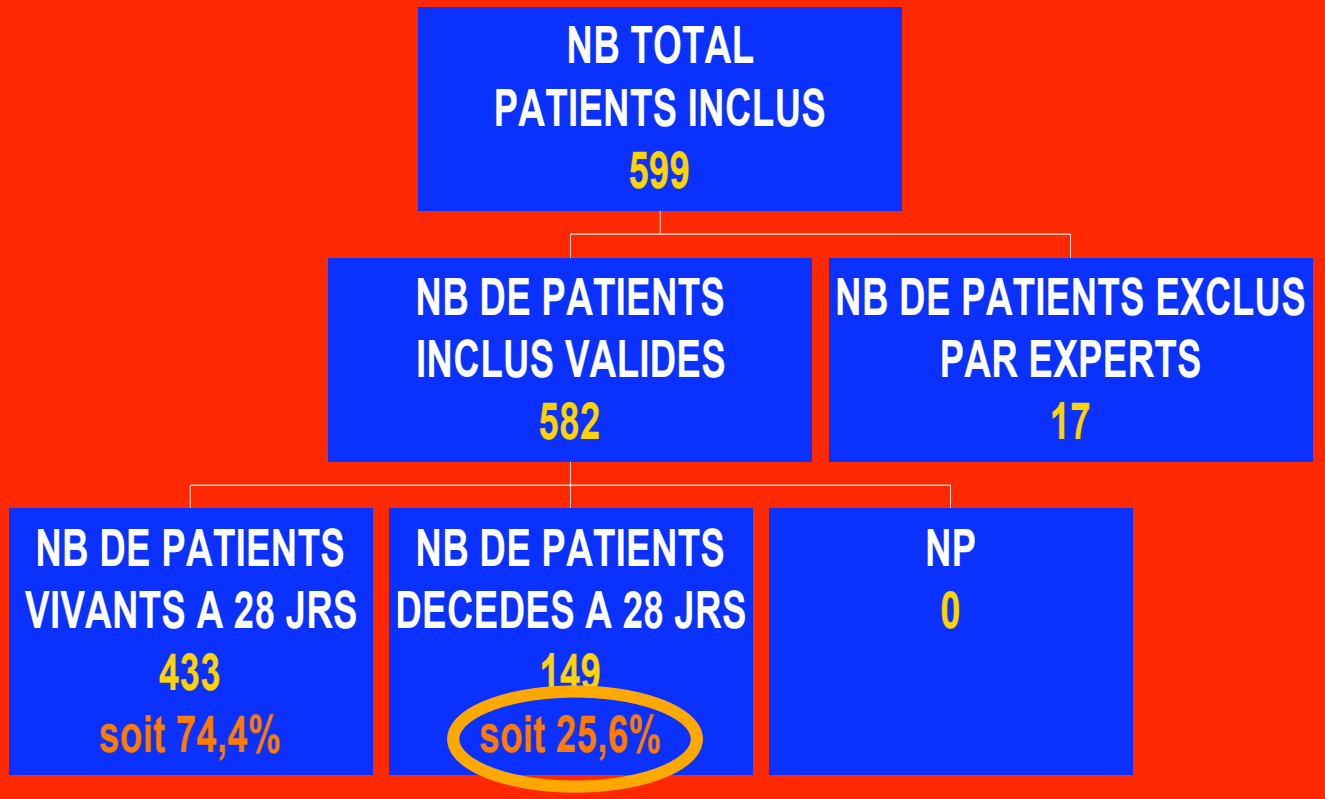



**There are differences all along the time and between men and women in CHF related mortality**

*Levy NEJM 2002, 347, 1397-402*

