بسم الله الرحمن الرحيم

RISK STRATIFICATION IN PATINETS WITH NSTE -ACS.

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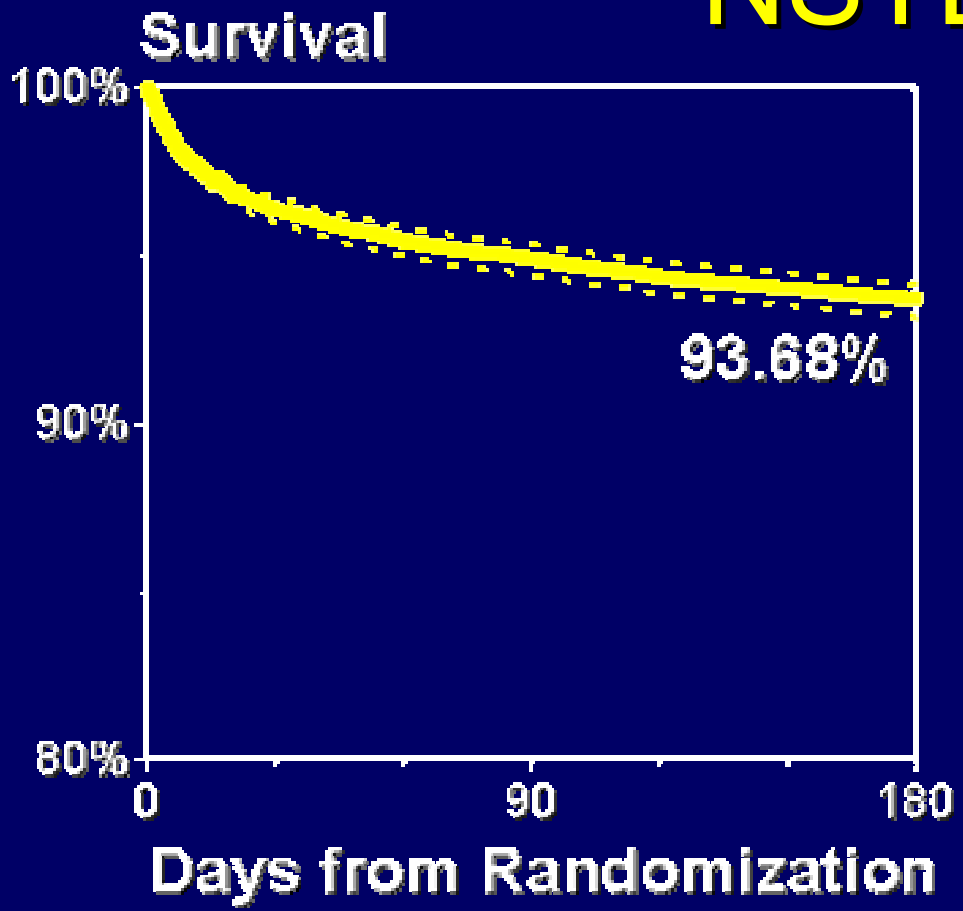
1. *NATURAL HISTORY*:

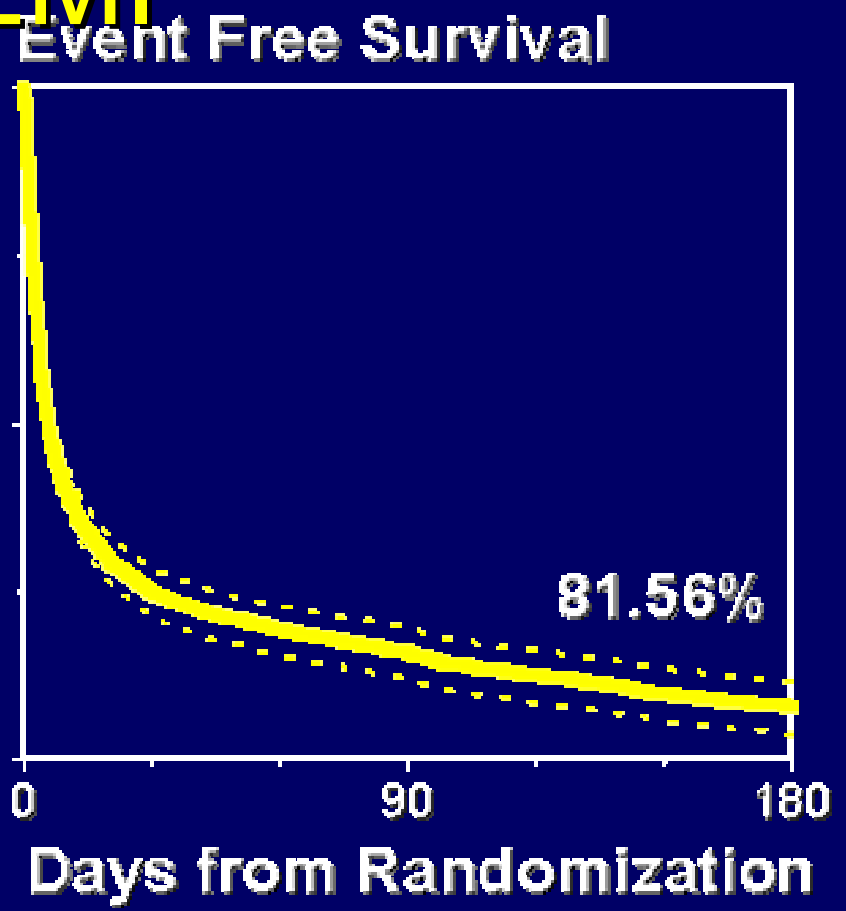
-The short-term mortality of patients with unstable angina has been shown to be lower(1.7% at 30 days) than that of patients with NSTEMI or STEMI.

-long term outcomes-for both mortality &nonfatal events- are actually worse for patients with either unstable angina or NSTEMI compared with STEMI.

- ***SHORT TERM OUTCOME*** *is depenent on* the hemodynamic state
- ***MEDIUM TERM OUTCOME*** ; transient ST segment shift
- ***LONG TERM OUTCOME*** Tn T&I longer term above and beyond conventional risk factors

