A multidisciplinary approach-

Focus on patient outcomes

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Quality of care according to Donabedian

- Best patient outcome to the lowest possible cost

- How can we add value to this?

Focus in this presentation

Evidences; from process to outcome

Process	Outcomes			
	Mortality	Morbidity	Health Care Contacts	Costs
↓DRP				
↓ Medication Errors				
↓ ADE ADR				
↑ Compliance				
↑ Appropriateness				

Cochrane Effective Practice and Organisation of Care Group, 150 reviews

- Clinical pathways: effects on professional practice, patient outcomes, length of stay and hospital costs
- Discharge planning from hospital to home
- Hospital at home admission avoidance
- Interventions for improving outcomes in patients with multimorbidity in primary care and community settings
- Medication review in hospitalised patients to reduce morbidity and mortality

Christensen M, Lundh A. Medication review in hospitalised patients to reduce morbidity and mortality.
Cochrane Database of Systematic Reviews 2013, Febr 28

Authors' conclusions

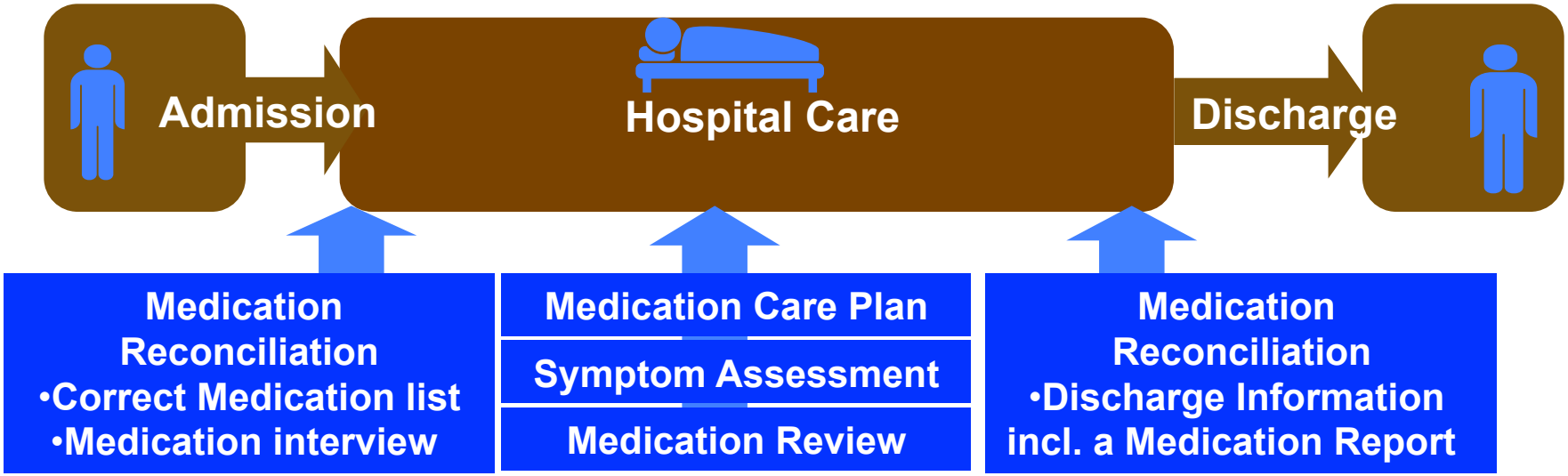
- It is uncertain whether medication review reduces mortality or hospital readmissions, but medication review seems to reduce emergency department contacts.
- However, the cost-effectiveness of this intervention is not known and due to the uncertainty of the estimates of mortality and readmissions and the short follow-up, important treatment effects may have been overlooked.
- Therefore, medication review should preferably be undertaken in the context of clinical trials. High quality trials with long follow-up are needed before medication review should be implemented.

Aim and objectives for development of the LIMM (Lund Integrated Medicines Management) model

Develop and research a systematic model for improved medication use during a patient hospital stay.

