

**Dept. of Cardiology,
University of Uppsala, Sweden**



**Biomarker strategy in ACS –
troponin solely or multimarker
approach?**

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The clinical problem

Diagnosis

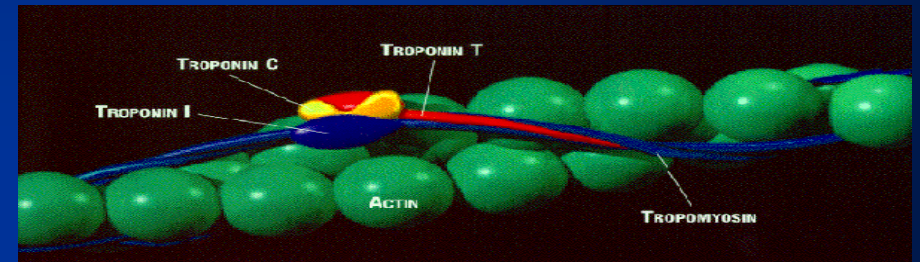
For patients presenting with chest pain there is a broad spectrum of diagnosis, including chest pain of non cardiac causes, unstable angina and MI

Prognosis and treatment

In patients with ACS there is diverse prognoses and appropriate treatments

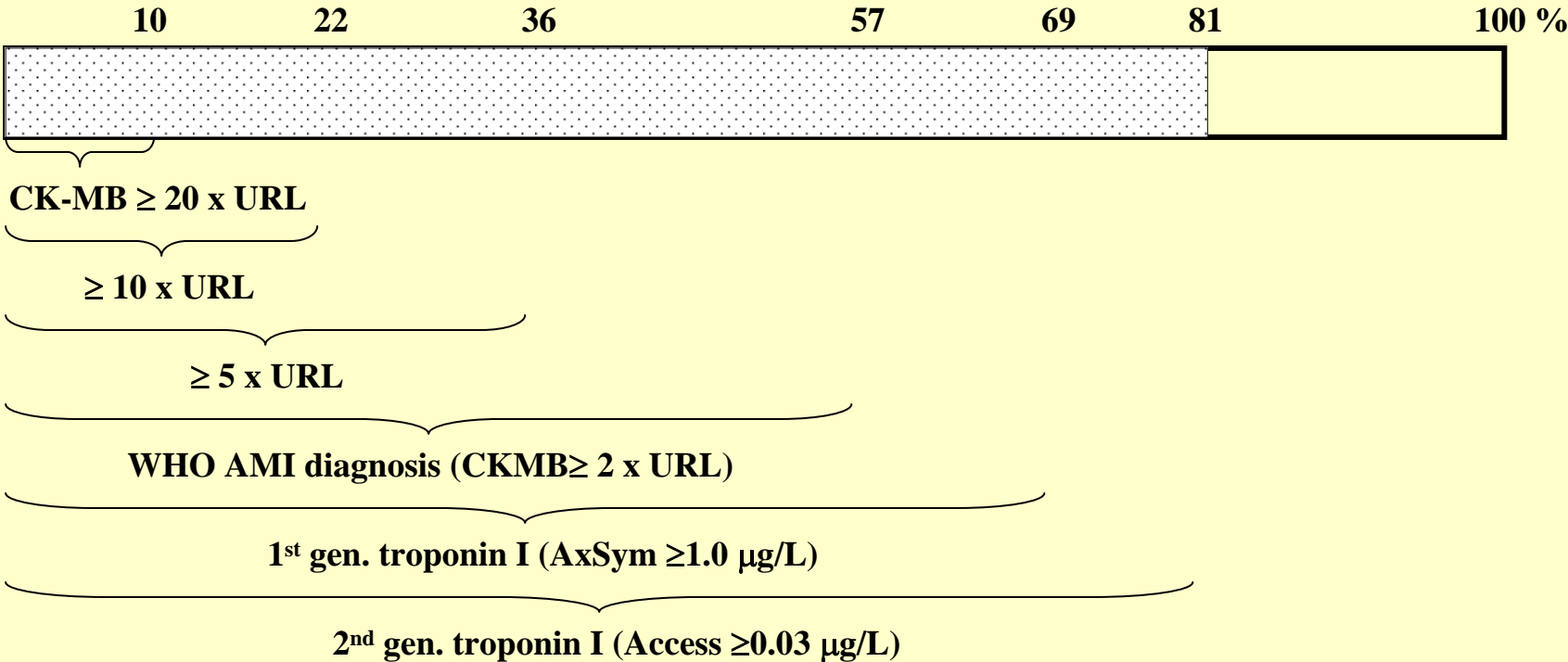
Markers Reliable for Diagnosis?