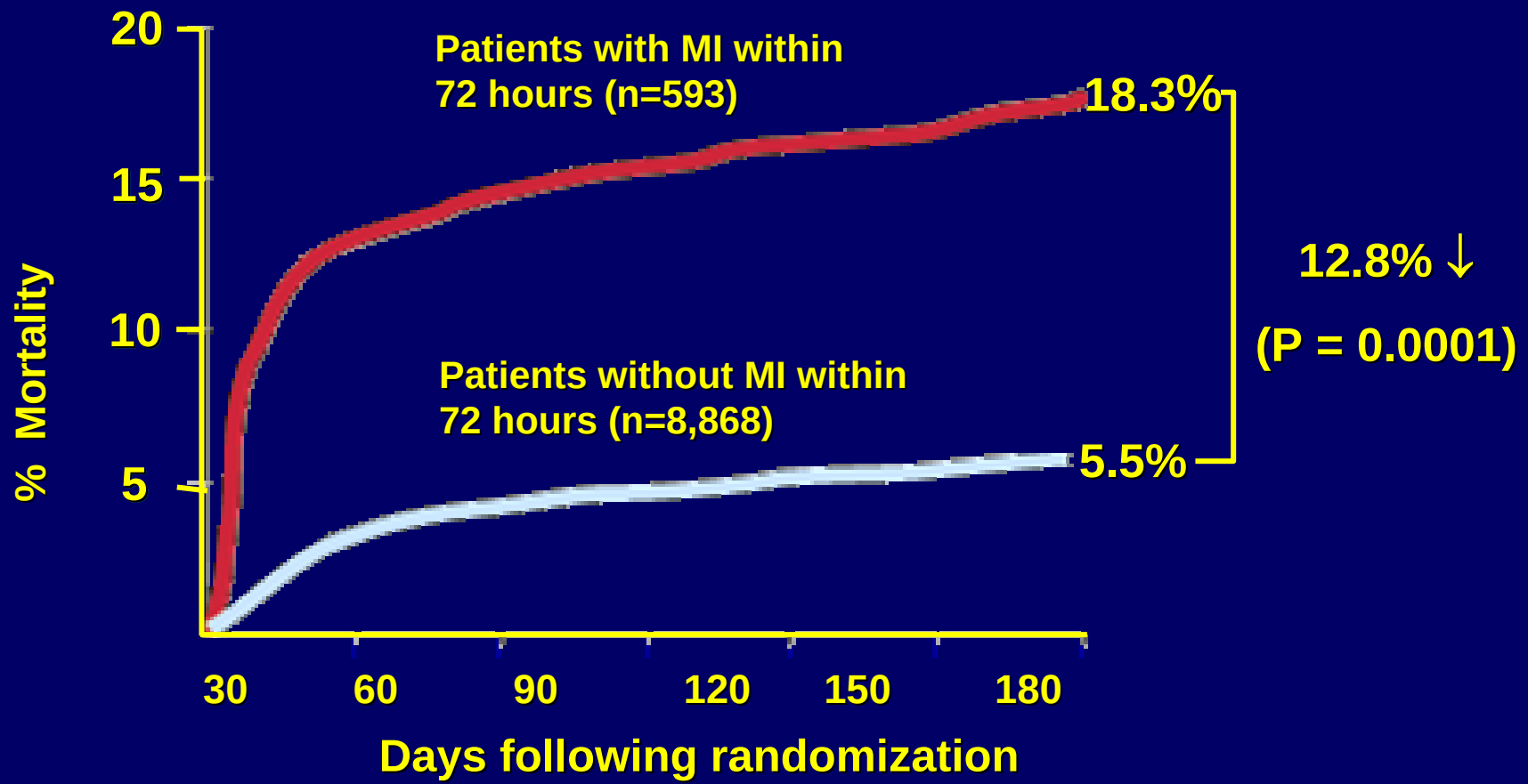
Prognosis in Unstable Angina / NSTEMI





PURSUIT trial data

Mortality in Non-ST ↑ ACS Patients With Myocardial Infarction During Hospitalization



Fintel D, ACC, 2000

2-METHODS OF RISK STATIFICATIN.

patients with UA/NSTEMI are a heterogeneous group, with a prognosis that ranges from

- ***An excellent outcome*** with modest adjustments in therapeutic regimen,
- ***high risk*** of death or MI : in which intensive treatment is needed.

- High risk ***subgoups of patients, identified by***:
  -clinical features.
  -electrocardiographic findings, or
  -cardiac(or vascular) markers.

- This ***group appear to*** derive greater benefit from more aggressive -antithrombotic or
  - interventional therapy or
  - both.

3-CLINICAL VARIABLES:

-classification of unstable angina has been shown in several studies to be useful clinically in identifying high risk patients.

-High risk groups of patients with unstable angina are those with :

-Acute rest pain.

-Post-MI unstable angina.

-Secondary unstable angina.

4-RISK ASSESSMENT BY ECG :

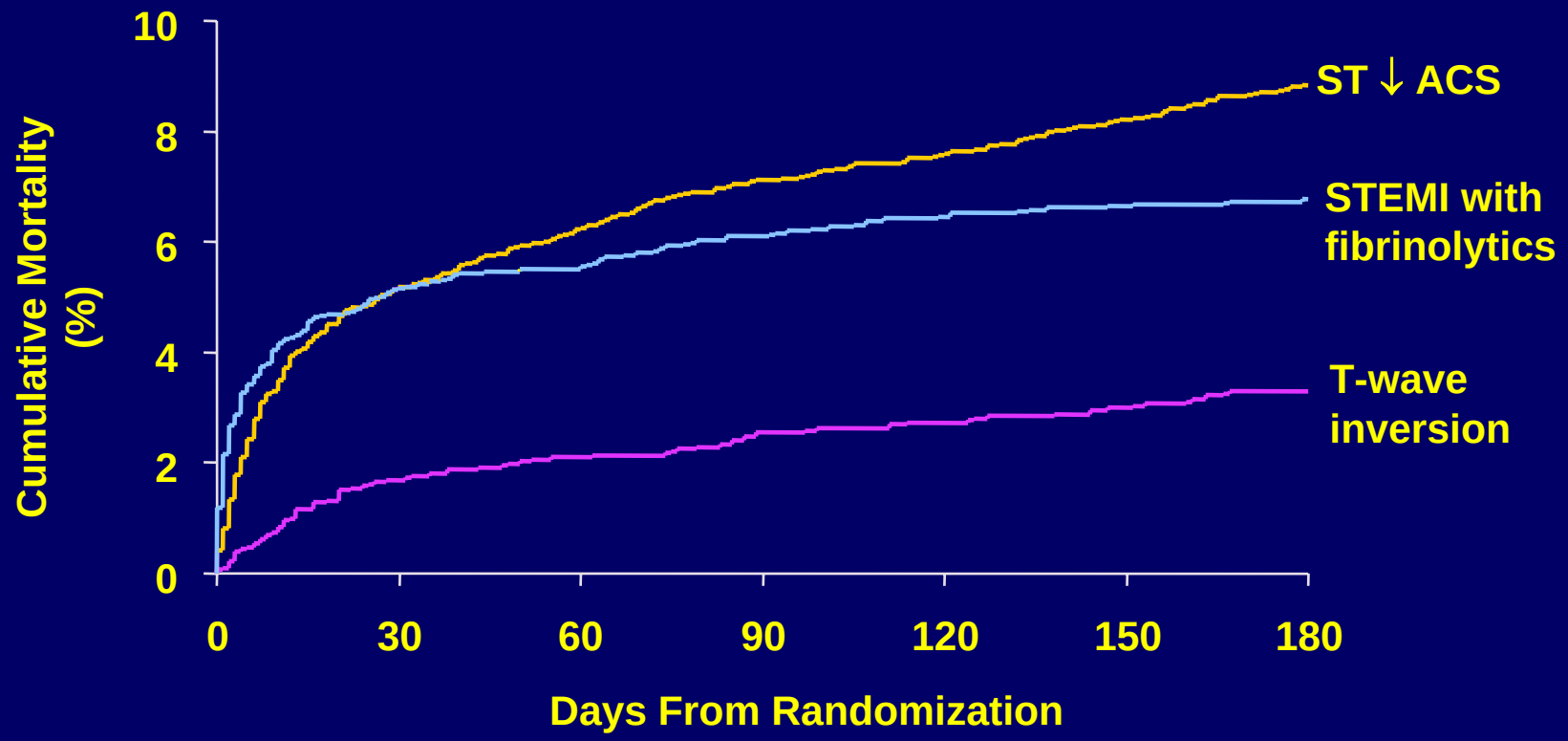
-The admission ECG is very useful in predicting long-term adverse outcomes.