- Analyse problems and limitations in the standard patient medication care process
- Develop a structured team-based model
- Study the process and outcomes

The LIMM-model



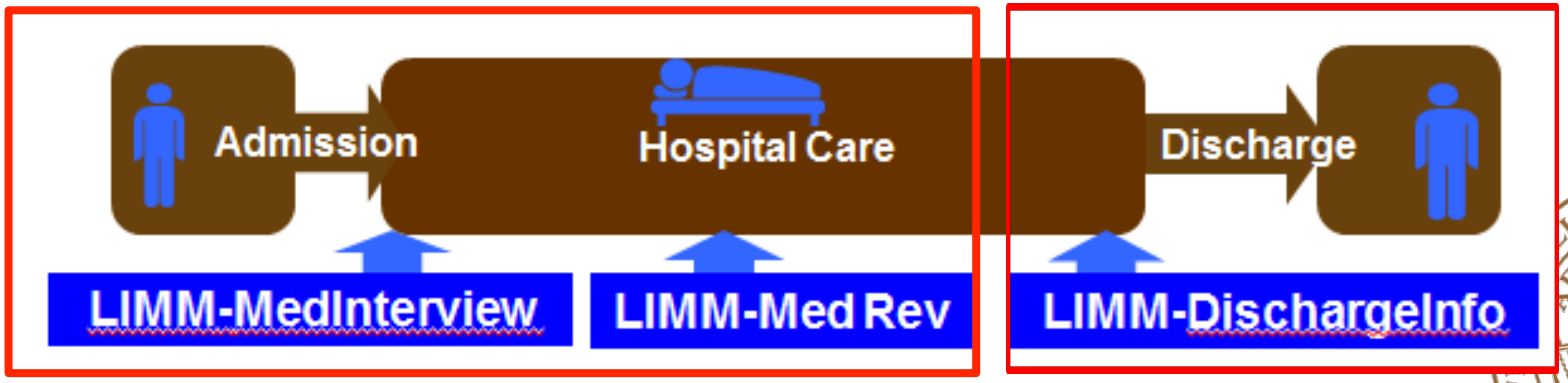
A systematic approach to individualise and optimise drug treatment

Research: Methods

- Design:
  - Descriptive studies to investigate problems
  - Comparative controlled studies to investigate improvements
  - Blinded evaluators for errors, consequences and clinical significance
  - Study size based on power calculations
- Analyses:
  - Descriptive and comparative statistics
  - Trend, regression and survival analysis
  - ITT and PP analysis
  - Probabilistic decision tree model

Outcomes from the LIMM-model 1 (2)

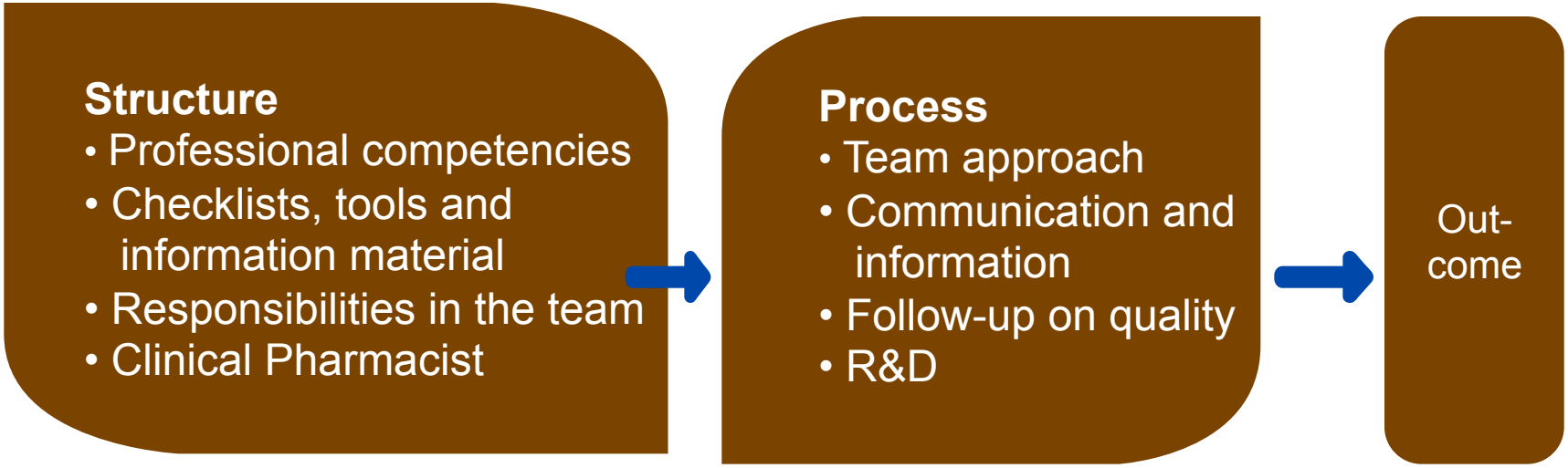
- LIMM-MI and LIMM-MR decreased drug related hospital revisits from 12.0 to 5.6% (p=0.047) (Hellström 2011)
- No effect on total hospital revisits (Hellström 2012b)
- LIMM-DI decreased health care contacts from 8.9 to 4.4% (p=0.049) (Midlöv 2008b)