Troponin I or T

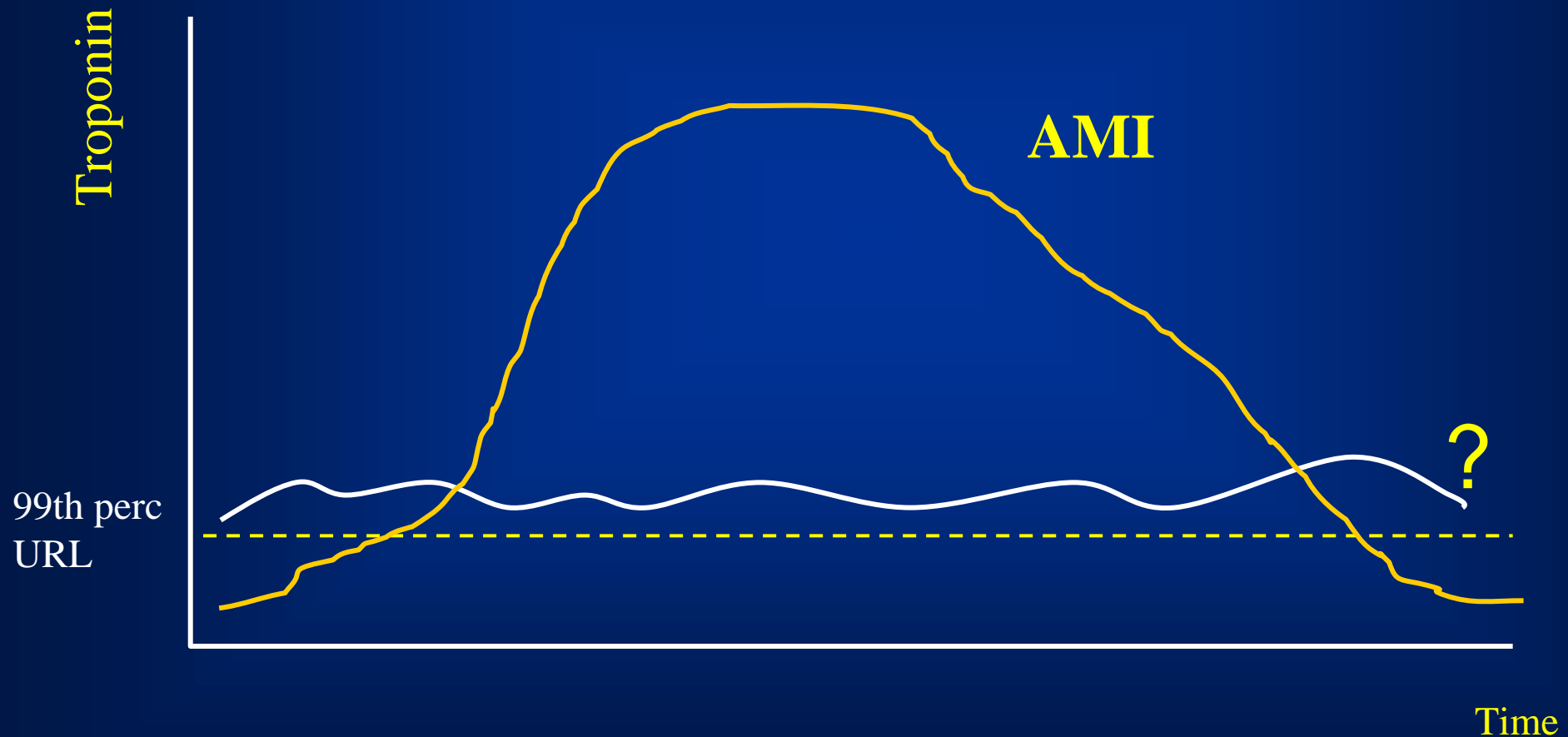


- high sensitivity and specificity – reliable detection of very small myocardial damage
- wide time window – detection of damage of different age

Non-STelevation ACS



Acute coronary syndrome - The diagnostic dilemma



Biochemical markers in ACS - Reliable for prognosis?