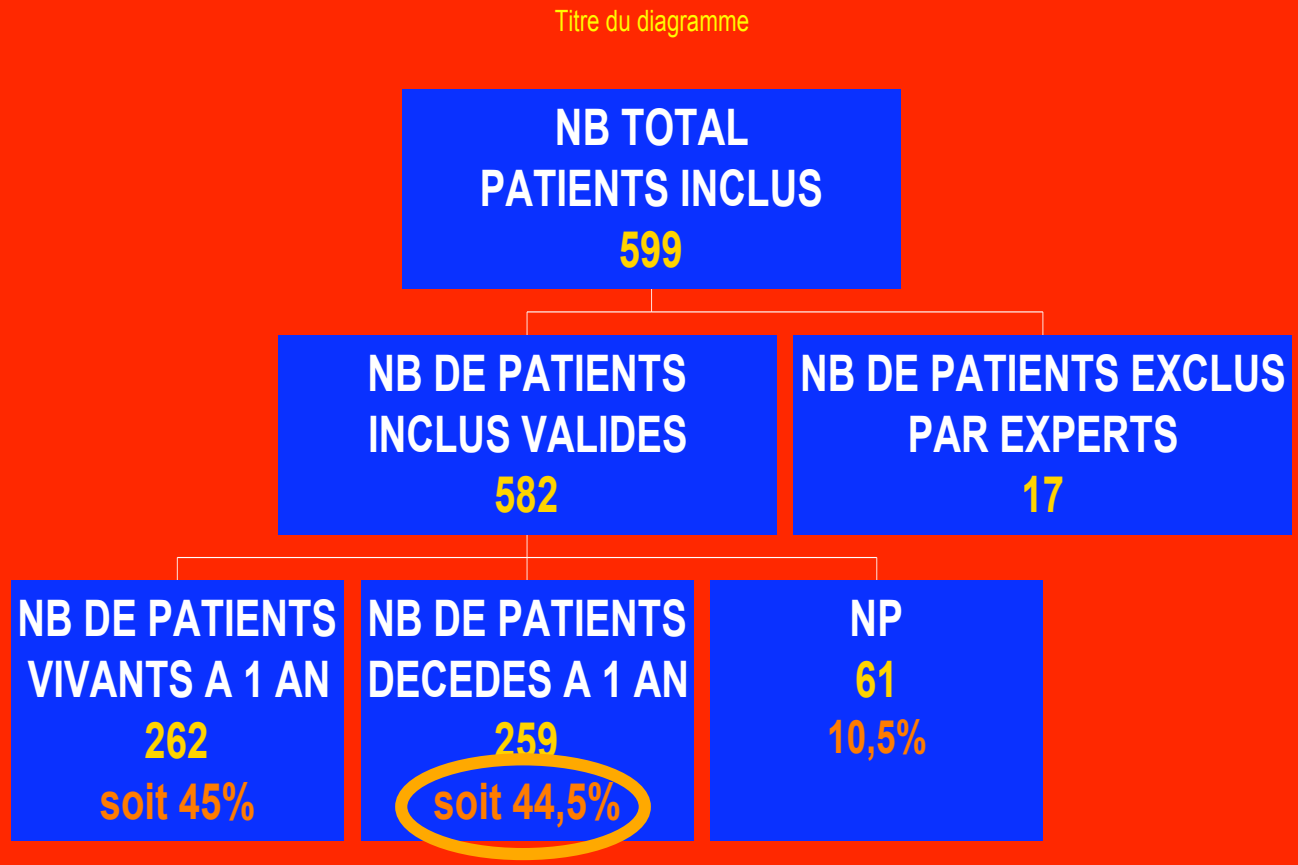
# RESULTATS

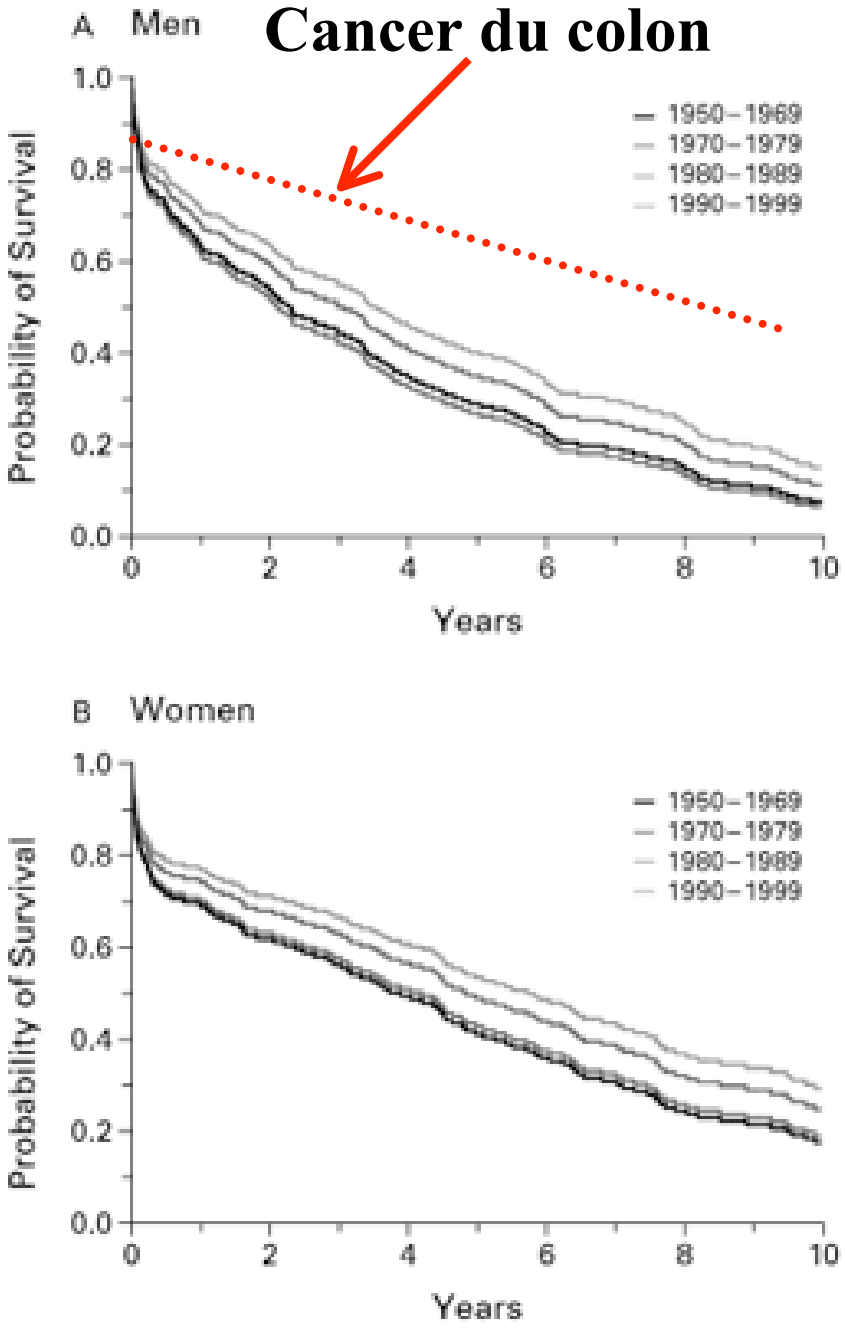
- Patients décédés à 28 jours