Outcomes from the LIMM-model 2 (2)

- For each hour spent by a pharmacist physicians and nurses saved; (Eriksson 2012)
  - 1½-2 h at hospital
  - ½-1 h in primary care
- The total model generate savings of €390 and gained utility of 0.005 for each patient. The model is cost saving at a 98% chance (Ghatnekar 2013).
- Physicians/nurses very satisfied (process, pharmacist) (Bergkvist 2011, Bondesson 2012)

Quality assurance in the LIMM-model

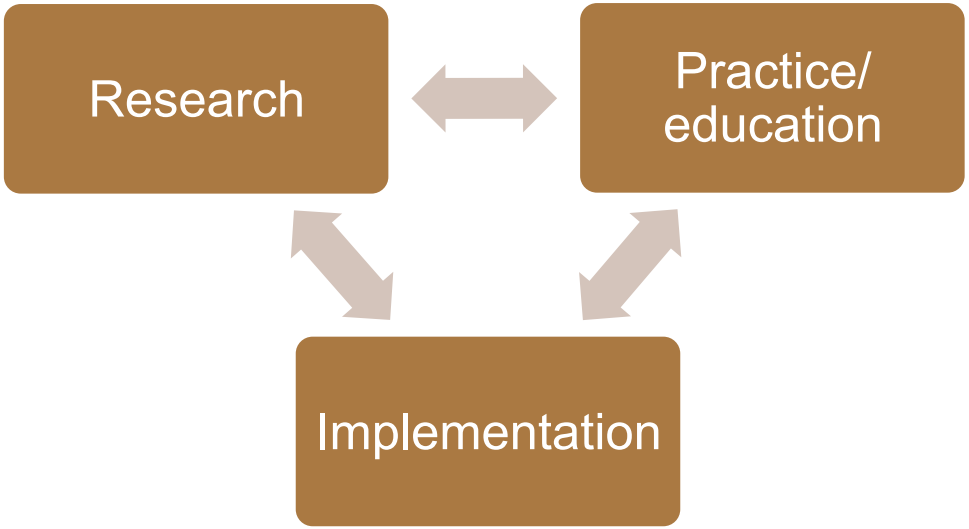


Using the same structure and process (and prove it) the LIMM-model can be implemented in similar settings and the outcomes guaranteed

Documentation and Implementation

- 4 PhD- and 30 Masters- thesis, 19 scientific publications
- 4 national quality and research awards
  - Best innovation in Swedish health care in 2009
- Implementation
  - Mandatory at Lund University Hospital 2005 (LIMM-DI)
  - National patient safety action plan 2008
  - Skåne County Council incentives, pay for performance 2011
  - Amendment to National constitution 2012
  - All 8 acute hospitals in Skåne, 50 clinical pharmacist employed
  - Spreading in Sweden and implemented in Mid-Norway
- Further development in primary care and psychiatry

