

# Markers of plaque instability in the early diagnosis of acute myocardial infarction

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# Presenter's Disclosure Information

- **Swiss National Science Foundation**



-  Schweizerische Herzstiftung  
Fondation Suisse de Cardiologie  
Fondazione Svizzera di Cardiologia

-  University of Basel

-  University Hospital  
Basel

-  **Abbott**  **B·R·A·H·M·S**  **Roche**  **SIEMENS**  **BÜHLMANN**

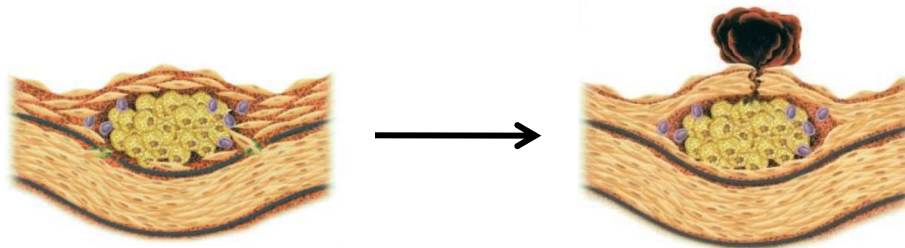


# Background (I)

- Chest pain: 10% of all ED consultations, ~ 15 million patients/year in Europe & US
- Evaluation of chest pain patients is a challenge, is time consuming and causes excessive hospital costs