# RESULTATS

- Patients décédés à 1 an



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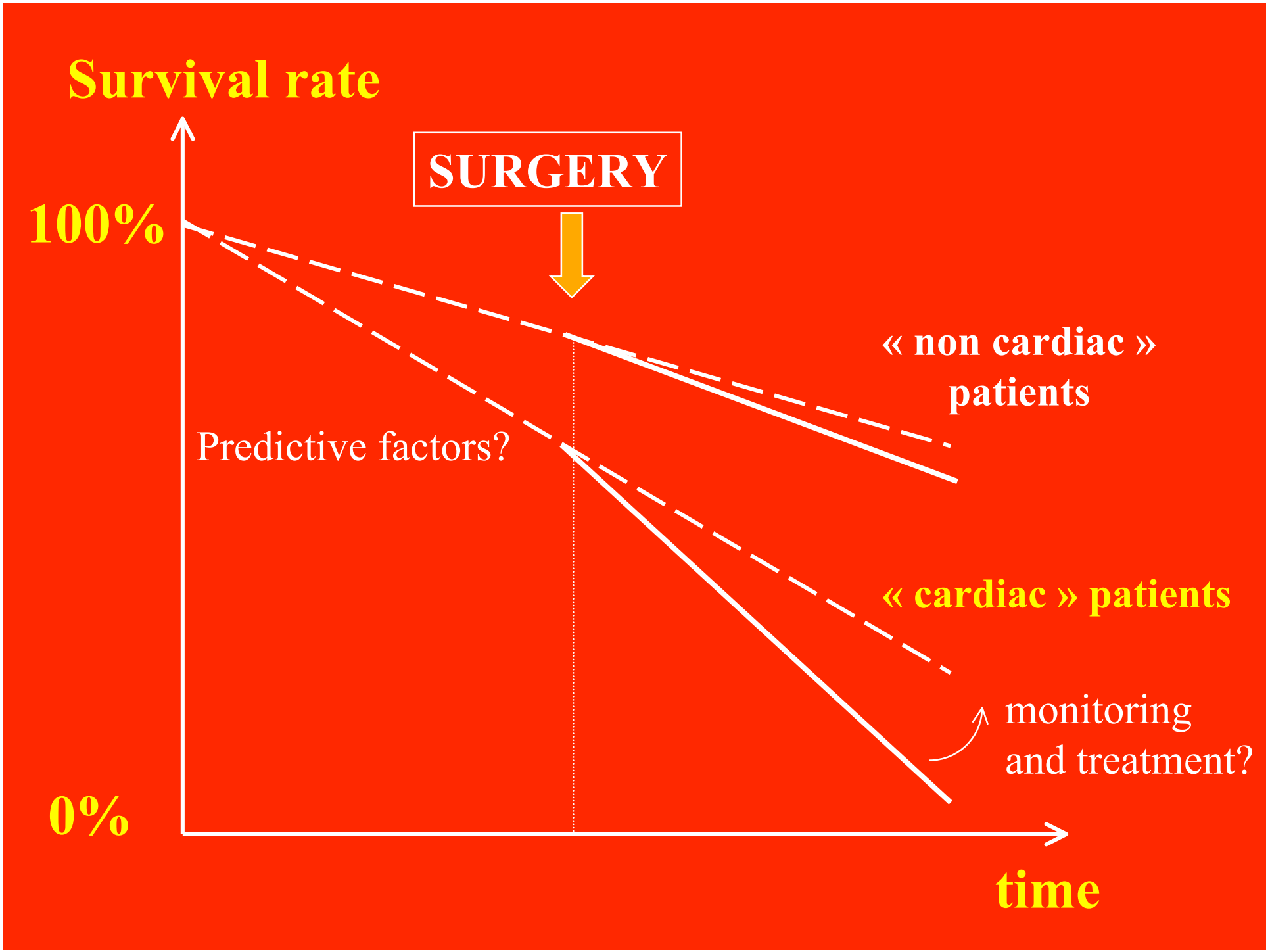
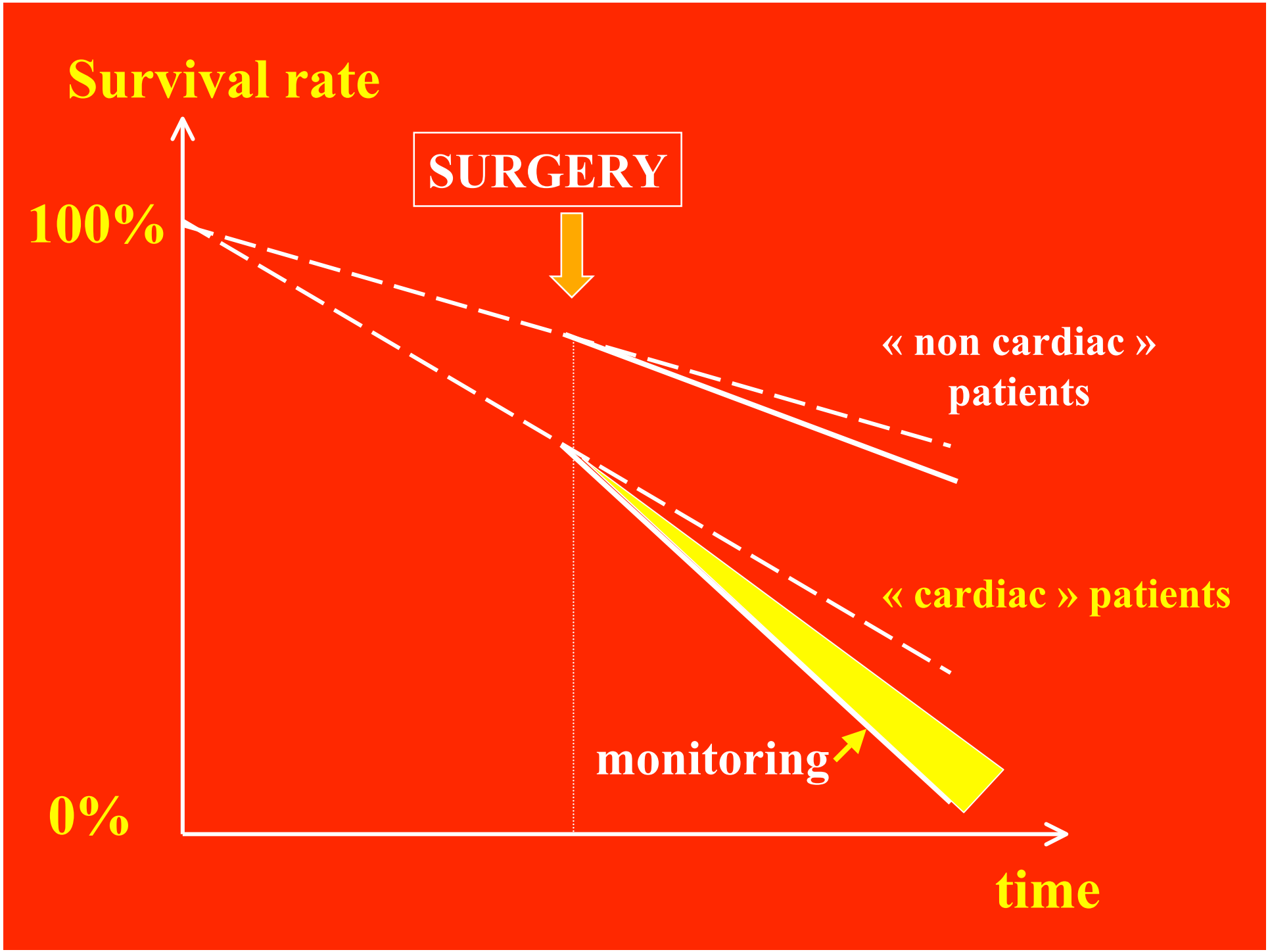