Reason for success



Among prescribed medications
80% are filled in a pharmacy

70% of those are used

50% of those are used correctly

=<30% are filled and used correctly

Importance of improving patient compliance

- High compliance is associated with lower risk of death and hospital admissions in patients with heart failure regardless treatment with candesartan or placebo (DB, RCT, 7 600p, 3y) (Granger Lancet 2005)
- Compliance to evidence based treatment (statin and beta-blocker) but not to calcium channel blocker reduced mortality after acute myocardial infarction (Cohort, 31 400p, 4y) (Rasmussen Jama 2007)
- Increasing the effectiveness of adherence interventions may have a far greater impact on the health of the population than any improvement in specific medical treatments (WHO 2003)

Key principles of evidence-based medicine

- Population evidence alone is never sufficient to make a clinical decision.
- Practitioners require expertise in interpreting the patient problems and in identifying the evidence for optimal patient treatment.
- EBM requires the incorporation of the client's values and preferences into decision making so that they can agree on the most important objectives.

LIMM-Medication Interview at admission

- Part 1 (correct medication list)
  - 25%, stopped treatment themself, ADR/no-effect
  - 33%, > 1 drug reason for treatment un-known
- Part 2 (compliance, Morisky 4 item)
  - Non-compliant; 34% non-intentional, 17% intentional, 10% both
- Part 3 (attitudes, BMQ specific)
  - 7% more harm than benefit
  - 12% no benefit

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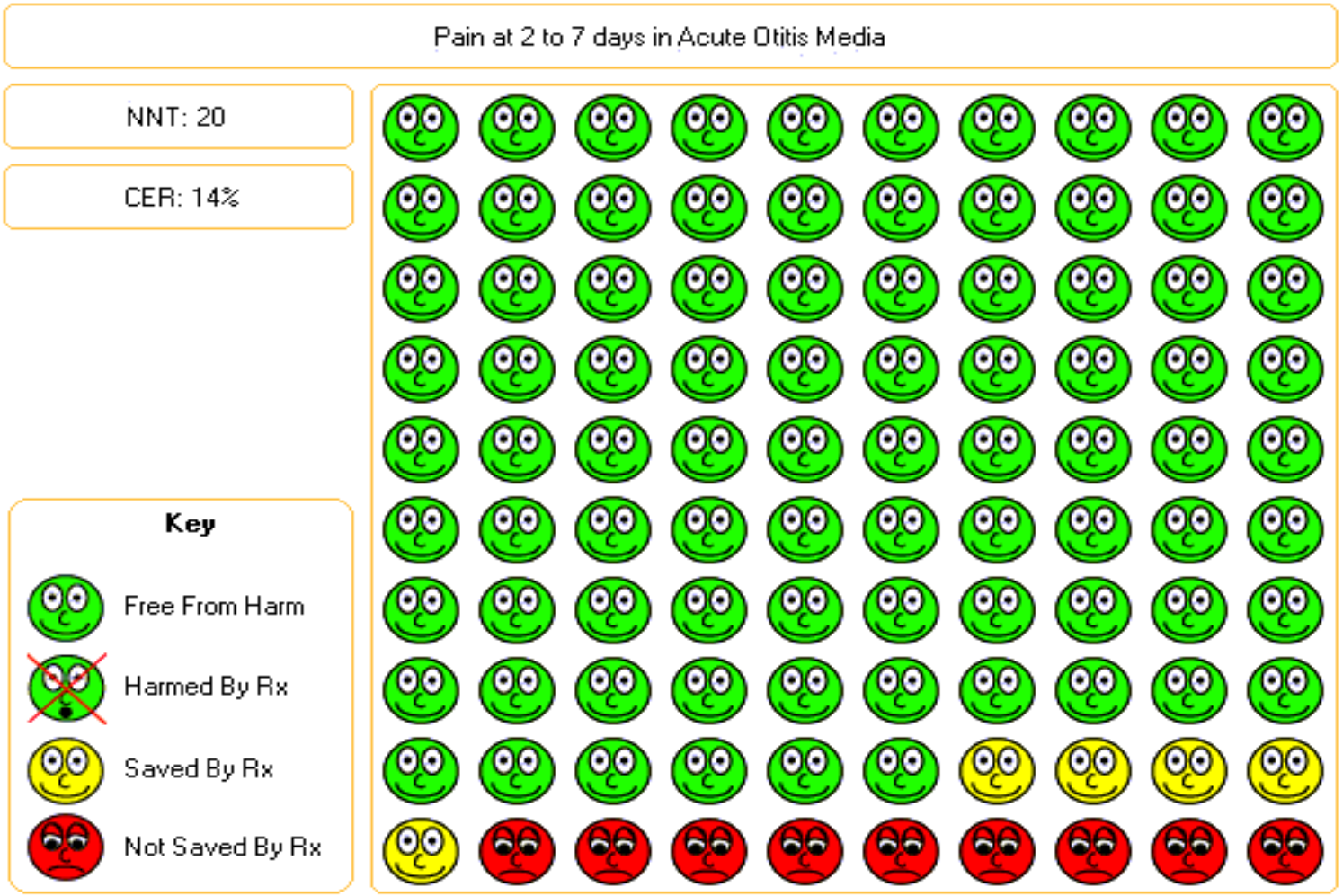
A structured questionnaire to assess patient compliance and beliefs about medicines taking into account the ordered categorical structure of data