-Independent predictors of 1-year death or MI included: - LBBB

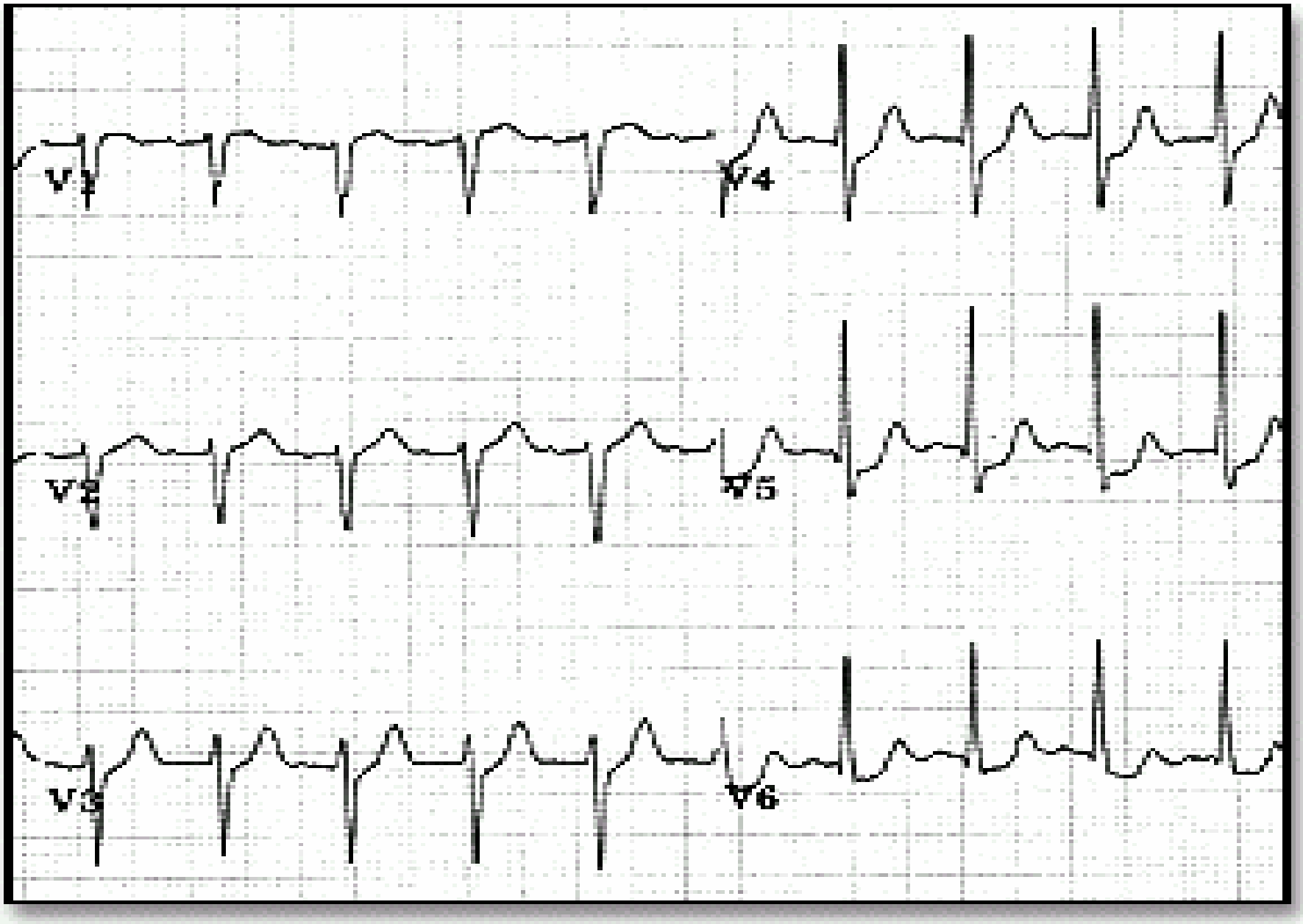
-ST segment deviation > 0.05mv.

-The presence of T wave changes > 0.1mV, was associated with a modest or no increase in subsequent death or MI.

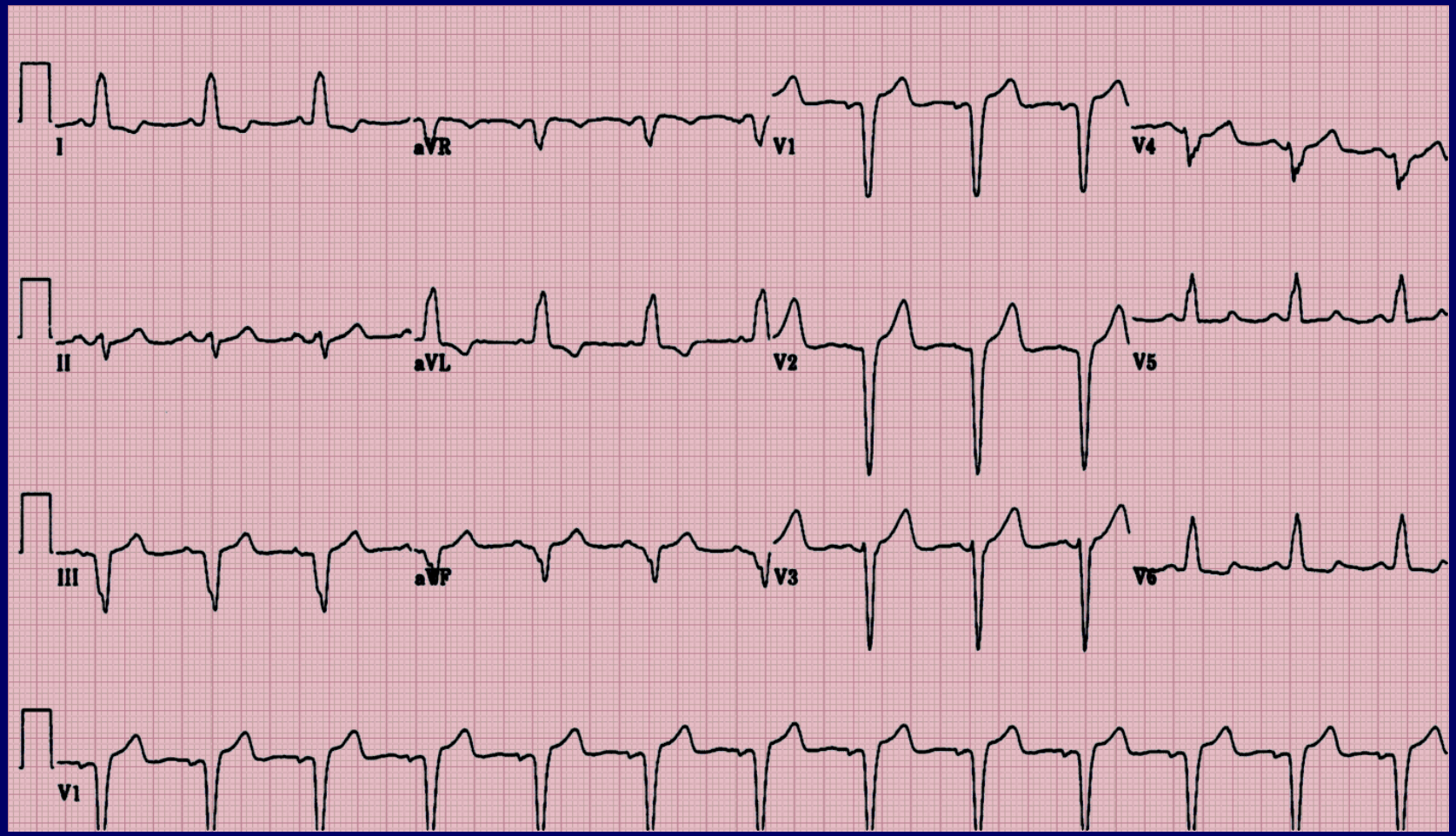
GUSTO IIb: Correlation of 6-Month Mortality With Baseline ECG Findings in Patients With ACS



