

DECREASING TIME TO DIAGNOSIS IN PATIENTS WITH ACUTE CHEST PAIN

The incremental cost-effectiveness of implementing a multiple biomarker assay for early exclusion of NSTEMI

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BACKGROUND

- A large proportion of all emergency hospital admissions are due to chest pain¹.
 - Majority of these patients do not have an acute myocardial infarction.
- ECG is insufficient to exclude non ST-elevation myocardial infarction (NSTEMI)².
- **Therefore:** laboratory markers are crucial to achieve early exclusion of NSTEMI.
 - Consequences:
 - ✓ Earlier patient discharge
 - ✓ Possible cost savings³.

OBJECTIVE

Examine the incremental cost-effectiveness of a multimarker assay, compared to the current high-sensitive troponin assay, in excluding NSTEMI in patients with acute chest pain.

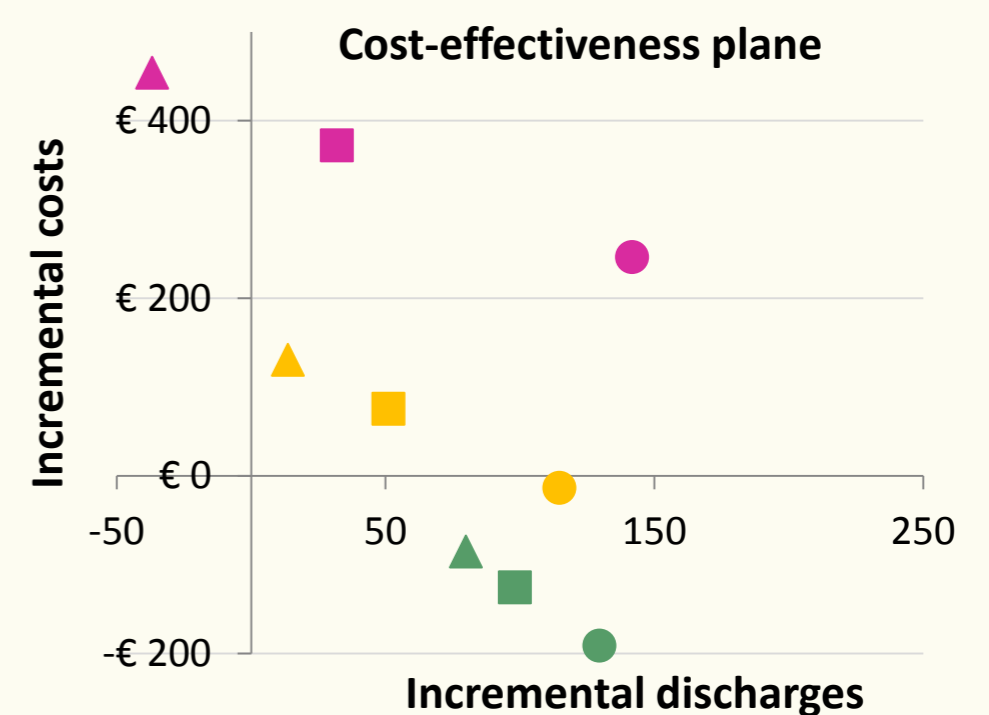
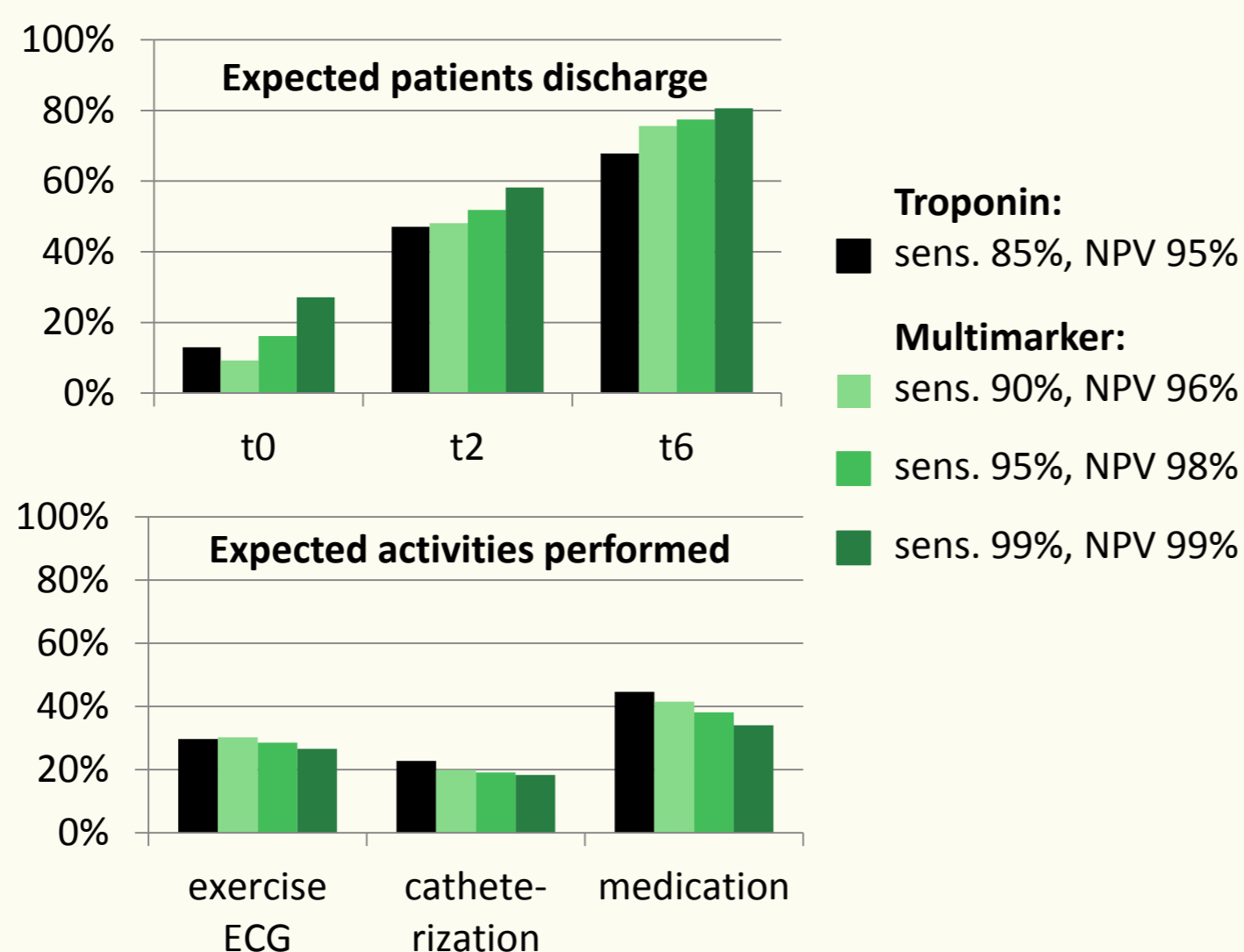
METHODS