Åsa Bondesson MSc Pharm,[1] Lina Hellström MSc Pharm,[2] Tommy Eriksson MSc PhD,[3] and Peter Höglund MD PhD[4]

The full patient perspective, what should we do?

- Identification of patient DRP
  - Non-optimal prescribing
  - Patient involvement and compliance: knowledge, practical aspects, attitudes
  - Intentional and non-intentional patient non-compliance
- The patient as a partner
  - Relevant and evidences based information presented timely and based on the patients background and wishes
  - Systematic Motivational Medication Interviewing

Communicating evidences for improved compliance!?



http://www.nntonline.net/visualrx/

Conclusion

- The LIMM-model
  - identifies, resolves and prevents drug related problems.
  - improves the process of care
  - Improves important outcomes
  - Strong clinical, educational and scientific base
- Next step
  - Using all identified DRP to help patient with compliance issues

Do we need new drugs?
We can not use existing properly!

Thanks

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LIMM-Scientific publications

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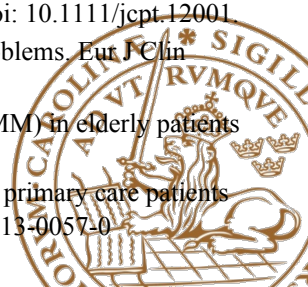
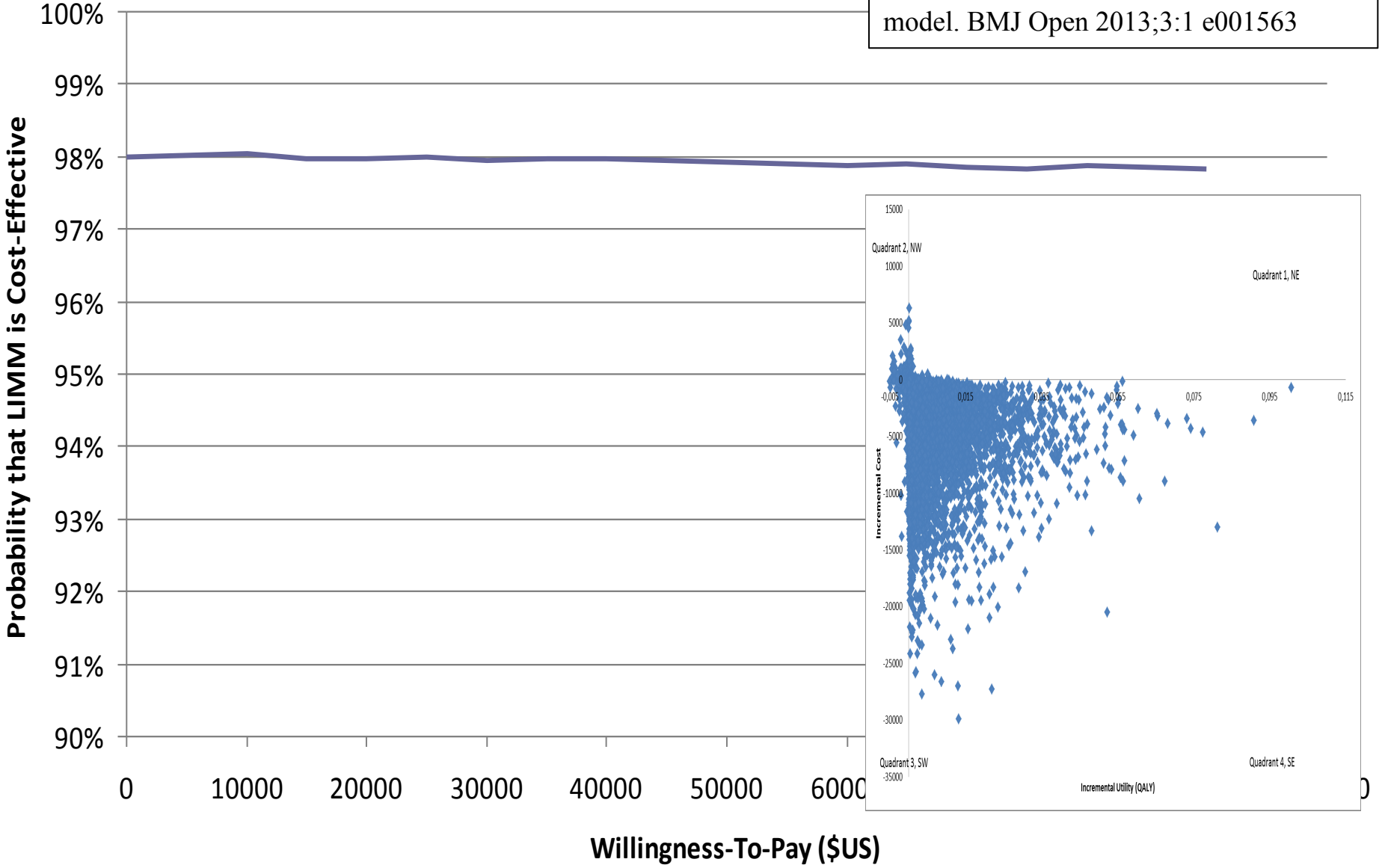


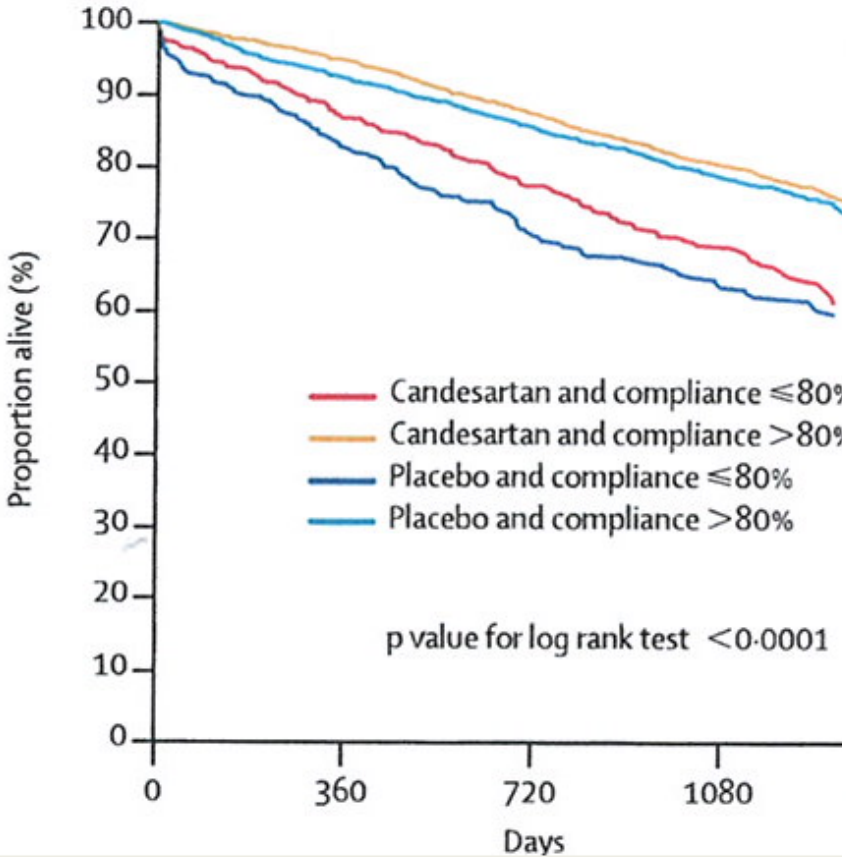
Figure 1. Cost-Effectiveness Acceptability Curve for the LIMM-model (total)