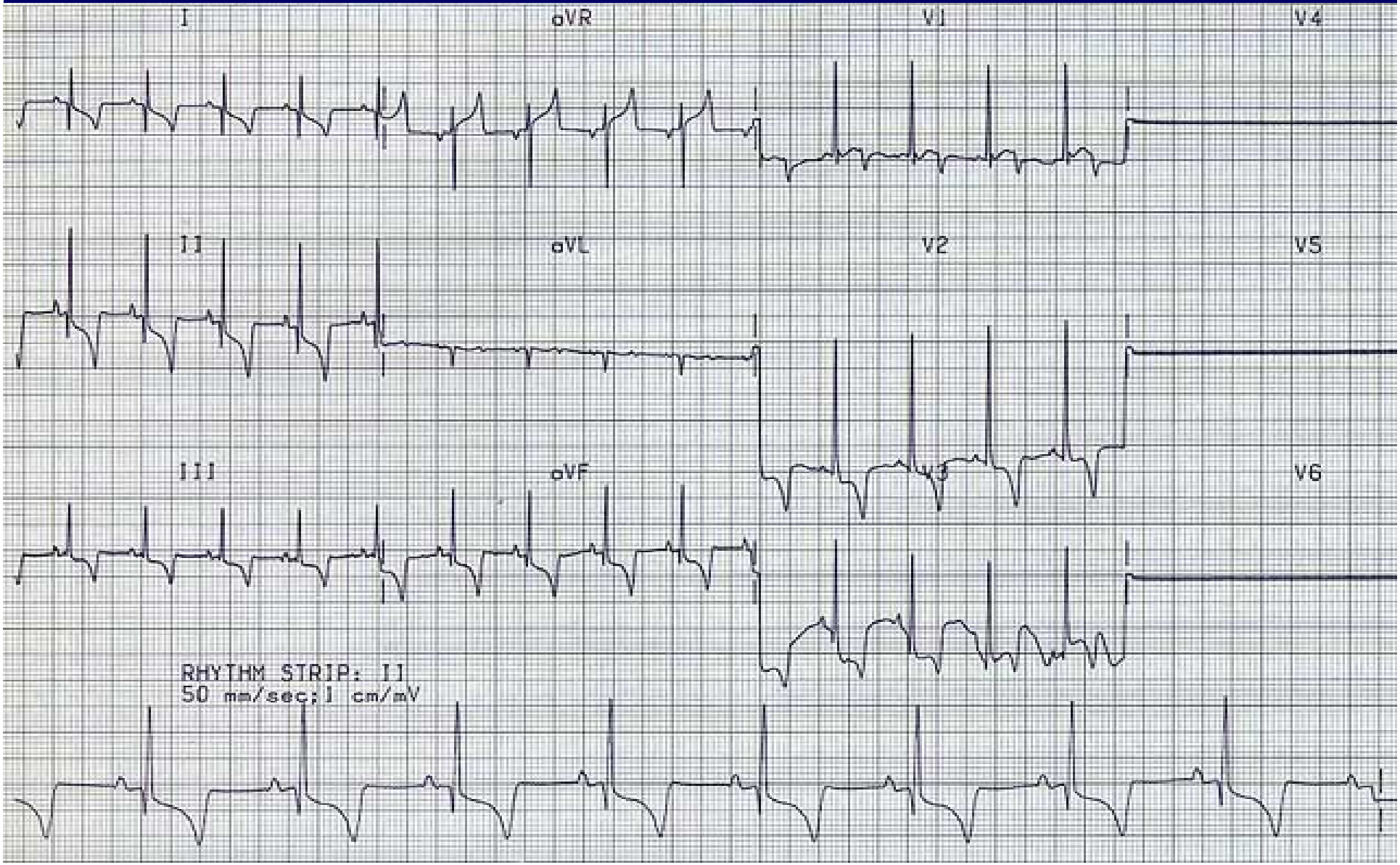
Typical ST Depression



New LBBB



Non-ST-Segment Elevation MI



5-RISK ASSESSMENT BY CARDIAC MARKERS.

1-Creatine kinase-MB

NSTMI= elevated biomarkers of myocardial necrosis

-NSTMI with elevated CK-MB or troponins, have a worse long-term prognosis than those with unstable angina.