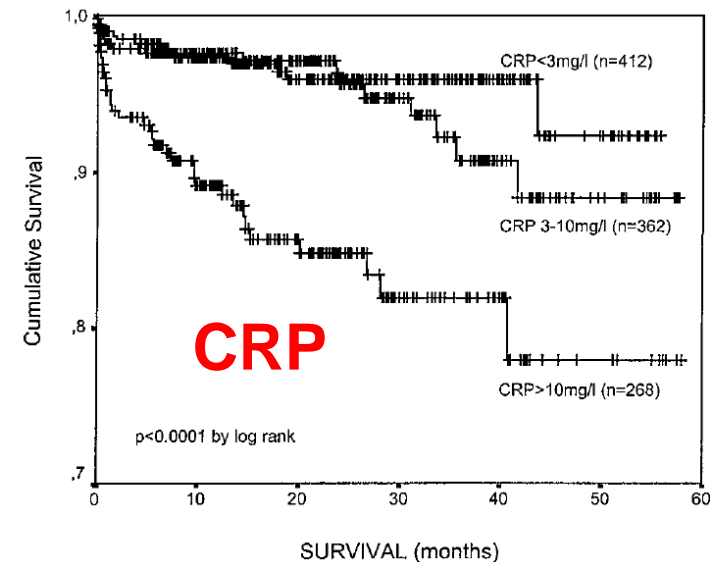
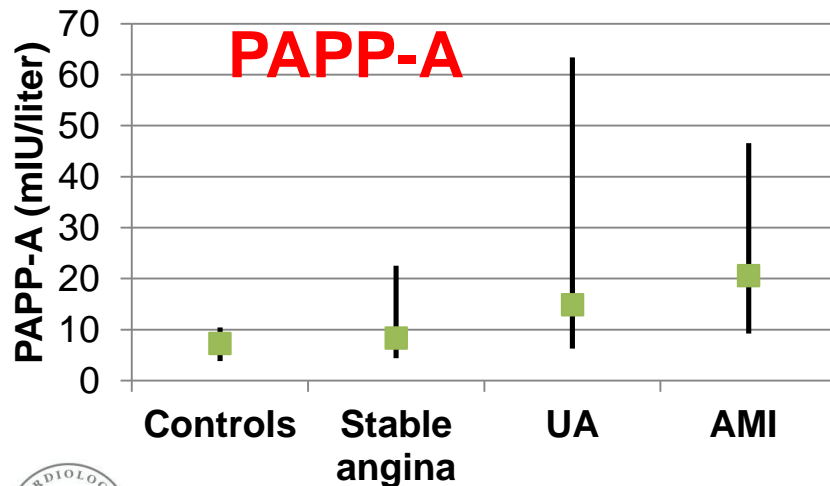
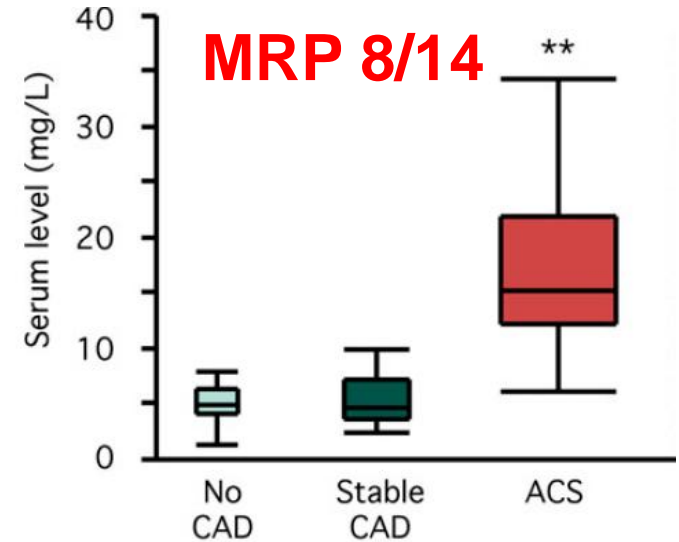
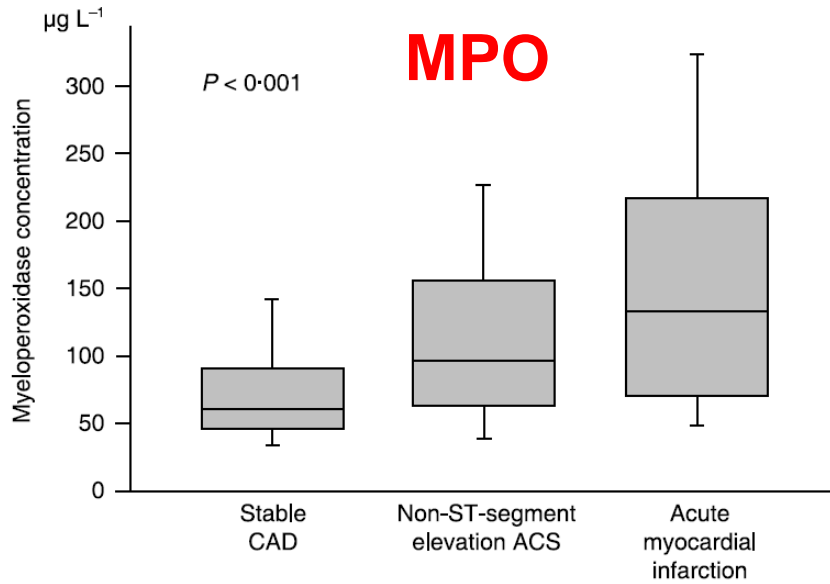


**Early rule out/in of AMI is an unmet clinical need**



-> **Markers of the instable vulnerable plaque** have been suggested as a tool to address the early diagnosis of AMI

# Background (II)



Ndrepepa, EJCI 2008;38:90; Altwegg, EHJ 2007;28:941

Bayes-Genis, NEJM 2001;345:1022; Mueller, Circulation, 2002;

# Aim

To prospectively investigate the **diagnostic accuracy** of 4 available markers of plaque instability (MPO, MRP 8/14, PAPP-A, CRP) in **662 consecutive ED patients** with symptoms suggestive of AMI