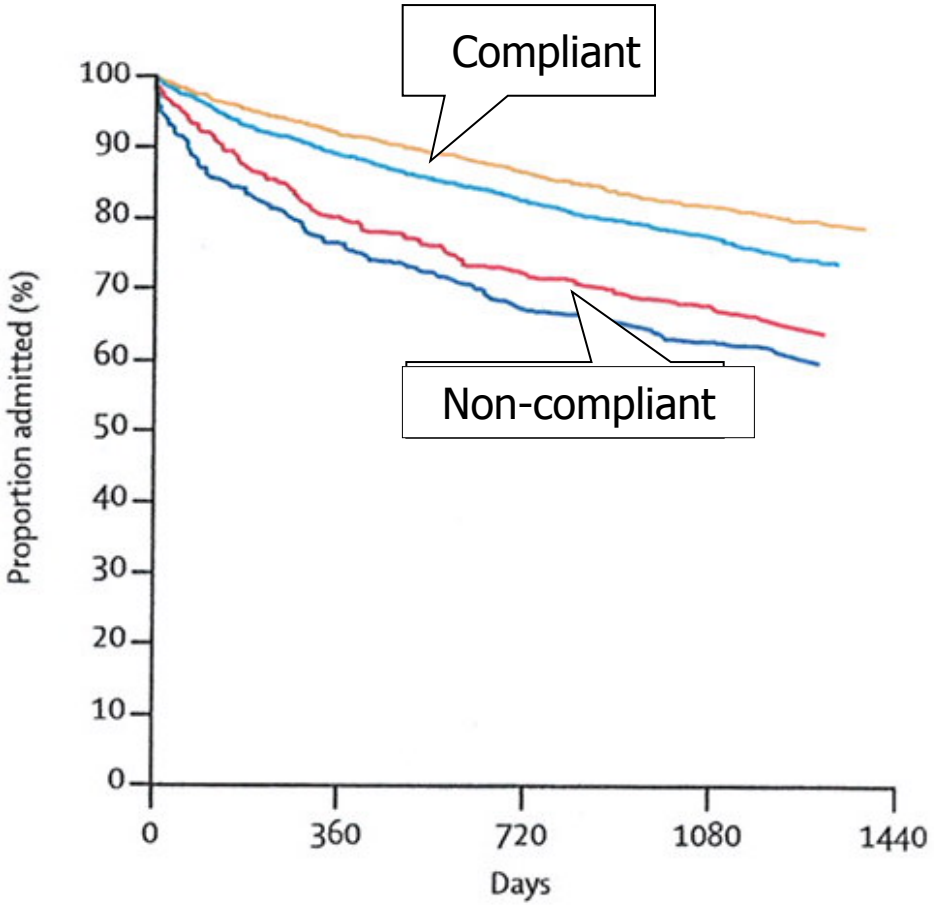
Ghatnekar, Bondesson, Persson, Eriksson. Health economic evaluation of the LIMM-model. BMJ Open 2013;3:1 e001563



Good compliance is associated to lower mortality and hospital admissions in CHF, regardless candesartan or placebo