Survival rate
SURGERY
100%
« non cardiac »
patients
Predictive factors?
« cardiac » patients
monitoring
and treatment?
0%
time


Survival rate
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# Predictive factors

- = probability of coronary artery disease and/or congestive heart failure

- Assessment
  - by history, pre-operative risk factors
  - by exercice tolerance
  - by testing, to better confirm and define cardiovascular disease

# Multivariable models to predict perioperative cardiac death or myocardial infarction

| | Odds ratio | p value |
|---|---|---|
| Prior cerebrovascular accident | 3.4 | . 001 |
| Perioperative □-blocker therapy | 0.3 | . 009 |
| Congestive heart failure | 3.0 | . 009 |
| Prior myocardial infarction | 2.5 | . 01 |
| Current stable angina or prior angina | 2.1 | . 03 |
| Age ≥ 70 y | 1.9 | . 05 |

# Importance de la tolérance à l ’exercice

1

. Autonome
. Marche dans la maison
. Fait ses courses à pied
. Travaux ménagers minimes

4 METs

4

. Monte des marches ou une colline
. Marche à pied (6 km/heure)
. Court pour attraper un bus
. Travaux ménagers majeurs
. Sport à effort modéré (golf,bowling,…)
. Sport à effort important (foot, tennis,…)

10

**MET = équivalent métabolique**

*Circulation 1996, 93;6:1278-317*

## INTERROGATOIRE

- Infarctus du myocarde
- Angor
- Diabète
- AVC/AIT
- **TOLERANCE A L'EFFORT**

**Si négatif, 96% de VPP**

## EXAMEN CLINIQUE

- Galop
- Distension des jugulaires

**30% des OAP**

- Walk-test: 6 minutes  300 mètres

## NORMALEMENT

**INTERROGATOIRE**

**EXAMEN CLINIQUE**

**+ 95% des patients**

# MALADIE CORONARIENNE

**SILENCIEUSE** +++ même chez les non diabétiques

→ Difficile de diagnostiquer, donc traitement tardif

→ Le plus souvent insuffisance ventriculaire

Droite / Gauche / Bilatérale

→ L'apparition d'une ischémie → hausse de la mortalité à 1,2 et 5 ans (X 2 et plus)