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CK/MB

- Rises 4-6 hours after injury and peaks at 24 hours
- Remains elevated 36-48 hours
- Positive if CK/MB > 5% of total CK and 2 times normal
- Elevation can be predictive of mortality
- False positives with exercise, trauma, muscle dz, DM, PE

2-Myoglobin

- Rises 2-4 hours after injury and peaks at 6-12 hours
- Remains elevated 24-36 hours
- Not cardiac specific
- Rise of 25-40% over 2 hours strongly predictive of MI

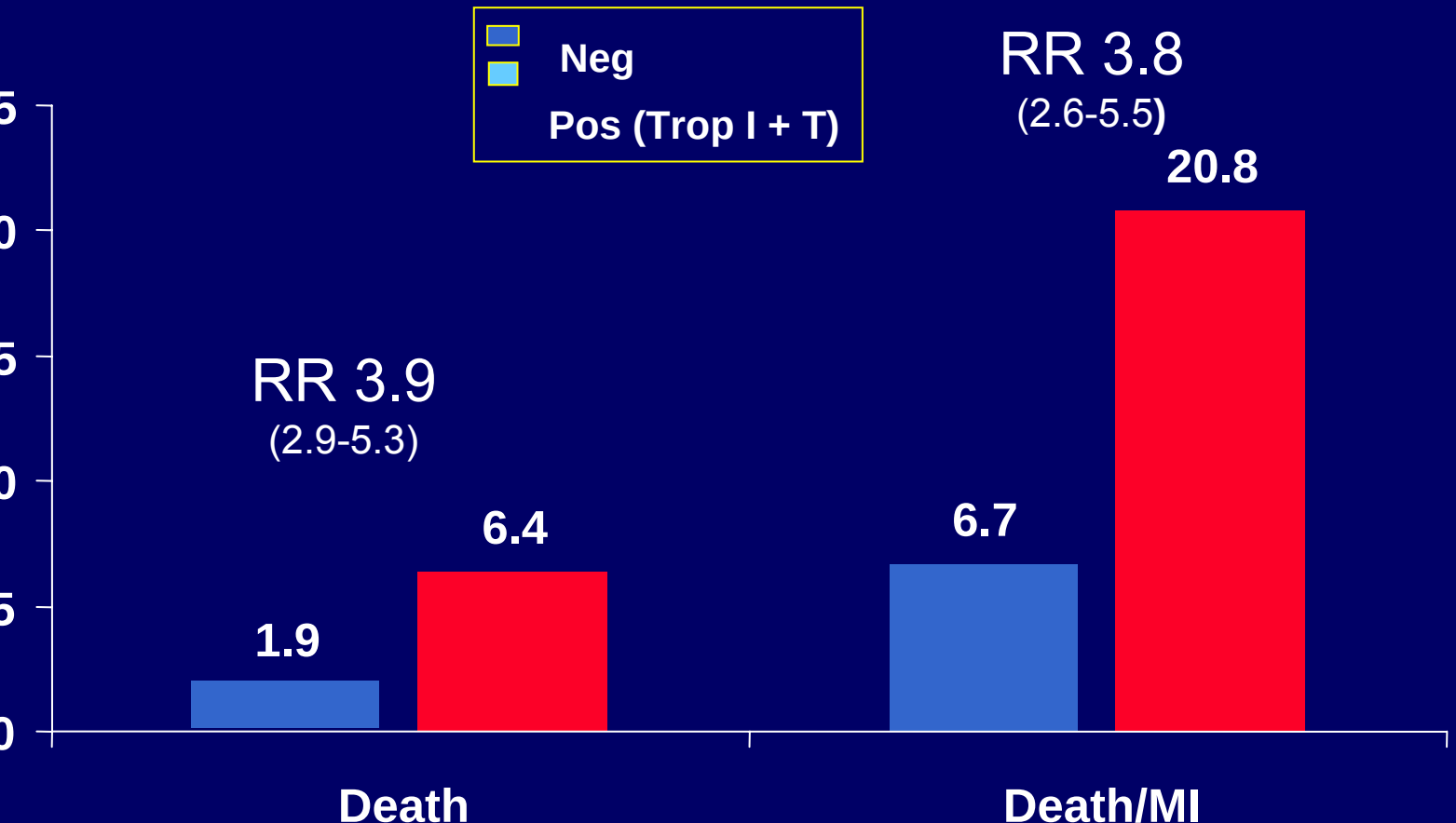
ROPONINS :

- Very specific and more sensitive than CK
- Rises 4-8 hours after injury
- Remains elevated for 7-10 days
- Provide very useful prognostic information

Linear relationship between the level of troponin T or I & subsequent risk of death

- The higher the troponin, the higher the mortality risk

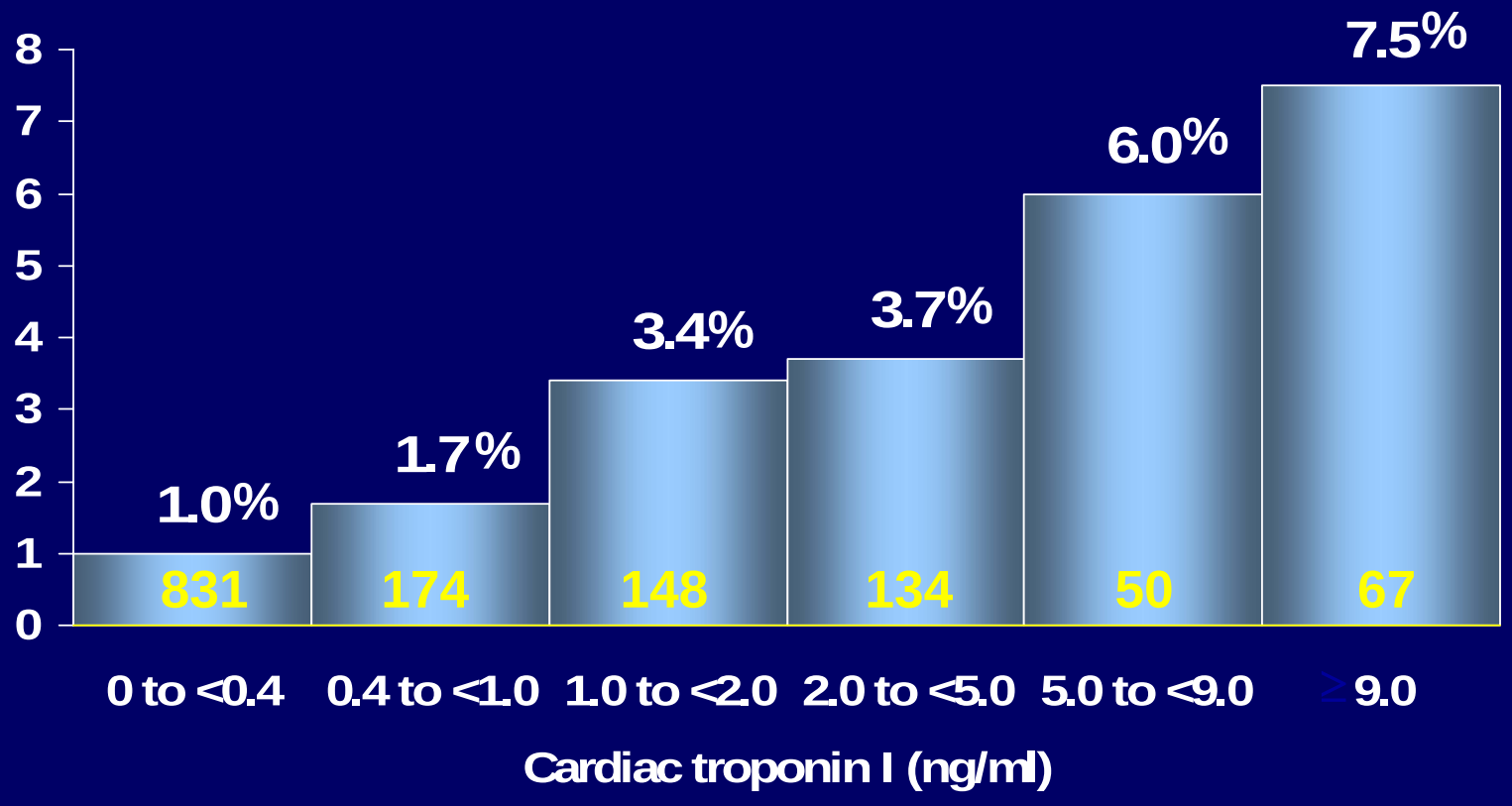
rognostic Value of Troponin T or I in ACS: A Meta-Analysis



-A higher risk of MI was observed with lower vels of troponin in several studies, & thus the erall rate of death or MI is equally high among tients with low or higher troponin values.