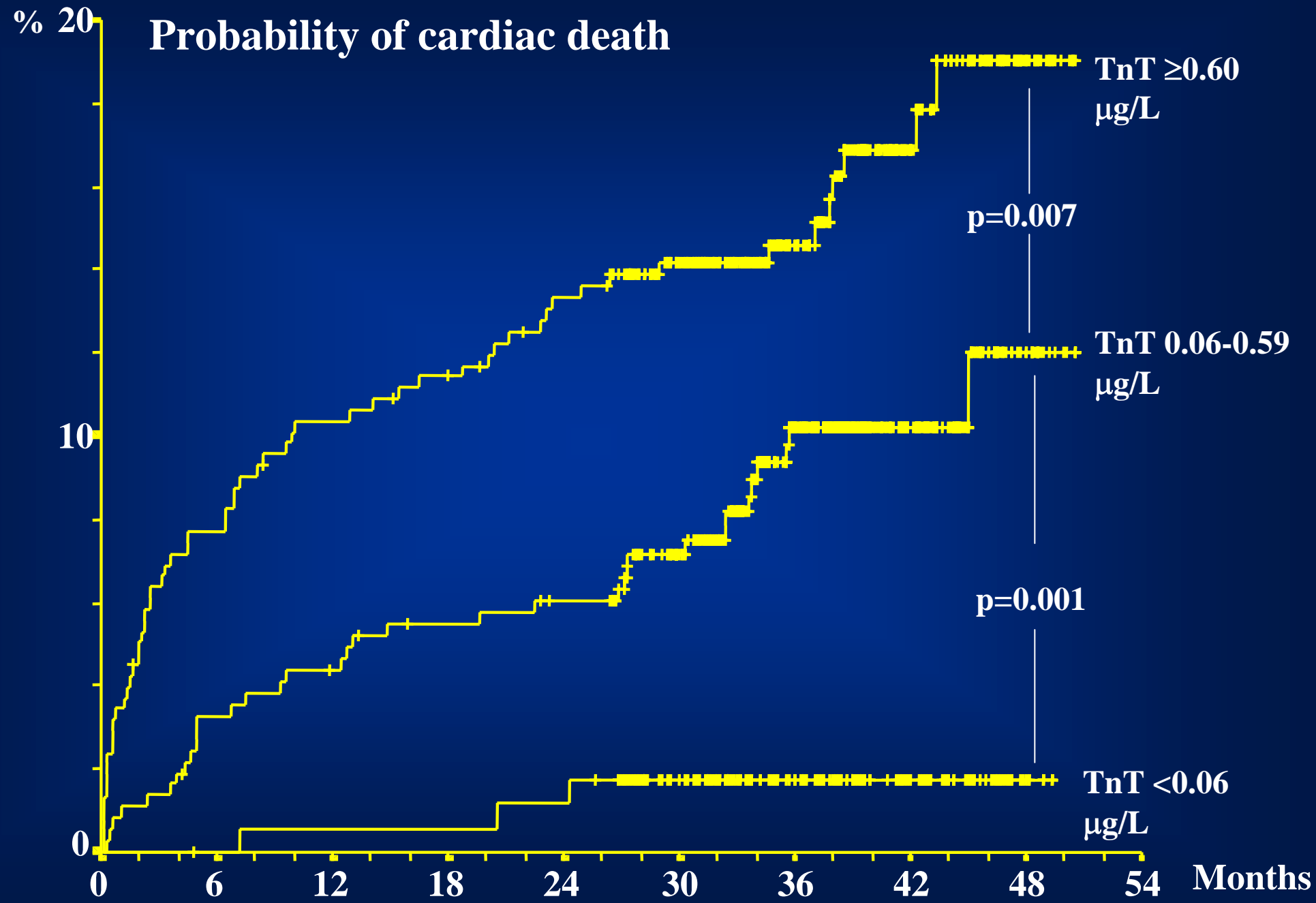


Predictive of death

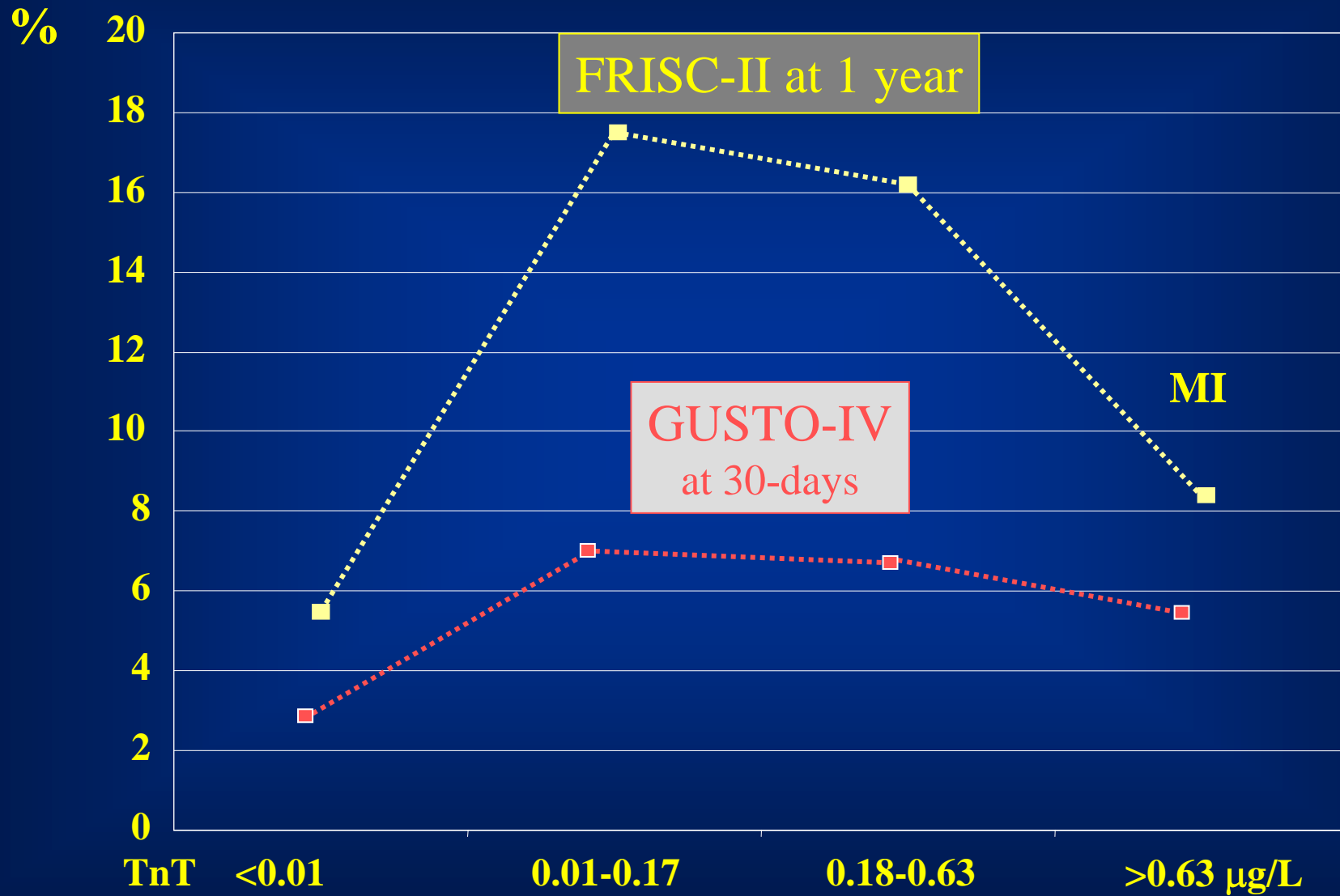
- Troponin
- BNP/NT-proBNP
- Markers of renal function
(creatinine, calc.creatine
clearance, Cystatin C)
- Markers of inflammation
(CRP, IL-6, IL-10, PIGF)