# EN CAS DE VALVULOPATHIES

**<u>Chirurgie cardiaque</u>** : RVM

PAC

Mortalité > RVAo

**<u>Chirurgie non cardiaque</u> :**

RAo, mortalité 20 % < coronarien et MM

# EXAMENS COMPLEMENTAIRES

**Doit être exceptionnel**

**ECG** : repos + ECG d'effort

**Scinti au thallium dipyridamole** = moins bon que l'examen clinique

**Echo** : ne prédit pas la survenue de problèmes péri-opératoires

**Si insuffisance cardiaque :**

VG = fonctions systolique et diastolique

- FEVG
  - Obstruction Ao
  - Obstruction sous-Ao
- Flux de remplissage nitral

VD : Taille, paroi libre, taille OD, VCI, PAP
(ex : ciment et orthopédie)

**Coro** : aujourd'hui exceptionnel

# EVALUATION PRE-OPERATOIRE D'UN PATIENT INSUFFISANT CARDIAQUE

Préciser le risque individuel en fonction de la chirurgie

 améliorer la prise en charge

IC d'origine cardiaque
(valvulaire / cardiomyopathie)
**PER OPERATOIRE**

IC d'origine ischémique

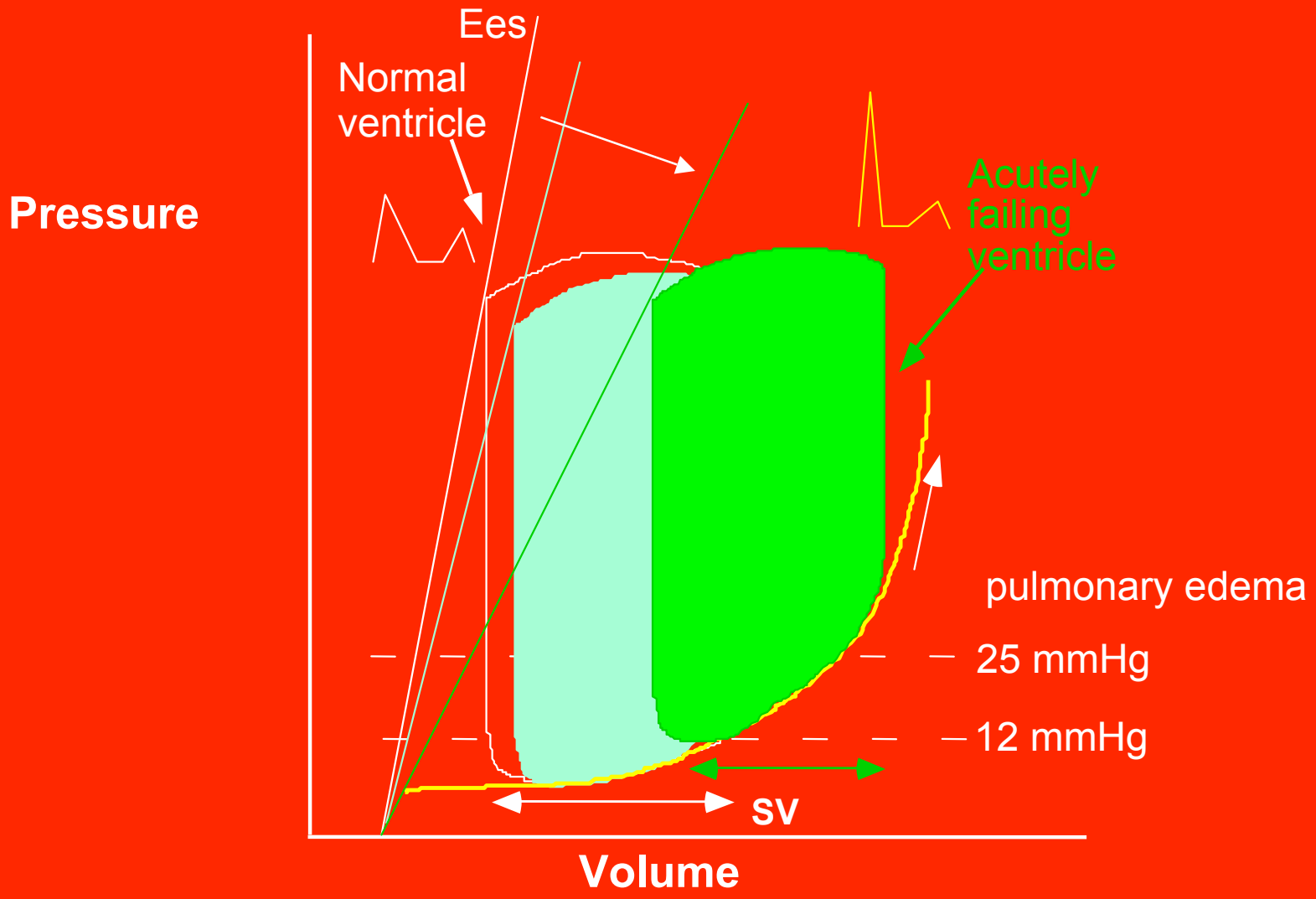
**1) SILENCIEUX**
**2) 12° - 36° heure**
**3) Pronostic + défavorable**

