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

<table>
<thead>
<tr>
<th>Process</th>
<th>Outcomes</th>
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<td>Mortality</td>
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<td>↓DRP</td>
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<td>↓Medication Errors</td>
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<td>↓ADE ADR</td>
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<td>↑Compliance</td>
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<td>↑Appropriateness</td>
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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
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

Structure
• Professional competencies
• Checklists, tools and information material
• Responsibilities in the team
• Clinical Pharmacist

Process
• Team approach
• Communication and information
• Follow-up on quality
• R&D

Outcome

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

Structure → Process → Outcome

Research ↔ Practice/education

Implementation
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
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!

Pain at 2 to 7 days in Acute Otitis Media

NNT: 20

CER: 14%

Key:
- Free From Harm
- Harmed By Rx
- Saved By Rx
- Not Saved By Rx

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


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

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