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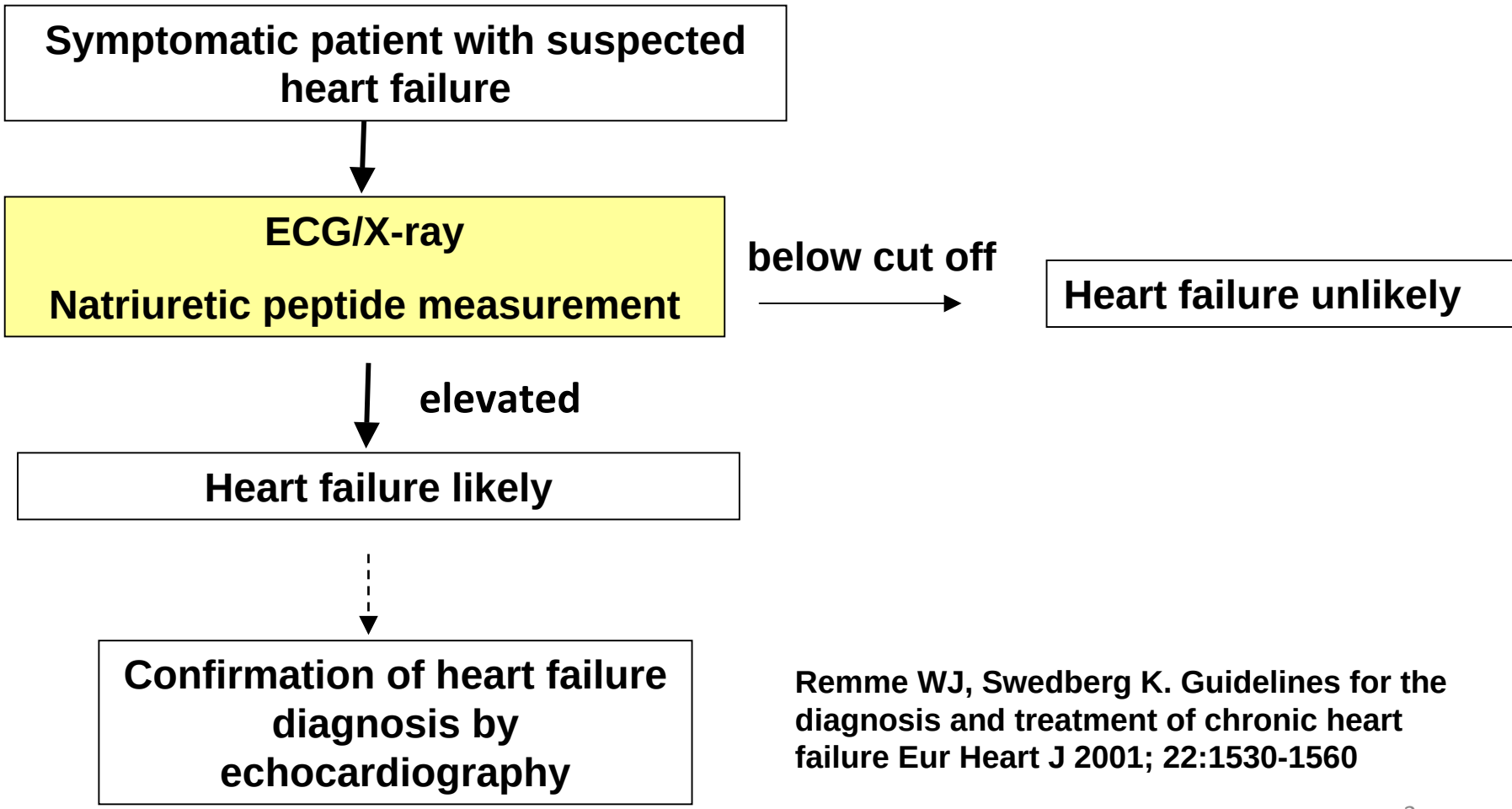
Clinical use of the cardiac biomarker N-terminal pro-B type natriuretic peptid (NT-proBNP)

NT-proBNP near patient testing improves the management of cardiac diseases.