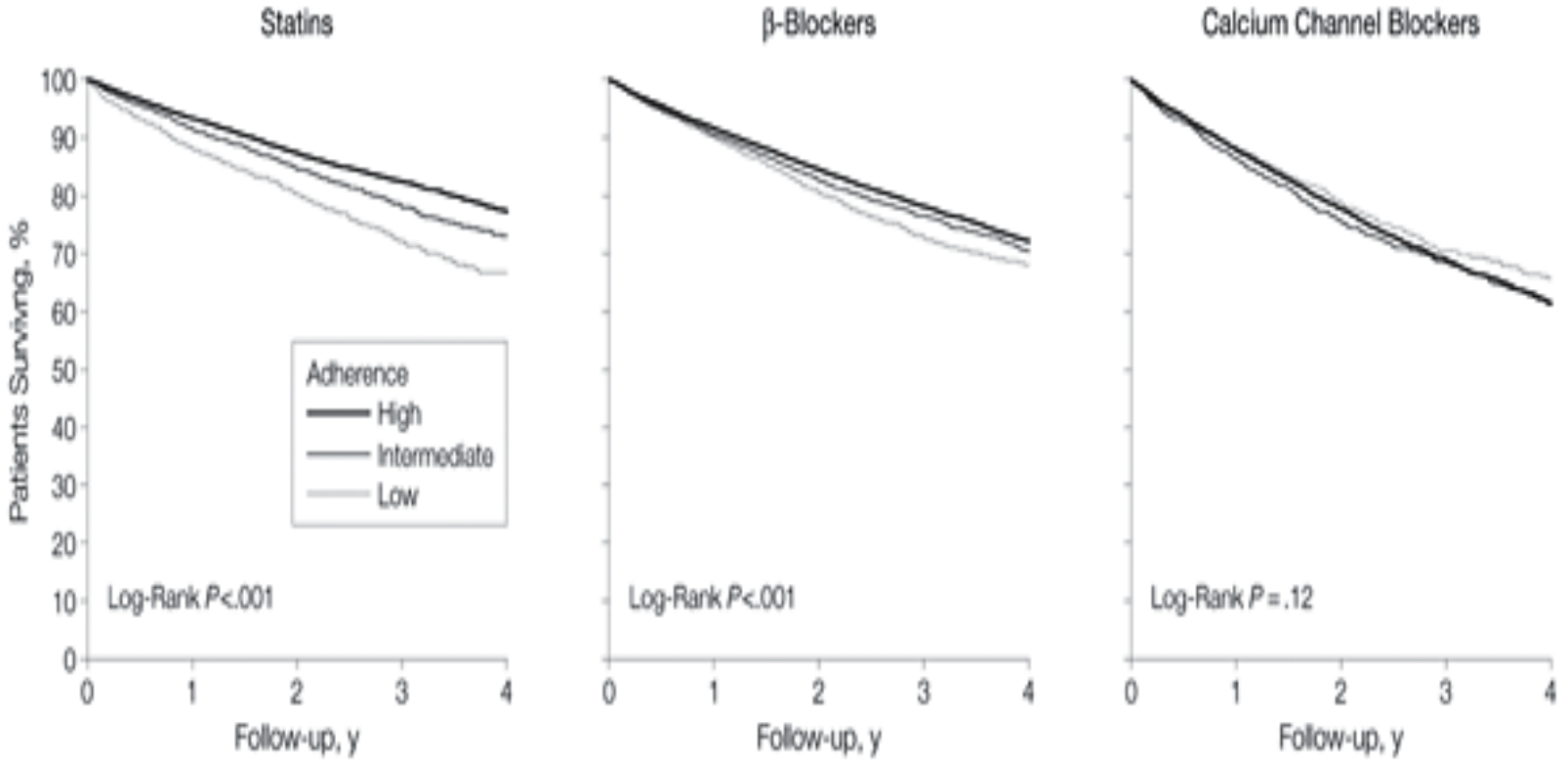
Granger Lancet 2005; RCT, double blind, 7600 patients, >3 years





Compliance to statins and betablockers (EBM) but not to calcium antagonist reduces mortality after cardiac infarction

Rasmussen JAMA 2007; Cohort, 4 years, 31.400 elderly Ontario, Ca



No. at Risk															
High Adherence	14345	13393	8787	5129	2200	17868	16361	11197	6827	3058	6243	5492	3702	2211	1023
Intermediate Adherence	2407	2202	1435	810	345	4287	3880	2729	1689	806	1506	1303	874	558	256
Low Adherence	1071	944	566	317	147	2164	1947	1325	795	384	1419	1255	856	512	238