- **Multimarker:** combined measurement of myeloperoxidase, copeptin, and high-sensitive troponin.
- **Questionnaire** among 10 cardiologists.
 - **Focus:** influence of multimarker on patient's discharge and diagnostic activities performed.

Evaluation of:

- A range of sensitivities and negative predictive values (NPVs) of the multimarker.
 - Based on literature analysis.
- Three implementation strategies:
 - I. Multimarker assay at the time of a patient's entrance at the hospital (t0).
 - II. Multimarker plus one troponin measurement after two hours (t2).
 - III. Multimarker plus troponin measurements after two and six hours (t2 and t6).

RESULTS



Sens. (%)	NPV (%)	Strategy		
		I	II	III
90	96	▲	▲	▲
95	98	■	■	■
99	99	●	●	●

DISCUSSION

- Early economic evaluation, therefore:
 - Relatively much uncertainty in input variables.
 - Interpret results cautiously.

CONCLUSION

- Increased analytical performance by multimarker⁴.
- Therefore, we recommend implementation of the multimarker with troponin assays at t2 and t6.

RECOMMENDATIONS

- Further research is necessary.
 - Specify patients in categories (low, intermediate and high risk of myocardial infarction).
 - Development should focus on point-of care tests.

LITERATURE

1. Bassand, J.P., et al., *Guidelines for the diagnosis and treatment of non-ST-segment elevation acute coronary syndromes*. Eur Heart J, 2007. **28**(13): p. 1598-660.
2. Wang, K., R.W. Asinger, and H.J. Marriott, *ST-segment elevation in conditions other than acute myocardial infarction*. N Engl J Med, 2003. **349**(22): p. 2128-35.
3. Forberg, J.L., et al., *Direct hospital costs of chest pain patients attending the emergency department: a retrospective study*. BMC Emerg Med, 2006. **6**: p.6.
4. Keller, T., et al., *Copeptin improves early diagnosis of acute myocardial infarction*. J Am Coll Cardiol, 2010. **55**(19): p. 2096-106.