**MONITORAGE**

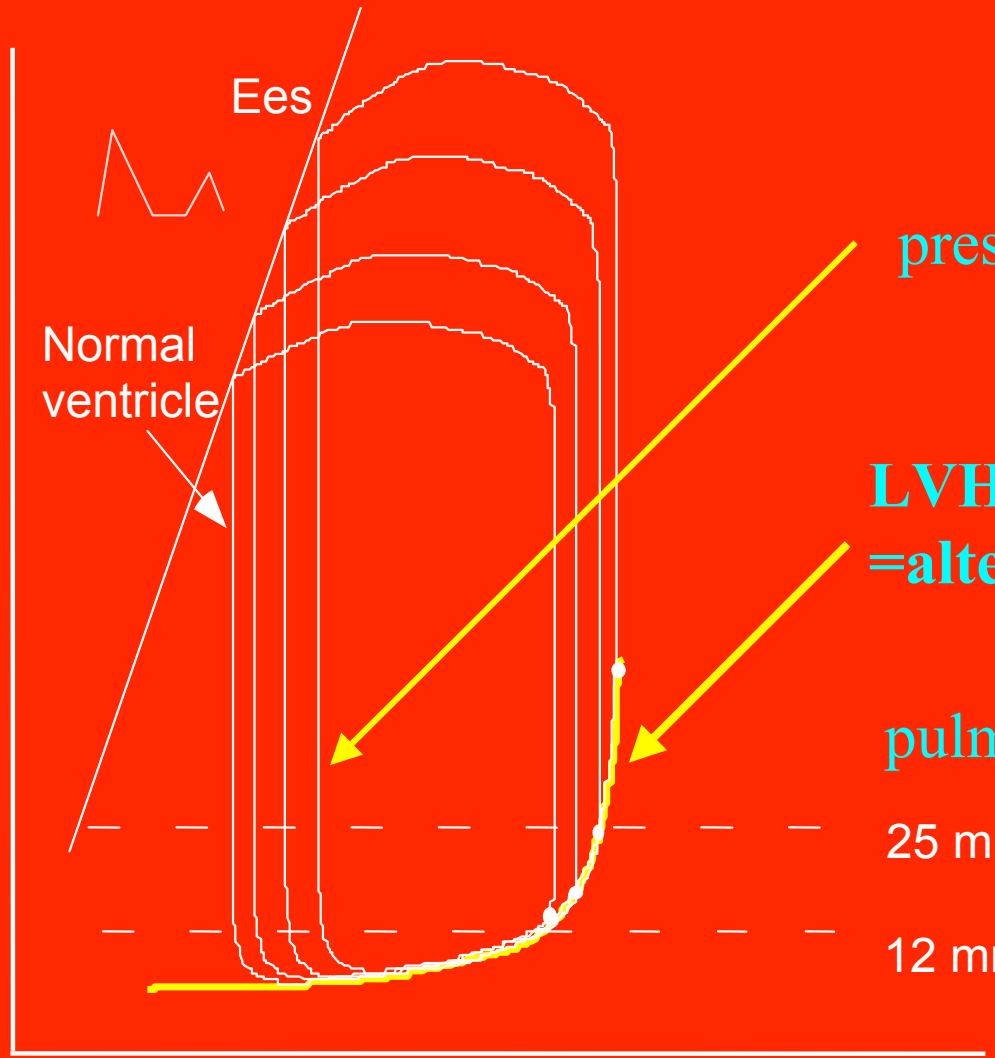
**TERRAIN**

**RISQUE OPERATOIRE**

# Mechanism 1: decrease in inotropy (systolic function) + alteration in diastolic function = CHF



# Mechanism 2: diastolic dysfunction by increased afterload



# Pathogenesis of acute pulmonary edema during hypertension

**Pulmonary edema:**

- is a sign of pulmonary congestion = increased Pcwp = LAP = LVEDP
- is a sign of diastolic dysfunction and not a direct sign of systolic dysfunction

***SK Ghandi, NEJM 2001, 344: 17-22***

| Variable | During Acute Pulmonary Edema | After Treatment |
|---|---|---|
| | mean ±SD | |
| Blood pressure (mm Hg) | | |
| Systolic | 200±26 | 139±17* |
| Diastolic | 100±25 | 64±15* |
| Heart rate (beats/min) | 83±14 | 72±12* |
| Mitral flow velocity (cm/sec) | | |
| E wave | 98±33 | 98±28 |
| A wave | 88±33 | 78±26* |
| E wave:A wave | 1.31±0.80 | 1.51±0.97* |
| E-wave deceleration time (msec) | 174±62 | 194±62* |
| Isovolumic relaxation time (msec) | 78±19 | 75±25 |
| Left ventricular volume (ml) | | |
| End diastolic | 109±43 | 117±50 |
| End systolic | 58±32 | 61±37 |
| Left ventricular ejection fraction | 0.50±0.15 | 0.50±0.13 |
| Left ventricular wall thickness (mm) | | |
| Posterior | 12.8±2.9 | 12.8±3.1 |
| Septal | 12.5±3.7 | 12.9±3.6 |
| Left ventricular dimension (mm) | | |
| End diastolic | 49.7±9.5 | 49.4±9.8 |
| End systolic | 38.3±10.1 | 38.3±10.7 |

*P<0.05 for the comparison with the value during the acute episode.