-Troponin T & I are useful not only in agnosing MI but also in risk assessment & in rgeting therapies to high risk patients.

nin I Levels and Mortality in Patients with NSTE-ACS



-REACTIVE PROTEIN:

-**CRP is very promising**. Elevated CRP has related to

-increased risk of death

-MI

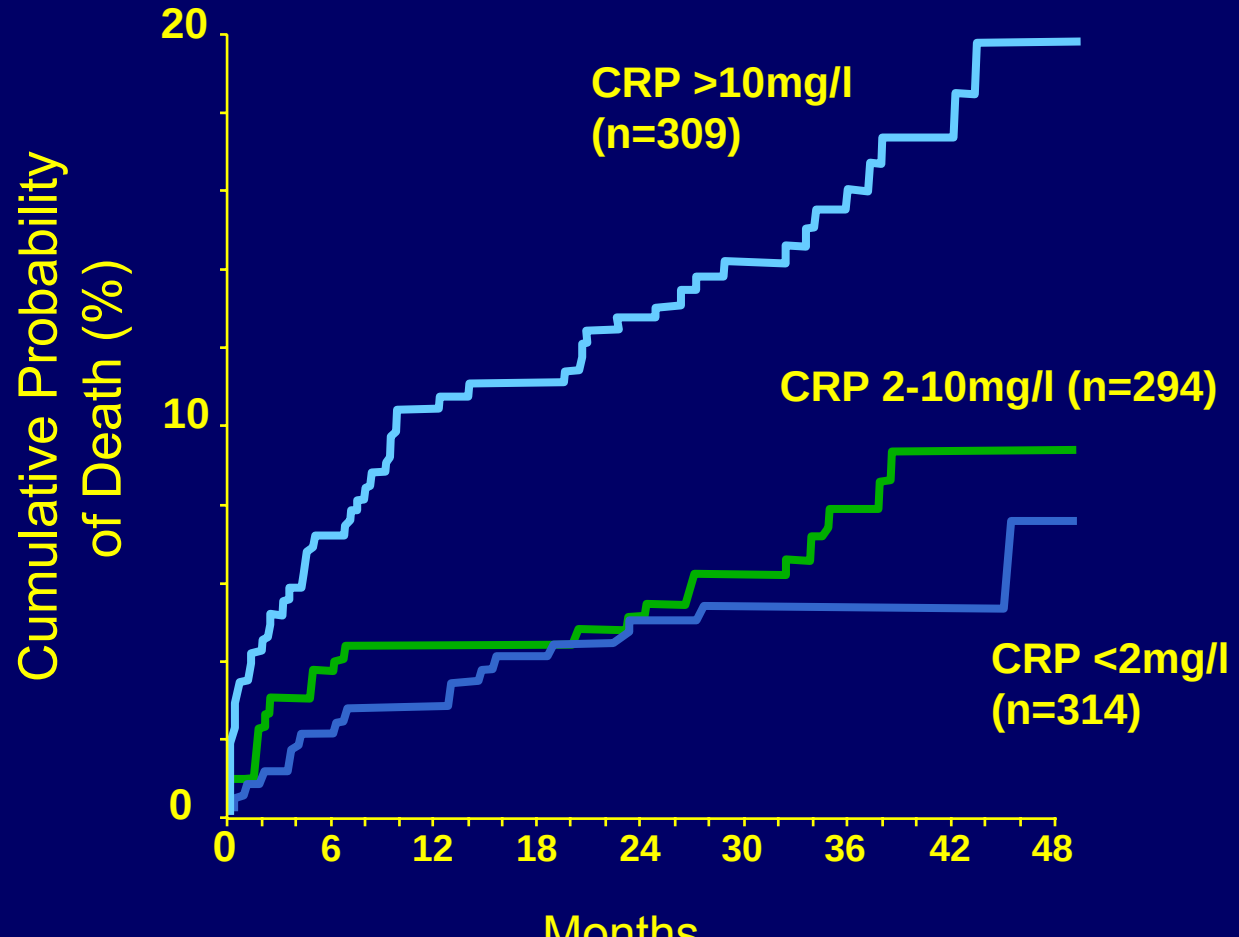
-need for urgent revascularization.

-**levels of CRP** in patients with ACS are oximately five times higher than those of stable nts.

-**<u>CRP was able to discriminate</u>** a high- & a
w-risk group: mortality for patients with an
evated CRP was 5.8% versus 0.4% for patients
thout elevated CRP.

-**<u>Mortality can be stratified</u>** from
0.4% for patients with both markers negative
.7% if either CRP or troponin was positive
9.1% if both were positive.

Predictive Value of hs-CRP
r Mortality from ACS in FRISC Substudy



-**CRP measured at the time of hospital scharge** has been found to be a strong predictor outcome over 3 to 12 month.

Other inflammatory markers

have offered consistent evidence of an association between systemic inflammation & recurrent adverse events , including

serum amyloid A

monocyte chemoattractant protein-1(MCP-1).

HITE BLOOD CELL COUNT:

mpler marker of inflammation

evated WBC counts were ass. with
gher risk of mortality & recurrent acute
I

his association was independent of CRP.

CD40 LIGAND :

D40L is a member of tumor necrosis factor-
pha family of proteins.

pressed on the platelet surface when platelets
e activated

subsequently cleaved, generating a soluble
rolytic fragment termed sCD40L.

-it has been found to be both prothrombotic
roinflammatory & to have a role in
erosclerotic process.