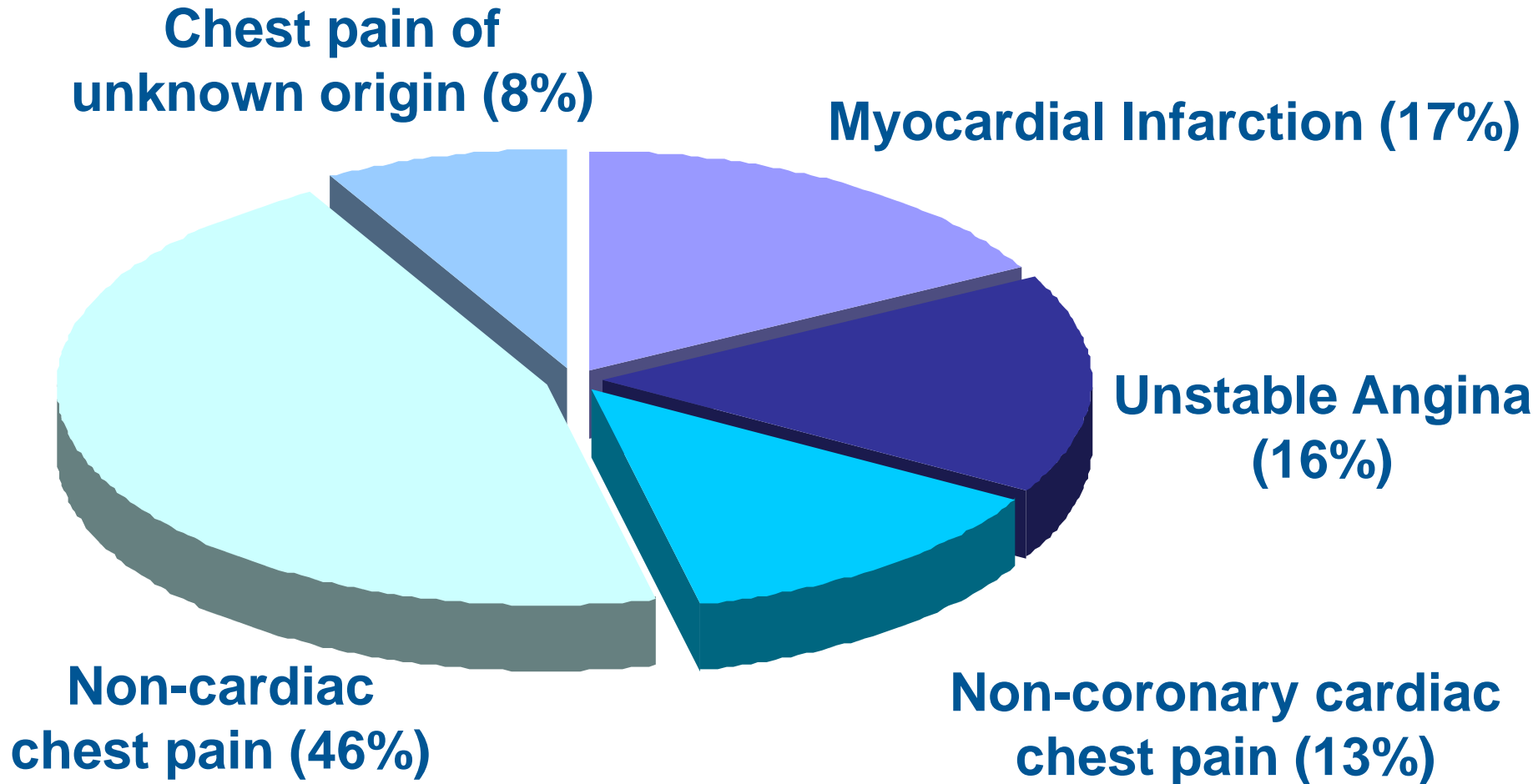
# APACE - Study

- **Advantageous Predictors of Acute Coronary Syndrome Evaluation**
- Prospective observational international multicenter study
- **Inclusion Criteria:**
  - Pts with chest pain or other symptoms suggestive of AMI
  - with onset of symptoms or peak within the last 12 hours
- **Adjudicated Final Diagnosis:**
  - Centrally adjudicated by two independent cardiologists after review of all available medical records/results pertaining to pt.
  - Dx of AMI based on **local standard troponin assays**
- **Blood Sampling:** heparin-naive at presentation; EDTA plasma (MPO), Serum (MRP 8-14 & PAPP-A) resp. Heparin plasma (CRP)