Predictive of MI

- Troponin
- CD40L
- oxLDL



Risk of MI



**Death at 1 year,
Odds ratio (95% CI)**

**AMI at 30 days,
Odds ratio (95% CI)**

Age > 65 years

Current smoking

Angina Pectoris

Previous MI

Heart failure

Diabetes mellitus

ST-depression > 0.5 mm

Heart rate > 68 /min

Crea. cl. ≤ 51 ml/min

CRP > 10 mg/L

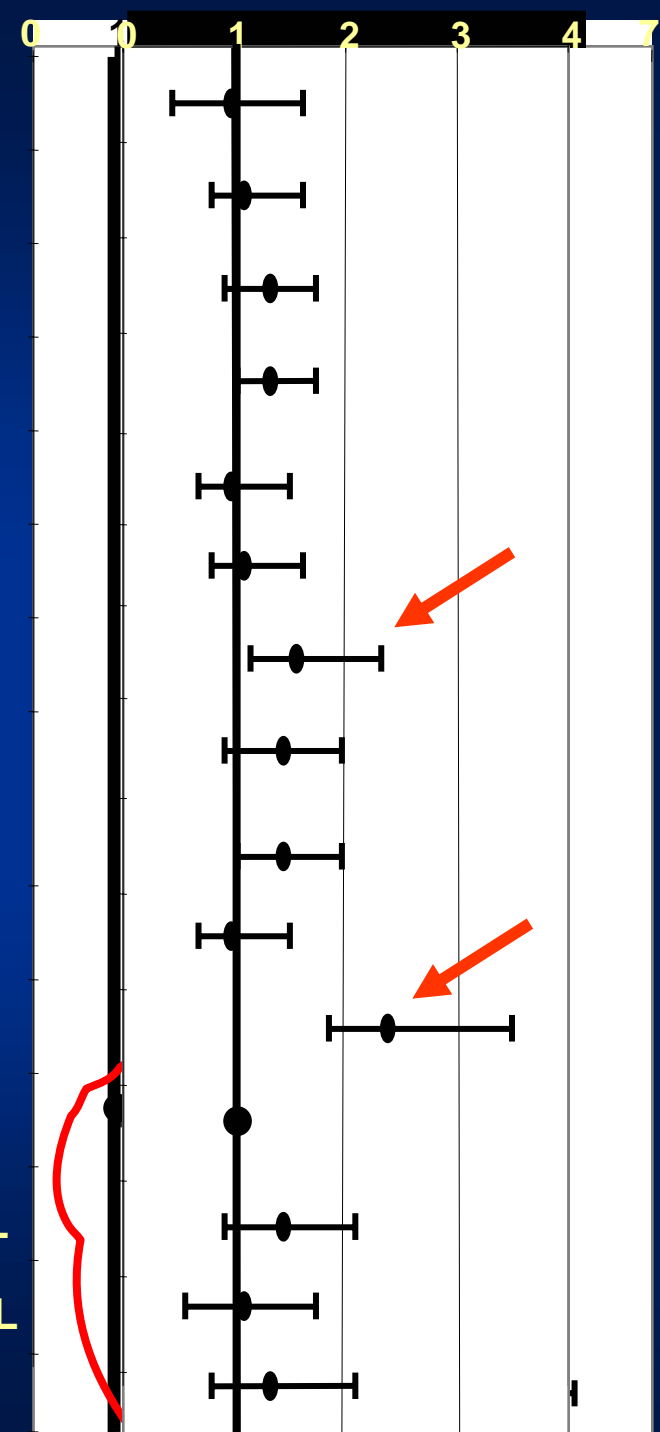
Troponin T > 0.01 ug/L

NT-proBNP ≤ 237 ng/L

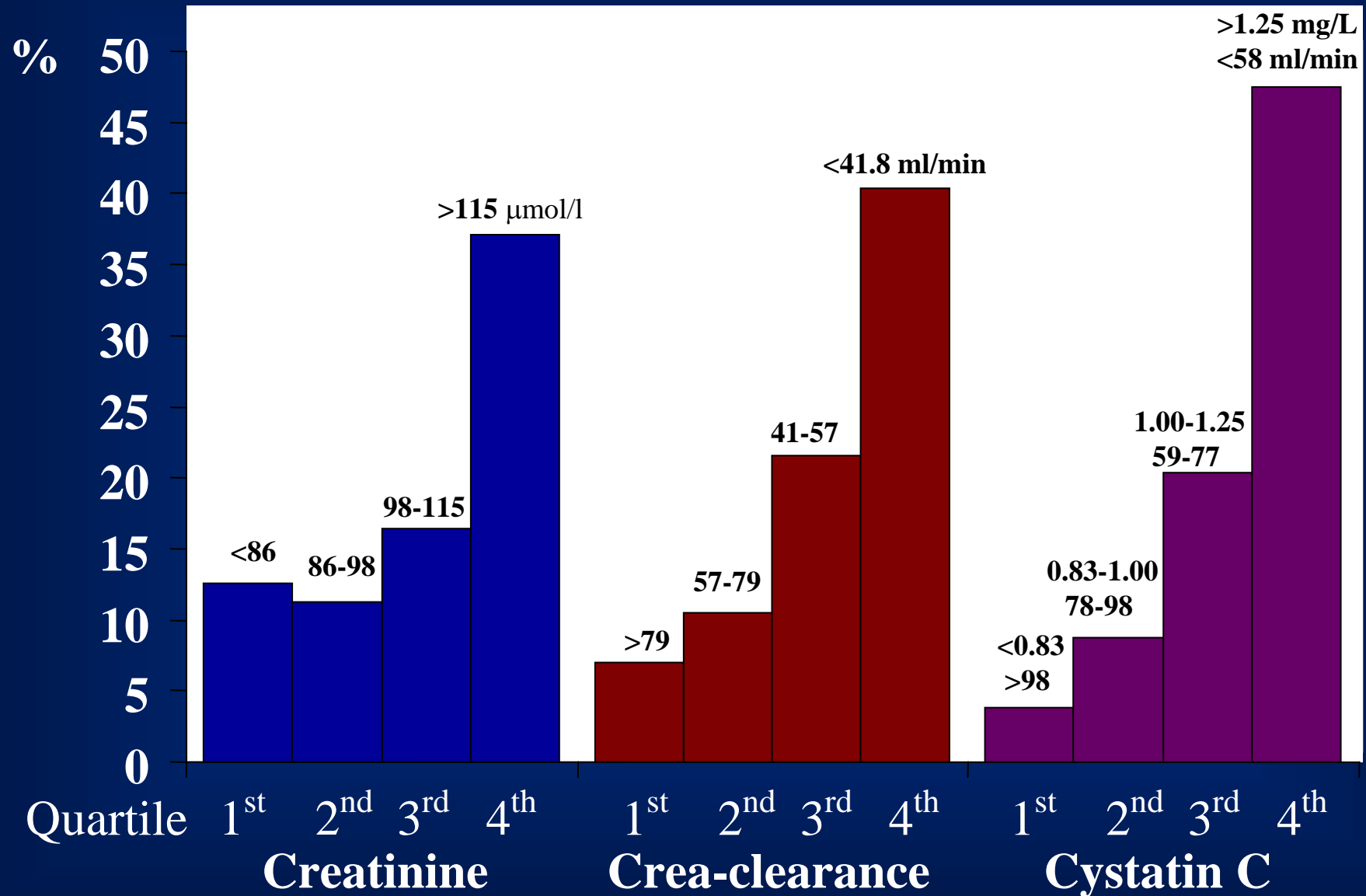
NT-proBNP 238- 668 ng/L

NT-proBNP 669-1869 ng/L

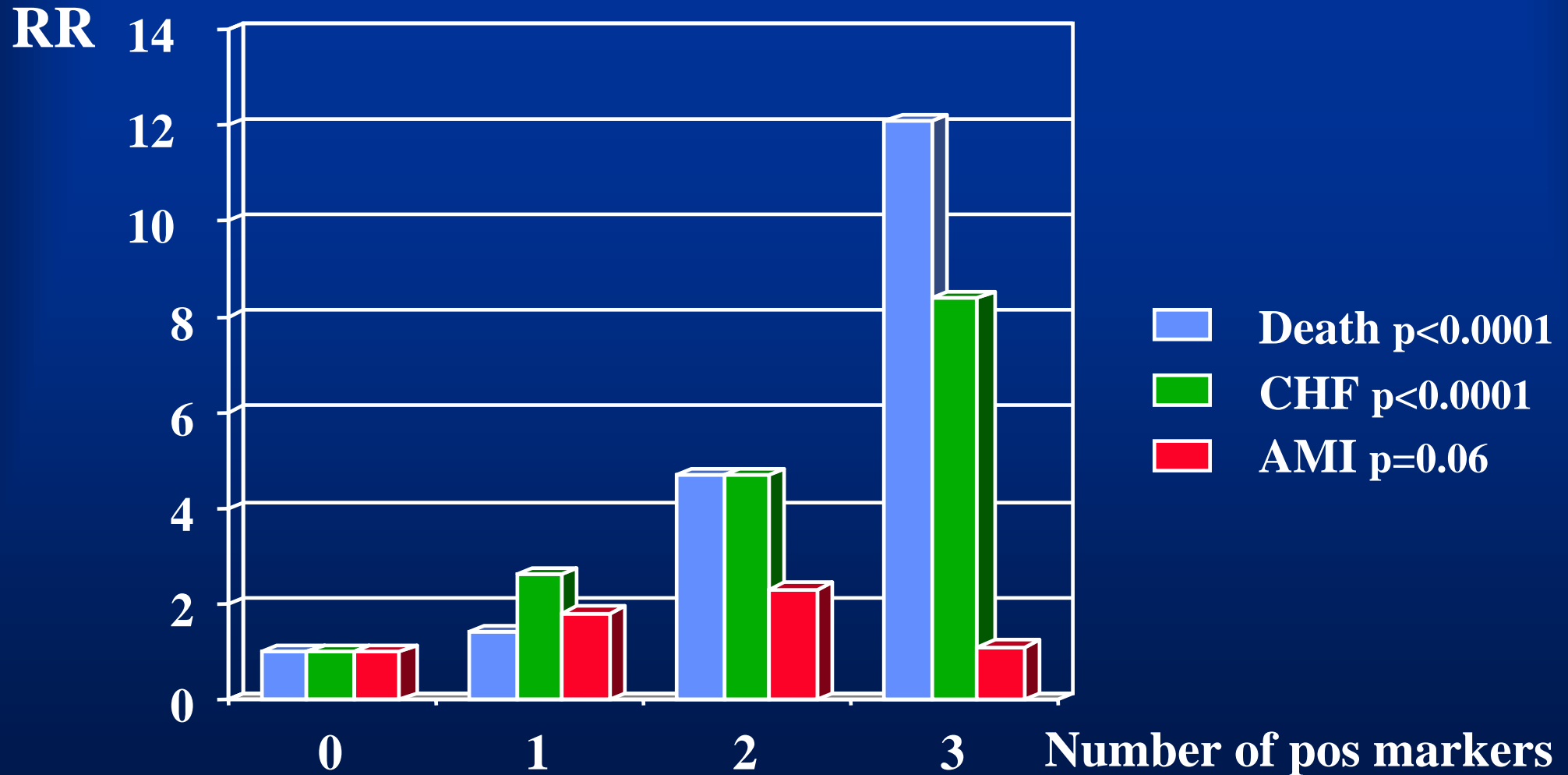
NT-proBNP > 1869 ng/L



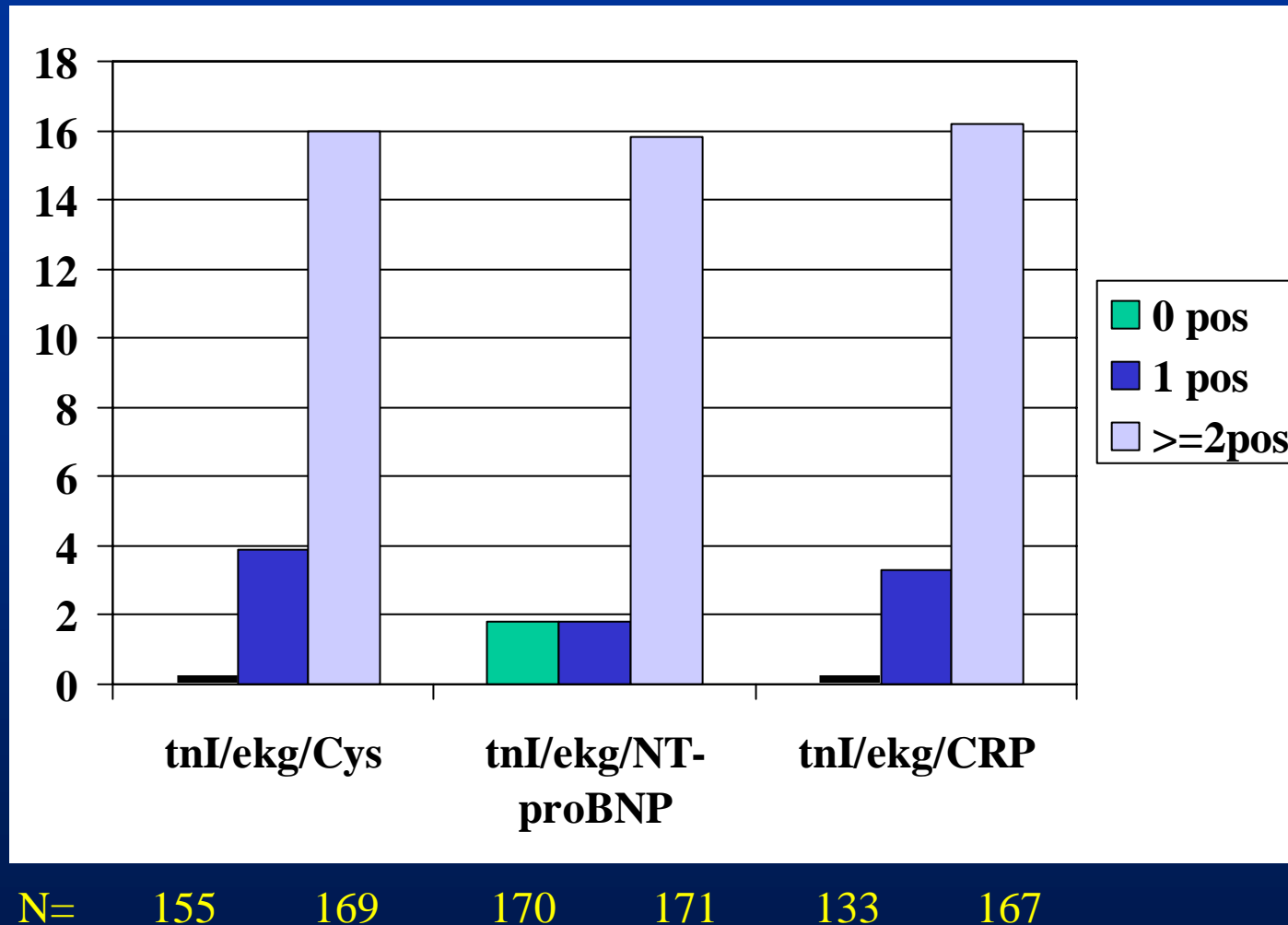