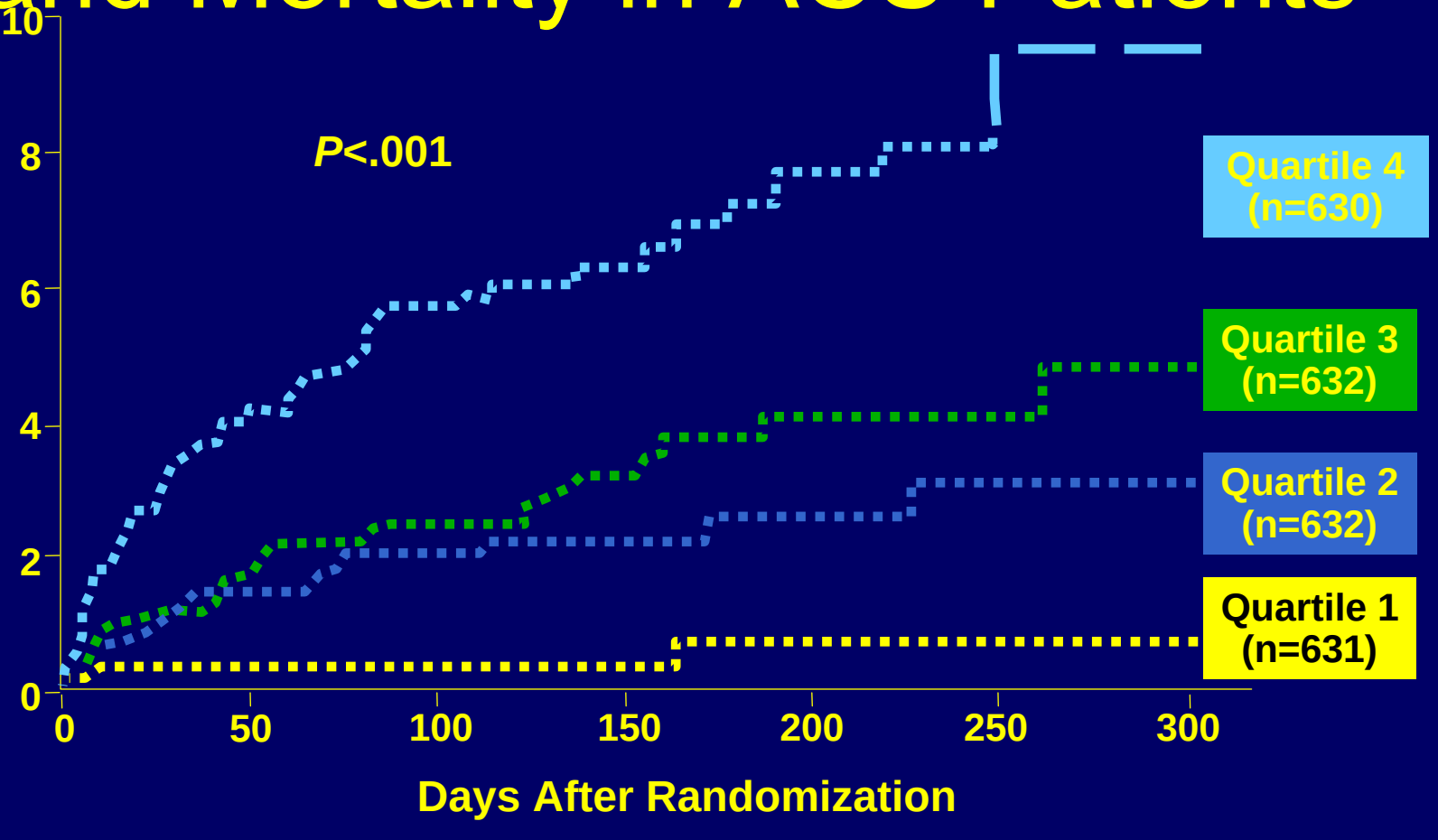
-CD40L has been correlated with the
ree of platelet activation, as measured by
elet monocyte aggregates, & thus is a novel
rker of platelet activation.

B-TYPE NATRIURETIC PEPTIDE:

-**BNP is a neurohormone** that is
thesized in ventricular myocardium & released
esponse to increased wall stress.

-**its actions include** :natriuresis,
odilation, inhibition of sympathetic nerve
vity, & inhibition of the renin-angiotensin-
steron system.

type Natriuretic Peptide (BNP) and Mortality in ACS Patients



-**BNP has prognostic value** across the full spectrum of patients with ACS, including those with UA/NSTEMI.

-**Measurement of BNP** in patients with A/NSTEMI is very important to our current ols for risk stratification.

YELOPEROXIDASE(MPO):

MPO is a hemoprotein expressed by
utrophils that possesses potent
oinflammatory properties & that promotes
dation of lipoproteins in vascular atheroma.

Marker of .inflammation

.role of neutrophil in vascular
lammation and ACS

- MPO serum levels in patients with
STE-ACS were associated with increased risk
r
bsequent death
I . independent of other risk factors & other
diac markers.

-Elevations of MPO have been seen
oughout the coronary vasculature in patients
n UA/NSTEMI.

-Serum Creatinine :

levated creatinine was found to be

sociated with an adverse prognosis,

ndependent of other standard risk

ctors.

GLUCOSE :

-Adverse outcomes have been seen among abetic patients with acute MI with elevated lmission glucose values compared with patients ithout hyperglycemia.

-This association was found even among tients without a prior diagnosis of diabetes.

-Adverse oucome also with poor glycemic ntrol, as measured by hemoglobin A_{1c} has een seen in other studies.

raunwald Classification of Risk for Patients with NSTE-ACS

INCAL INDICATORS OF INCREASED RISK IN PATIENTS WITH NSTE-ACS;

History ;

- age more than 70 y
- DM
- post MI angina
- PVD
- Cerebrovascular disease

CLINICAL PRESENTATION;

- Braunwald class II or III (acute ,subacute rest pain)
- Braunwald class B (secondary UA)
- HF
- Hypotension
- Ventricular arrhythmias

ECG ;

ST deviation 0.05 Mv

LBBB

T wave inversion 0.03 Mv

Cardiac markers

Tn T or Tn I

BNP

CK-MB

CD40 LIGAND

GLUCOSE

CREATININE

HBA1c

ANGIOGRAM ;

Thrombus

3 VD

REDUCED EF

-COMBINED RISK ASSESSMENT SCORES.

- Comprehensive risk scores that use clinical riables, findings from ECG, & findings from serum rdiac markers.

- the most important baseline determinants of higher ortality were:
  - -increasing age.
  - -increasing heart rate.
  - -lower systolic BP.
  - -ST segment depression.
  - -signs of heart failure.