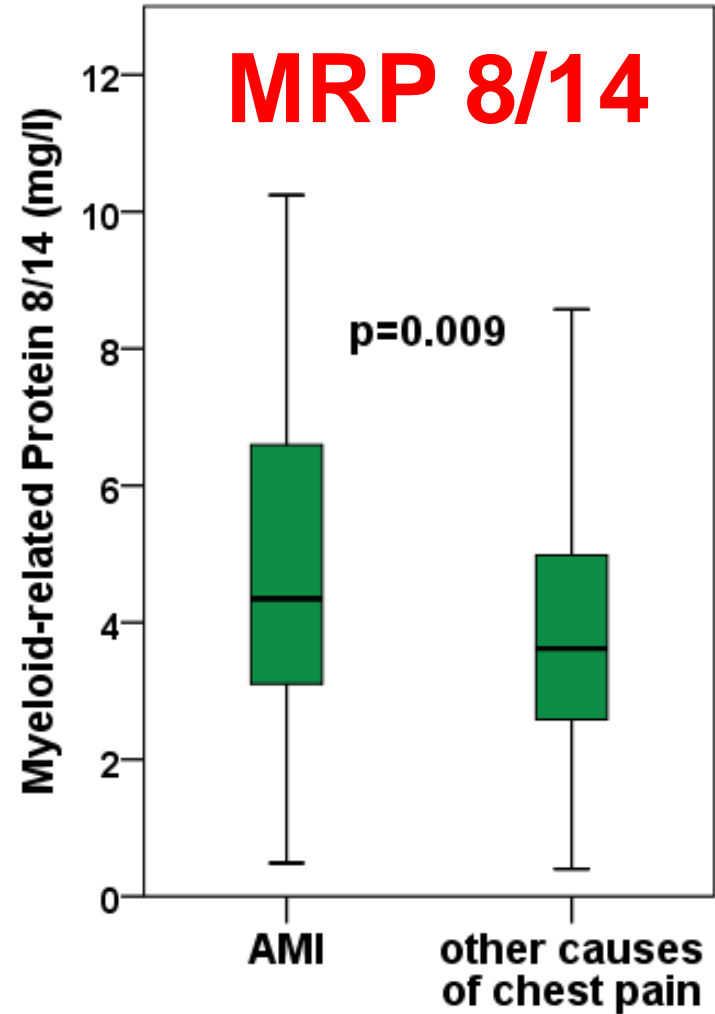
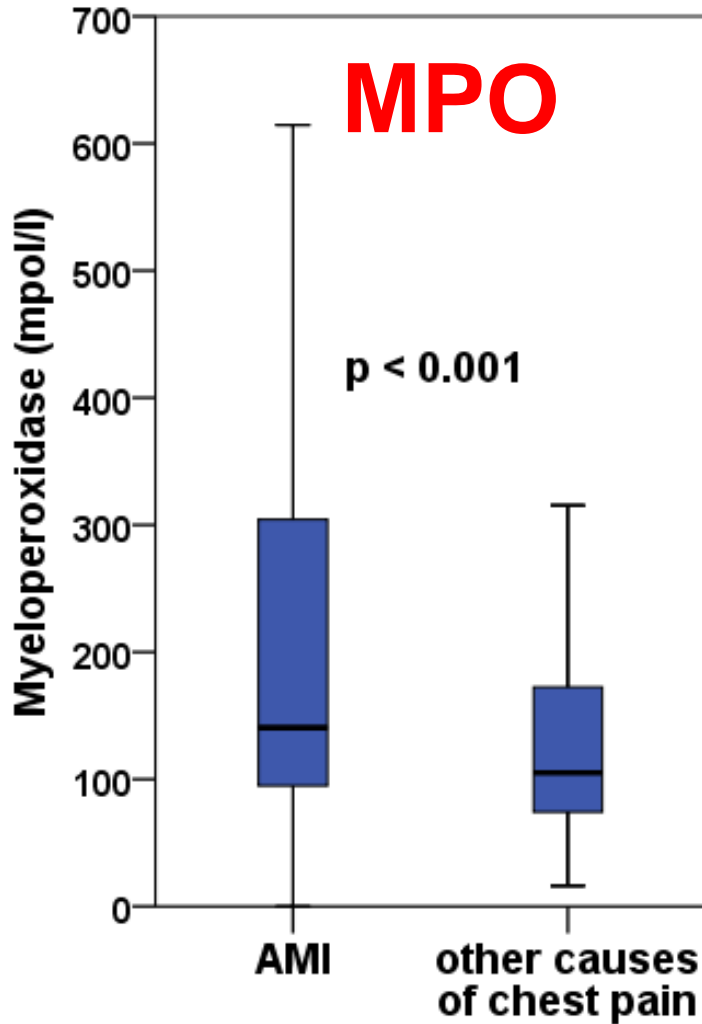