Mortality after 35 months



TnI, CRP & BNP in nonST-elev ACS (6 month-event rate in TACTICS)

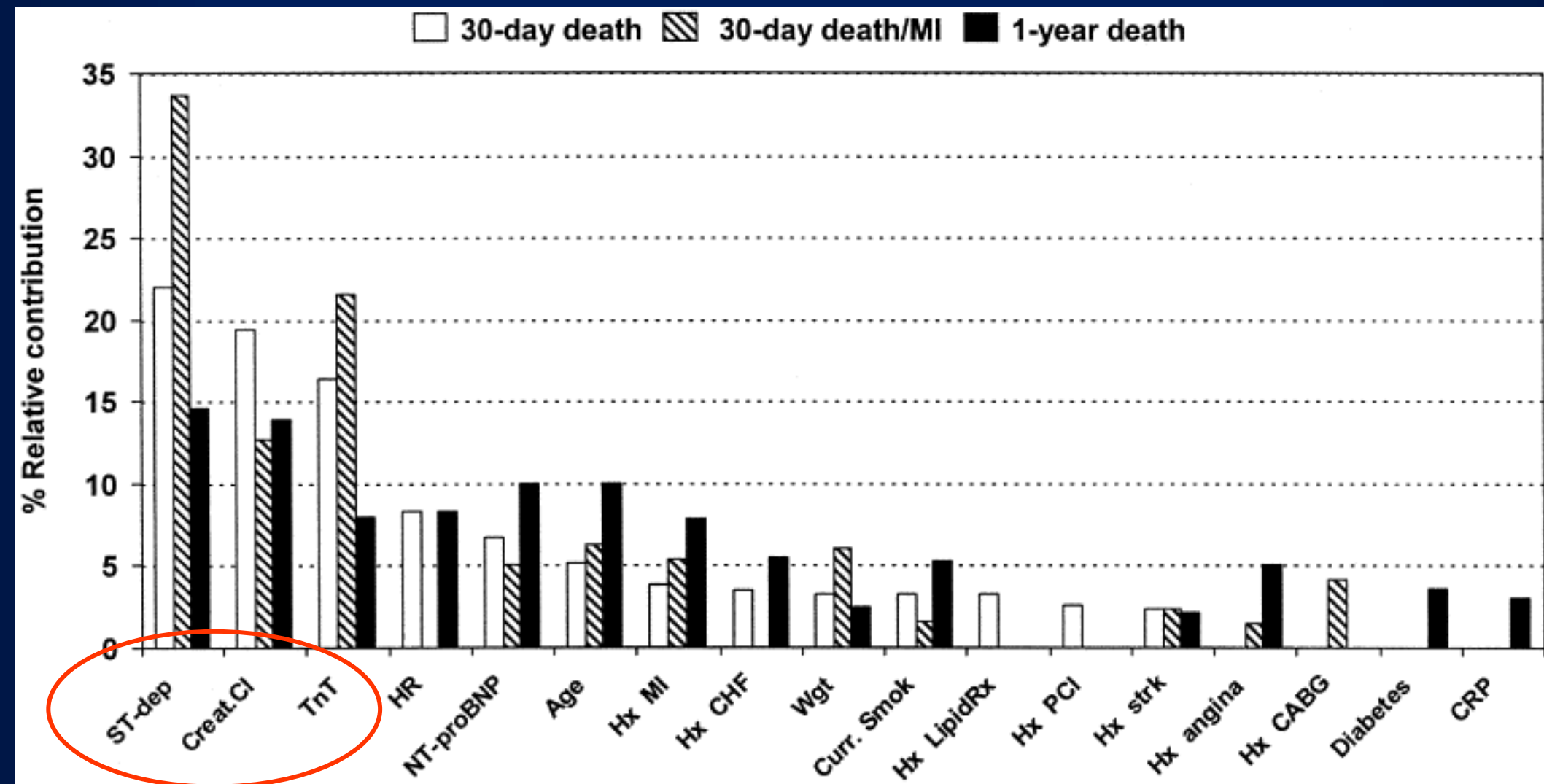


% death/AMI at 6 months (FAST-2/FASTER)



tnI (0,1) within 2 h; ECG, NT-proBNP (≈ 550), Cystatin C ($\approx 1,2/60$) & CRP (≈ 4) at admission