TIMI Risk Score

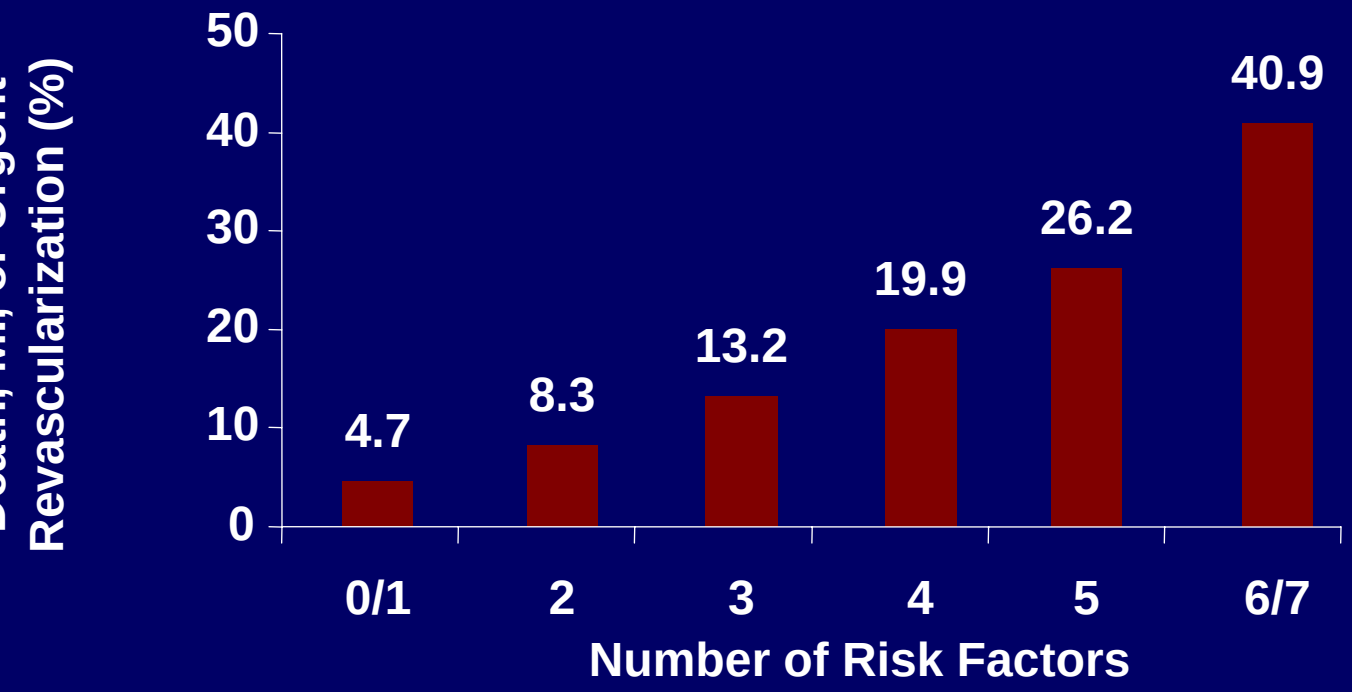
redicts risk of death, new/recurrent MI, need for urgent revascularization within 14 days

- ≥65 years
- CAD Risk Factors
- r Coronary Stenosis >50 %
- leviation
- Anginal events ≤24 hours
- in last 7 days
- ated Cardiac Markers (CK-MB or troponin)

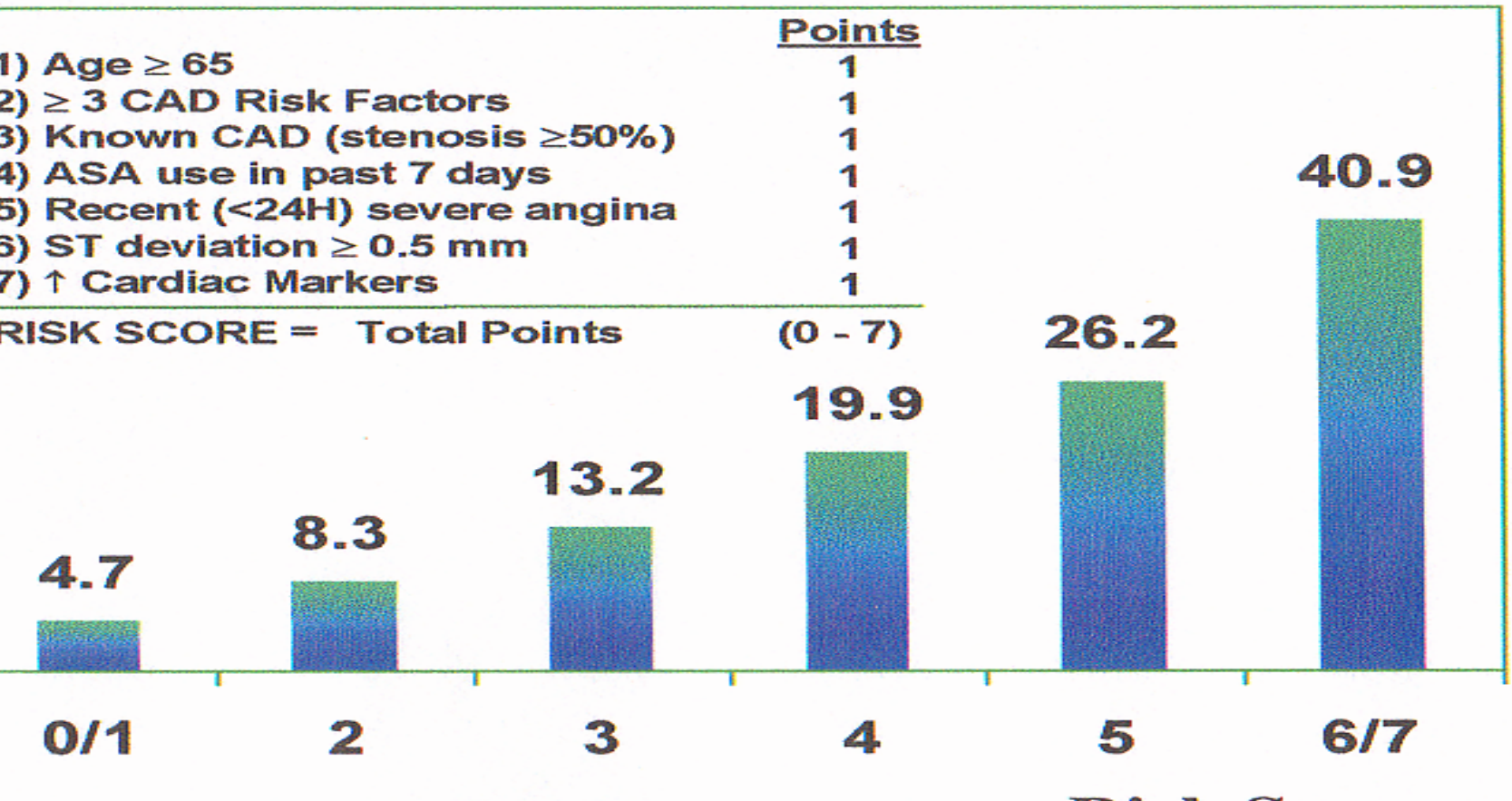
is scoring system was used to
atify the risk for patients across a 10
ds gradient of risk

om 4.7 % to 40.9 % (p<0.001)

The TIMI Risk Score and Incidence of Adverse Ischemic Events in Patients with NSTE-ACS



Risk Stratification



he strongest prognostic markers

- ***CRP*** ; marker of inflammation initiator of atherosclerosis
- ***BNP***; reflect impaired LV function
- ***Tn*** ;the most sensitive and specific marker of myocyte necrosis

tients with higher TIMI risk scores ;

d significant reductions in events when
eated with ;

Enoxaparine compared with ufh (heparin)

With a GPII B/III A inhibitor compared with
lacebo .

with an invasive vs conservative strategy.

Thank you