NT-proBNP improves management of chronic heart failure in ambulatory patients and in patients submitted to hospital

- Early diagnosis of heart failure (1)
- Rule out of left ventricular dysfunction in symptomatic patients (2)
- Identification of asymptomatic patients at risk for the development of heart failure (3)
- Risk assessment and prognosis (4)
- Therapy and disease monitoring (5)

Natriuretic peptides in diagnosis and exclusion of chronic heart failure



Remme WJ, Swedberg K. Guidelines for the diagnosis and treatment of chronic heart failure Eur Heart J 2001; 22:1530-1560

NT-proBNP in the emergency department

- **Identification and exclusion of acute heart failure in patients presenting with acute dyspnoea in the emergency department (6)**

NT-proBNP measurement improves the identification and exclusion of acute dyspnoea through:

- **Rule in diagnosis with positive predictive values of 67-77%**
- **Exclusion with a high negativ predictive value of 99%**
- **Costs savings**
- **Improvement in selected outcomes**

Decision making based on NT-proBNP

Cut off values for exclusion of left ventricular dysfunction:

125 pg/ml: ambulatory patients with dyspnoea

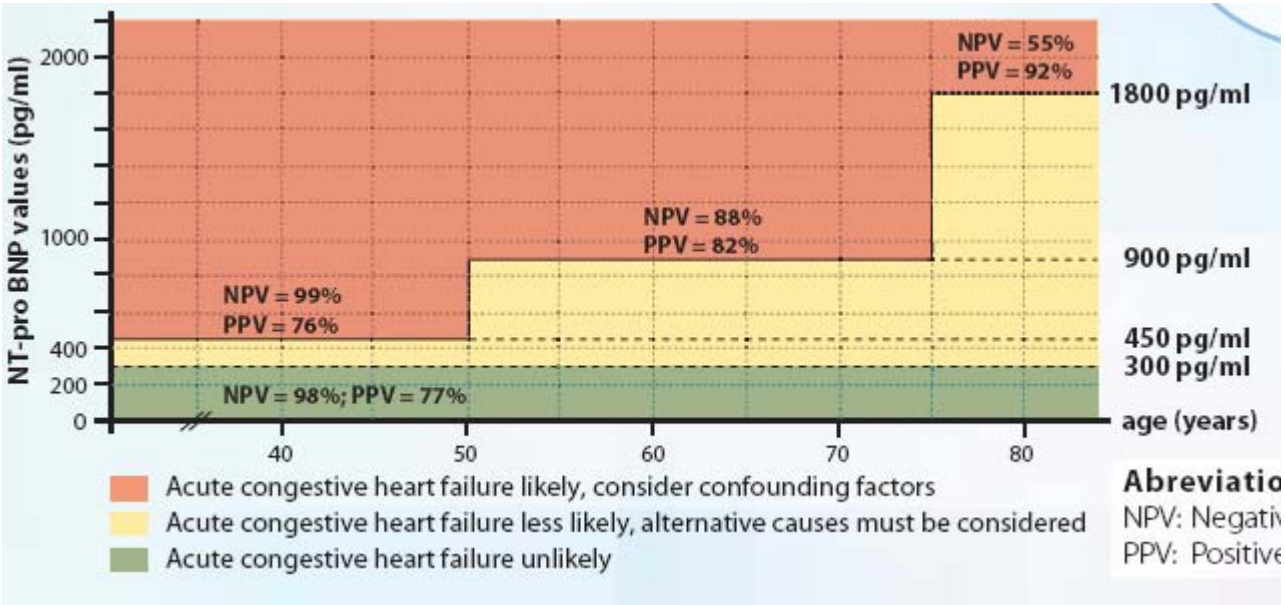
300 pg/ml: patients with **acute** dyspnoea presenting at the emergency room

Age dependent rule in cut off values for acute heart failure in case of acute dyspnoea:

< 50 years	> 450 pg/ml
50-75 years	> 900 pg/ml
> 75 years	> 1800 pg/ml

NT-proBNP in the diagnosis of acute heart failure in patients presenting at the emergency room with acute dyspoea

Age dependency of rule in cut off values



Intensive care unit

- **Therapy guidance (7)**
- **Management of acute heart failure (8)**

NT-proBNP provide independent prognostic information that improves risk stratification and guidance of treatment

ESC Guidelines
Laboratory test in patients hospitalized with acute heart failure

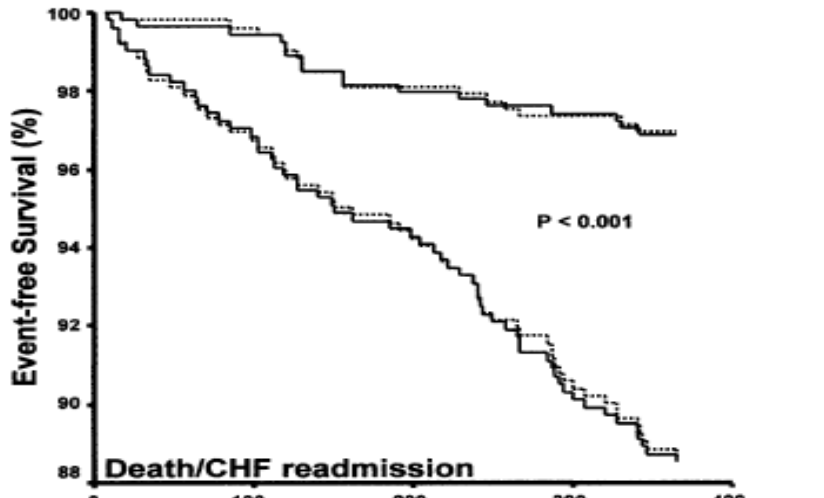
ESC Guidelines	
Blood count	**Available by PATHFAST**
Platelet count	
CRP	
D-dimer	**hsCRP**
CK-MB	**D-dimer**
TnI/T	**CK-MB**
BNP/NT-proBNP	**TnI**
Electrolytes	**NT-proBNP**
Blood glucose	