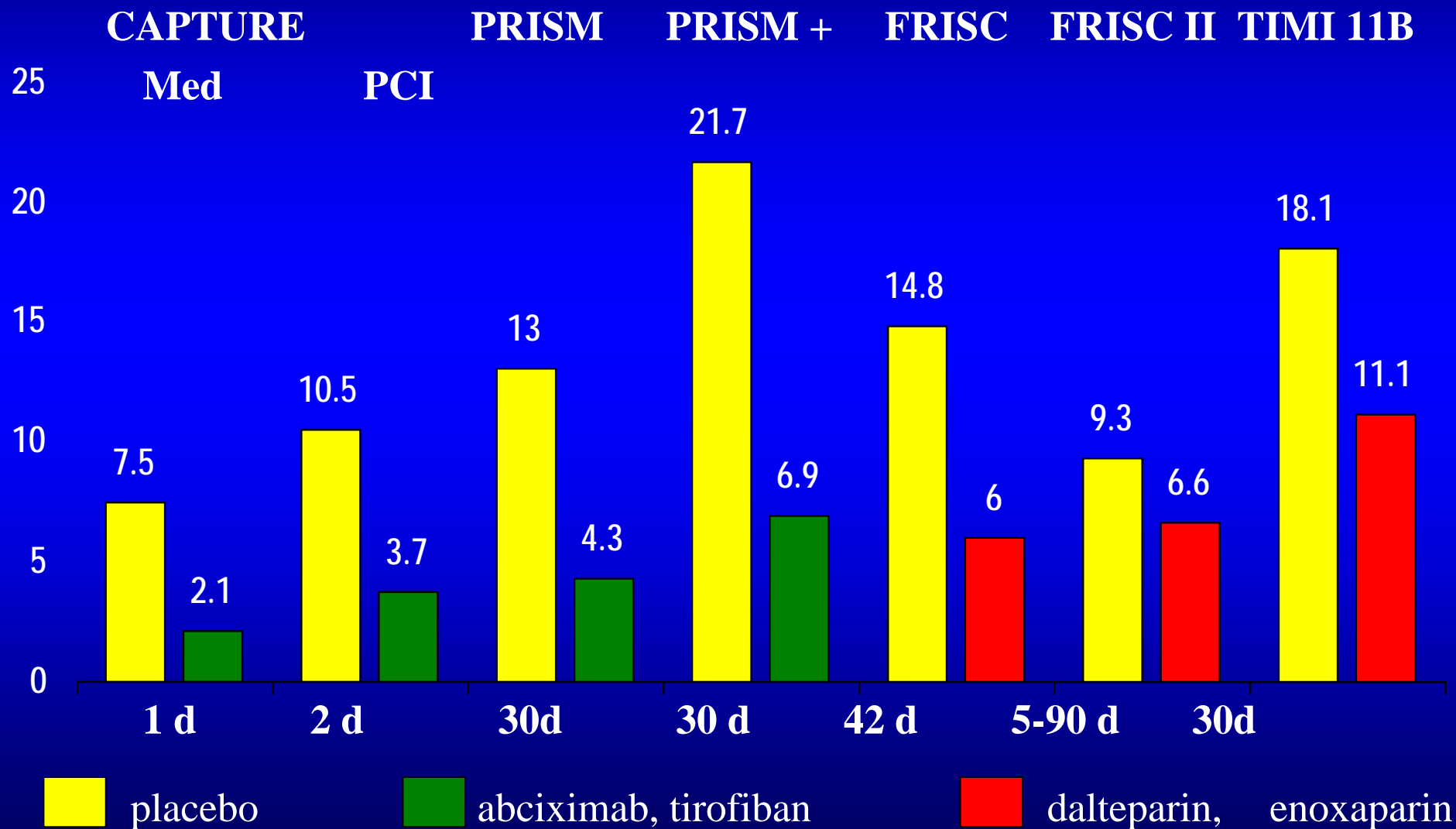
Relative contribution to prediction of events in GUSTO-IV

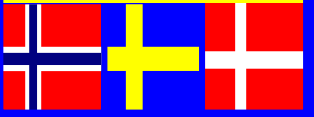


Biochemical markers in ACS - reliable for selection of therapy?

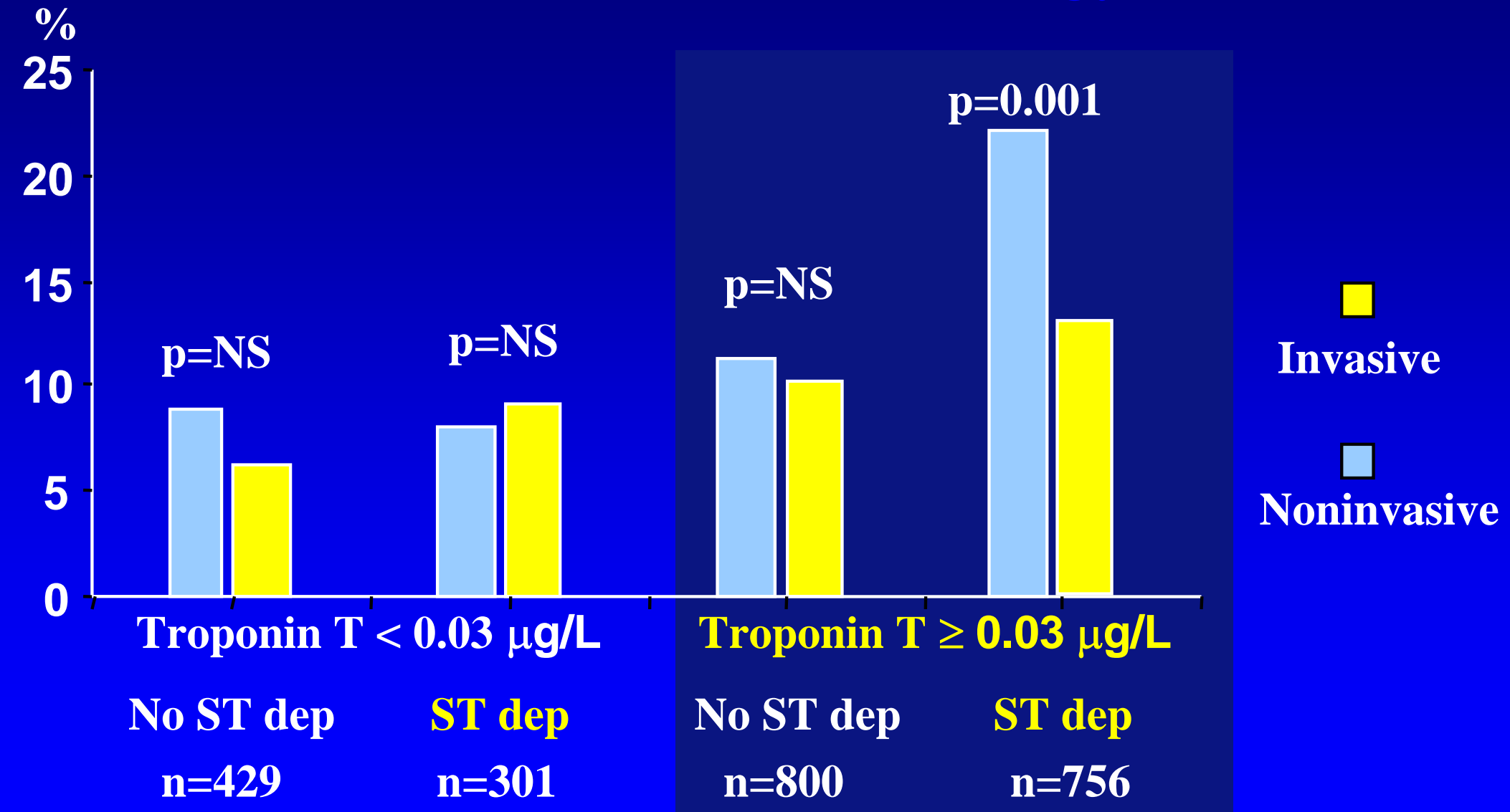
- Anti-thrombotic therapy – troponin (CD40L)
- Anti-platelet therapy – troponin (CD40L)
- Invasive therapy