# Causes of Chest Pain in the ED

**n = 662 patients**

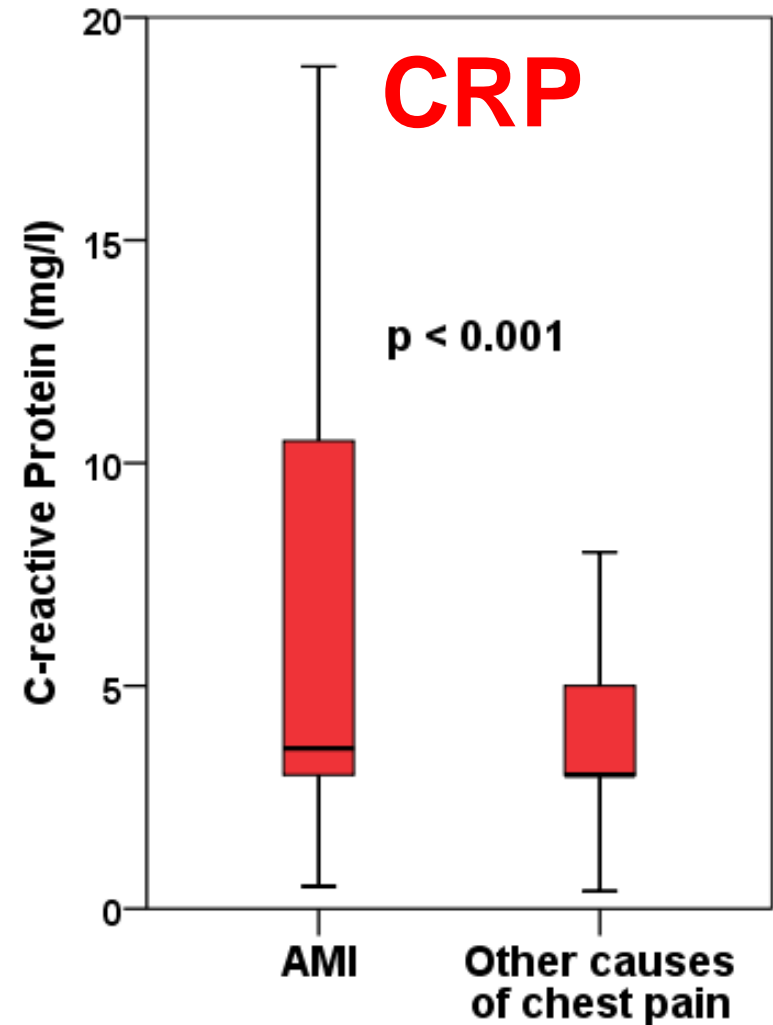
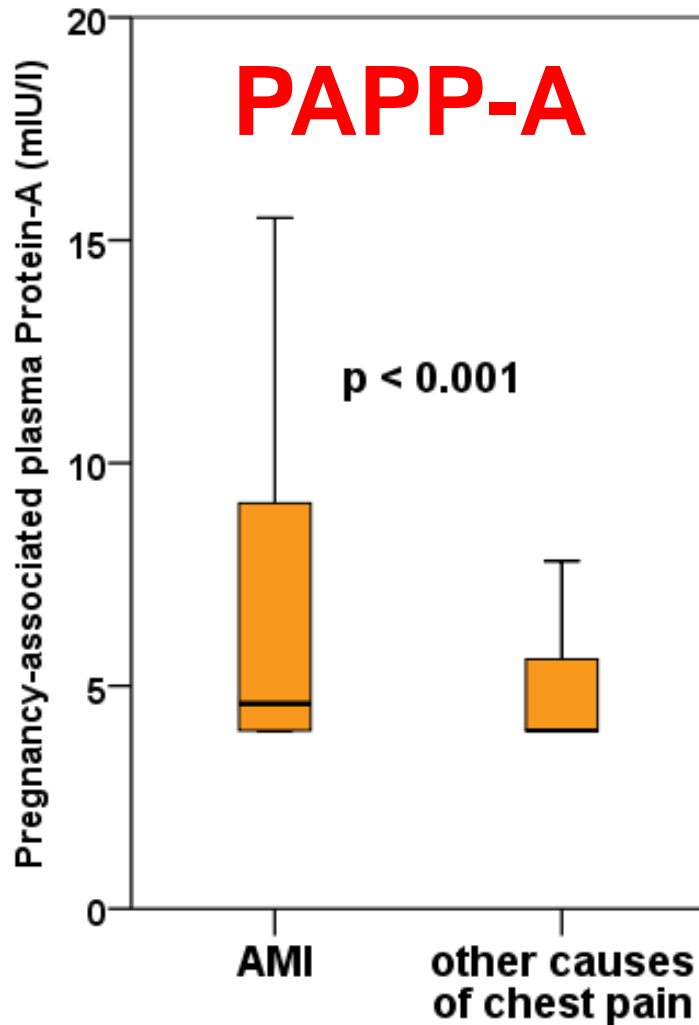