Adopted from the ESC Guidelines, Eur Heart J 2005; 26: 384-416

NT-proBNP for risk assesment and prognosis in patients with

- Hypertension, left ventricular hypertrophy (8)
- Congestive heart failure (9)
- Stable coronary artery disease (10)
- Unstable coronary artery disease (11
- Acute coronary syndromes (12)

12 month outcome of patients with stable ischemic heart disease dependent on baseline NT-proBNP/BNP values



						Events	%
BNP	< median	541	538	530	527	17	(3)
	≥ median	508	489	476	455	62	(12)
NTproBNP	< median	526	524	516	512	16	(3)
	≥ median	523	503	490	470	63	(12)

Figure 7. Kaplan-Meier event-free survival curves for death or heart failure admission for those with brain natriuretic peptide (BNP) **(solid lines)** and amino terminal pro-brain natriuretic peptide (NTproBNP) **(dotted lines)** above **(lower two lines)** or below **(upper two lines)** the median level for the group. For both peptides, the separation of survival curves was highly significant ($p < 0.001$). CHF = congestive heart failure.

Richards M et al. J Am Coll Cardiol 2006; 47: 52-60

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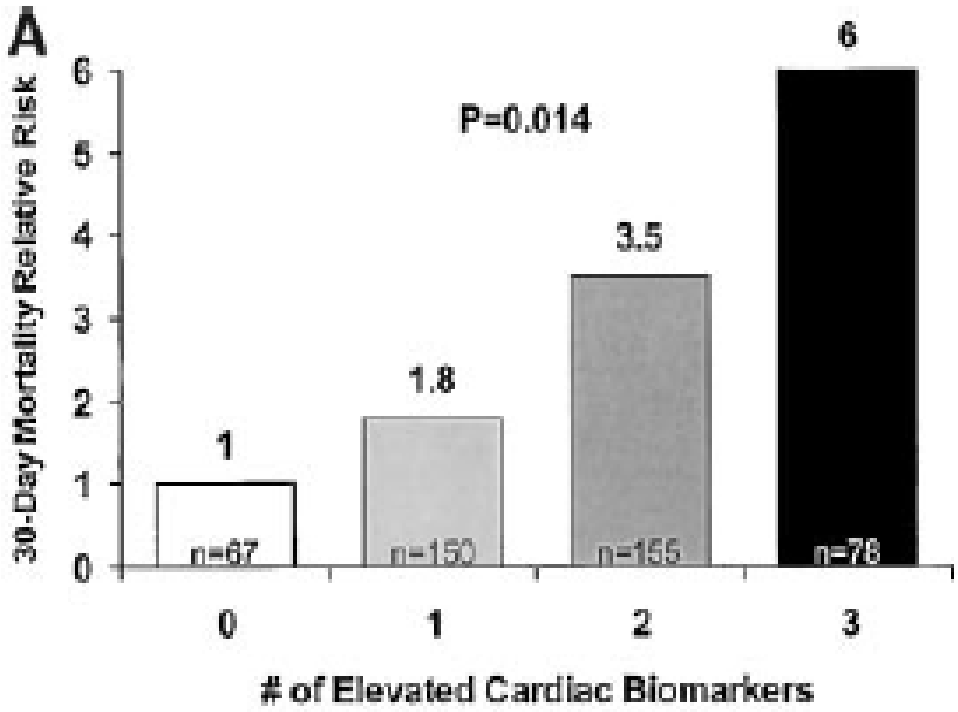
The PASTFAST system alllows simultanous testing of cardivascular biomakers for improved risk assessment and prognosis

Troponin I, hsCRP and NT-proBNP each provide prognostic informartion in patients with ischemic heart disease.

A multimarker approach that catogerizes patients on the number of elevated biomarkers at base line allows risk stratification regarding short- and long-term major cardiac events

Multimarker risk stratification with Troponin I & hsCRP and BNP



Relative 30-day mortality risk in patients stratified by the number of elevated biomakers (Troponin I, hsCRP, BNP) in TACTICS-TIMI-18 trial
(adopted from Sabatine et al. Circulation 2002; 105: 1760-63)