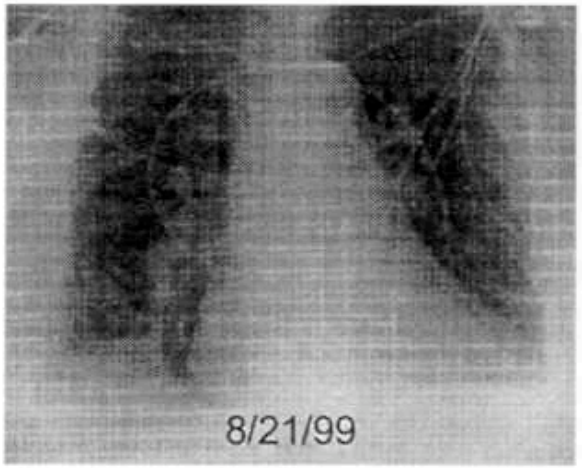
*SK Ghandi, NEJM 2001, 344: 17-22*

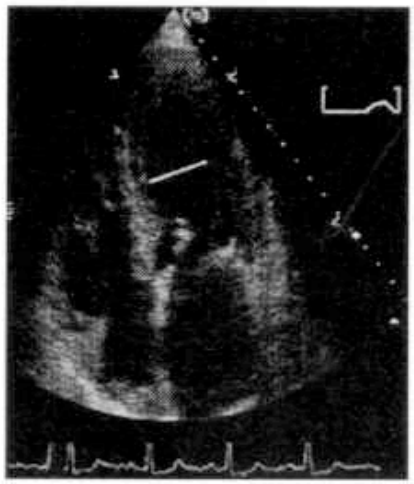
During Acute Pulmonary Edema

Blood pressure, 240/144 mm Hg


After Treatment

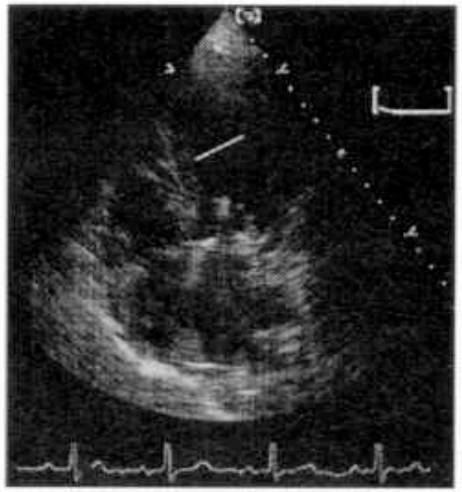
Blood pressure, 149/75 mm Hg



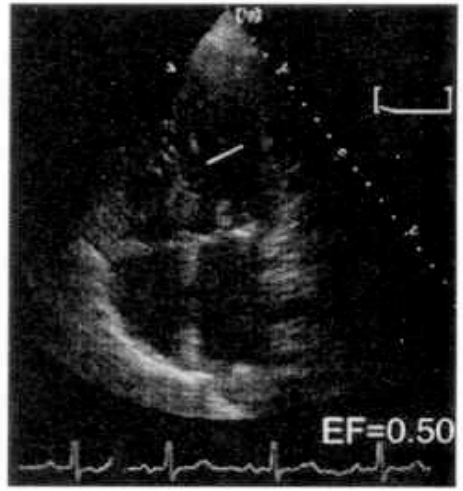



End Diastole


End Systole



End Diastole



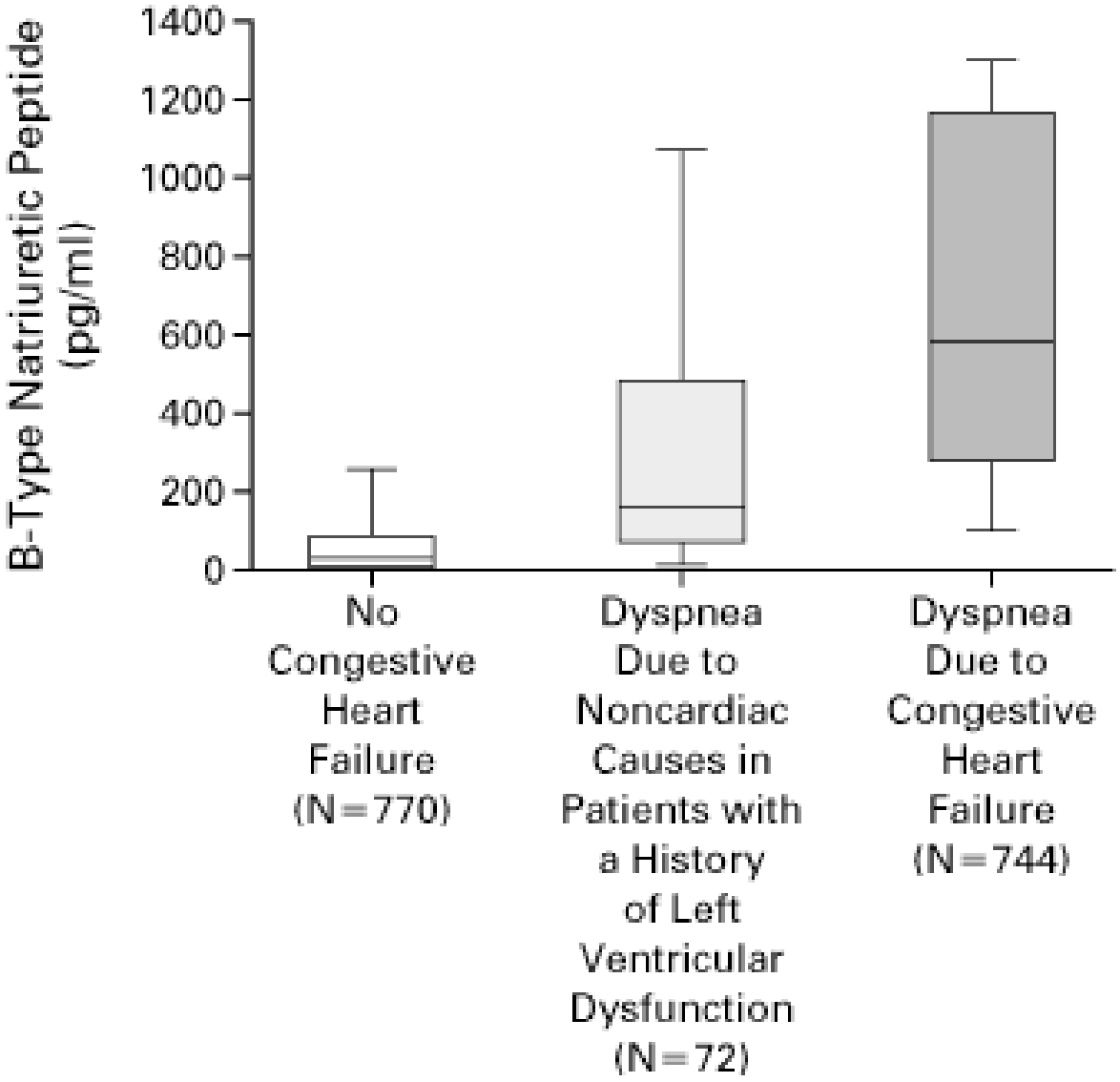

End Systole

*SK Ghandi, NEJM 2001, 344: 17-22*

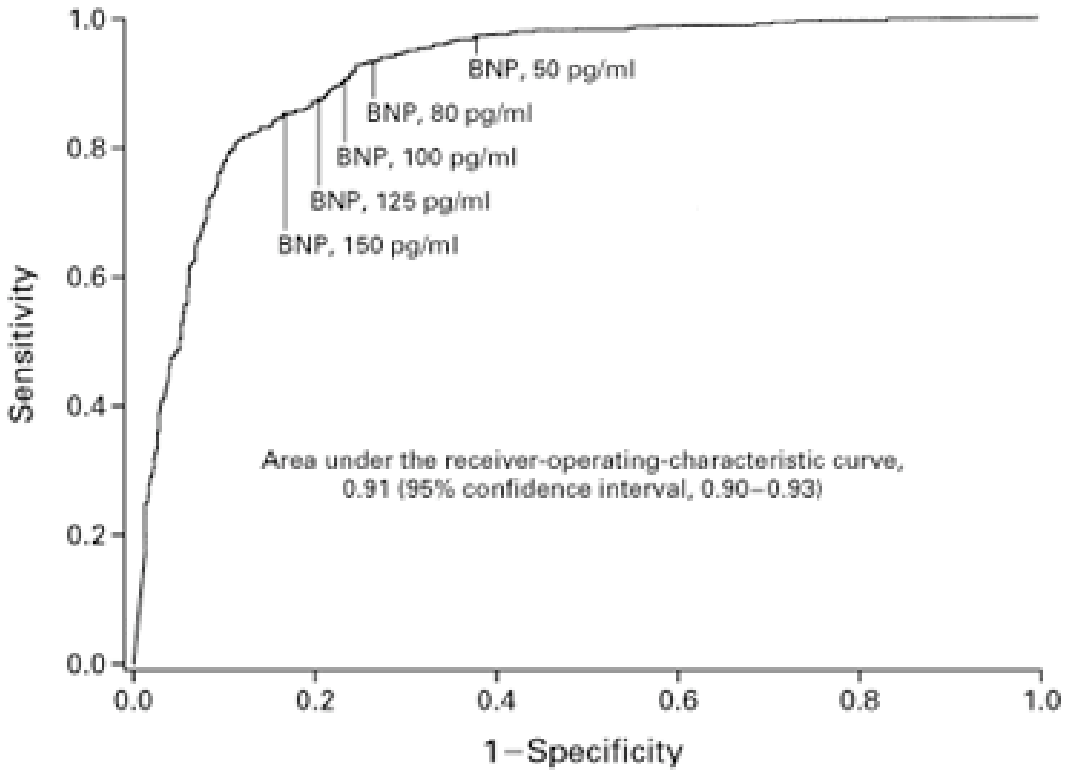
What is the role of BNP

in the diagnosis of

acute/decompensated HF?




*Maisel et al NEJM 2002, 347:161-167*




| BNP pg/ml | Sensitivity | Specificity | Positive Predictive Value | Negative Predictive Value | Accuracy |
|---|---|---|---|---|---|
| | (95 percent confidence interval) | | | | |
| 50 | 97 (96–98) | 62 (59–66) | 71 (68–74) | 96 (94–97) | 79 |
| 80 | 93 (91–95) | 74 (70–77) | 77 (75–80) | 92 (89–94) | 83 |
| 100 | 90 (88–92) | 76 (73–79) | 79 (76–81) | 89 (87–91) | 83 |
| 125 | 87 (85–90) | 79 (76–82) | 80 (78–83) | 87 (84–89) | 83 |
| 150 | 85 (82–88) | 83 (80–85) | 83 (80–85) | 85 (83–88) | 84 |

*Maisel et al NEJM 2002, 347:161-167*

# Conduite à tenir

- 1° geste : REMPLISSAGE pour élever la pression intramurale (le risque est l'augmentation de la congestion hépatique et rénale)
- clampage des drains en cas de plaie du coeur
- si urgence extrême et diagnostic certain : ponction sous échocardiographie au lit