# Levels of markers of Plaque instability (I)

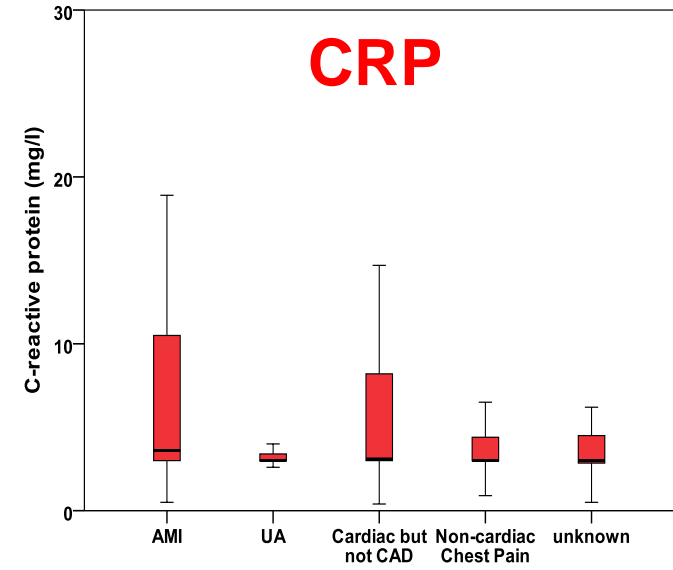
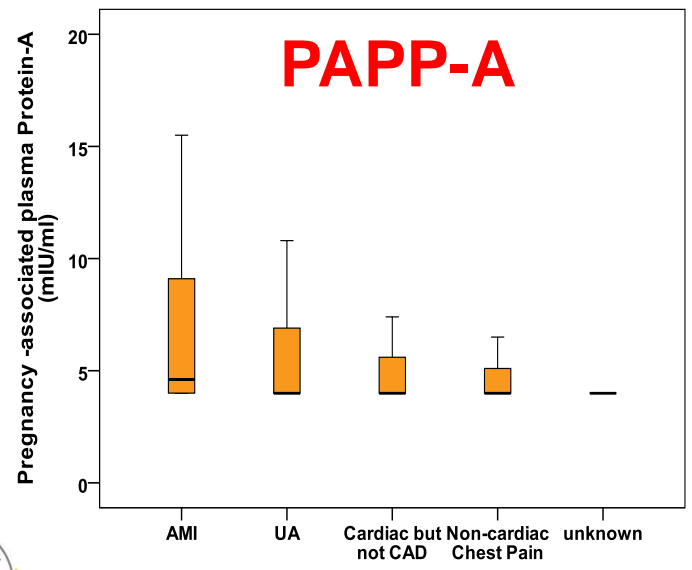
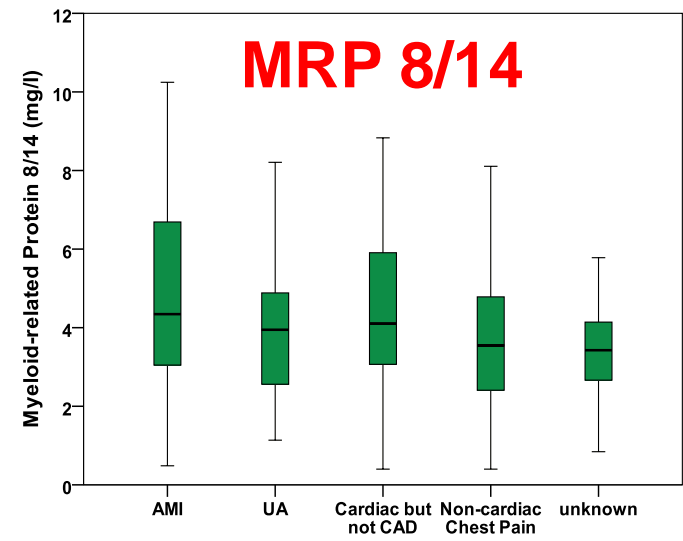
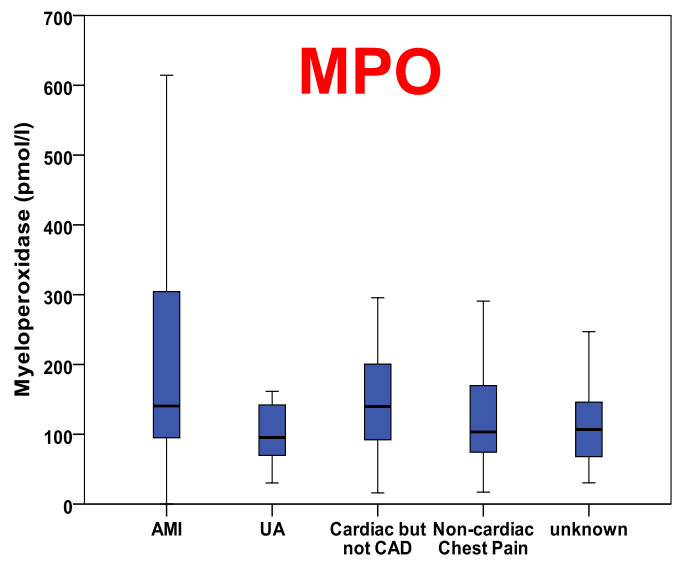