Troponin T/I positive (Death /MI)

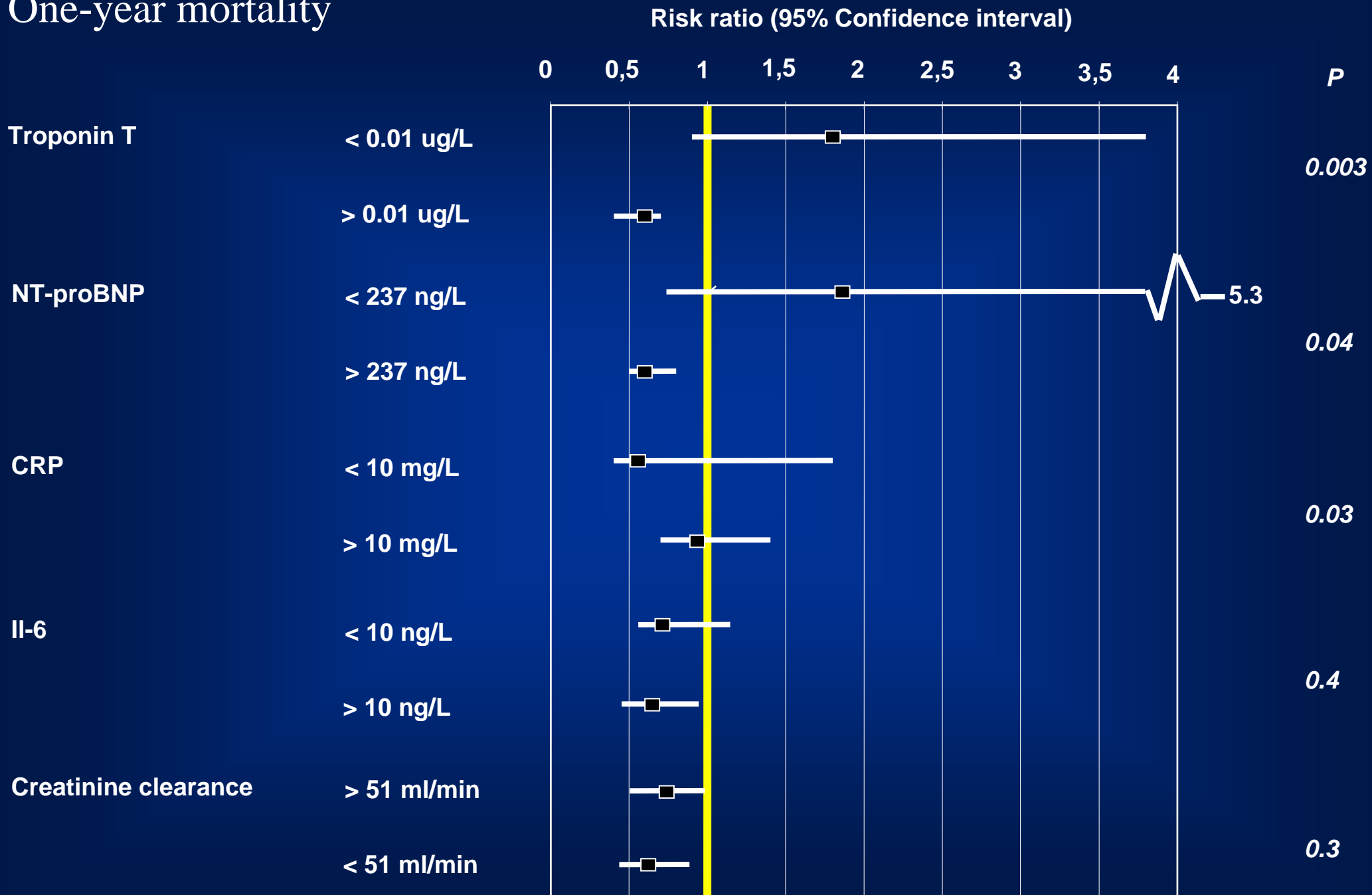




ST-dep and Troponin and effect of invasive strategy



One-year mortality



Conclusions

- The patient history, ECG and troponin T/I constitute the basis for diagnosis and early risk stratification and have been shown to be useful for selection of treatment
- Measurements of renal function (Cystatin C or Crea.clear.) add clinically relevant prognostic information and is necessary on every patients for other reasons
- It is doubtful that a 4th marker (eg. BNP/NT-proBNP or any other current marker) will add *clinically* meaningful incremental prognostic information