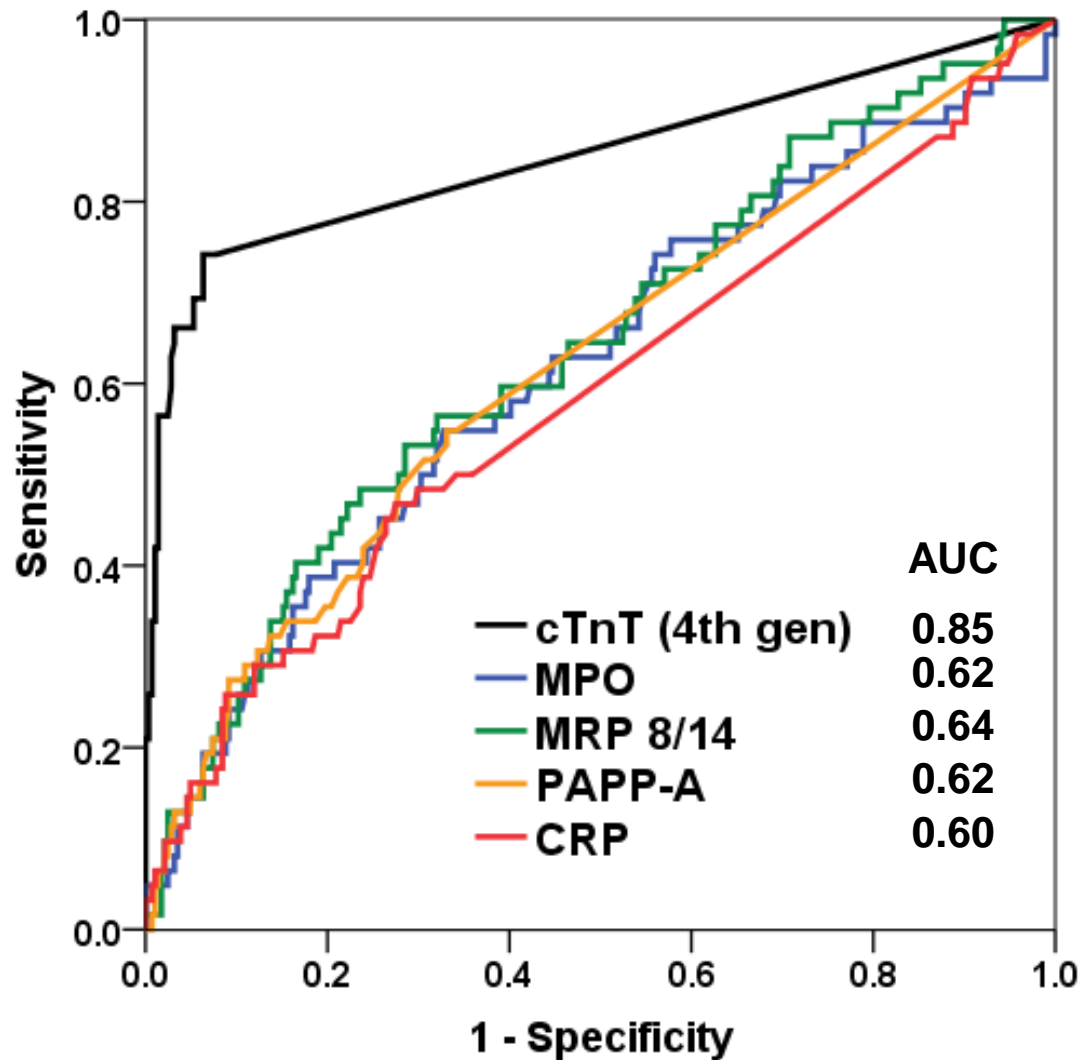
# Levels of markers of Plaque instability (II)



# Levels of markers of Plaque instability (III)



# Diagnostic accuracy of the four markers of plaque instability for AMI



# Discussion

- no cardiac specificity -> confounding by other conditions (systemic inflammation!)
- systemic levels  $\neq$  local levels in coronary sinus
- **Heparin!!!** (MPO: Baldus, Circulation 2006; PAPP-A: Iversen, Clin Biochem 2011)
- other/better markers of plaque instability?

# Conclusions

- 1) Levels of all four biomarkers of plaque instability were significantly higher in patients with AMI as compared to patients without.
- 2) The overlap between diagnostic groups however was significant and the diagnostic accuracy of the markers was poor (AUC ~0.60-0.64) compared to cTnT 4<sup>th</sup> generation (AUC 0.85).
- 3) Measurement of currently available biomarkers of plaque instability in the peripheral blood does not seem to be helpful in the early diagnosis of AMI.