Appropriate use of medicines in care of the elderly

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Factors underlying inappropriateness, and impact of the clinical pharmacist

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Introduction

Optimising the use of medicines hospitals is central to the quality of patient care in hospitals.

A spoonful of sugar, NHS 2001

- Medicines can save lives. But they can harm too.
- Landmark study on adverse drug events (ADEs):
  (Bates, 1995 and 1997)
  - 6.5 ADEs / 100 hospital admissions
  - 12% life threatening, 30% serious
  - 28-42% are **preventable**
    - Annual cost for a 700-bed teaching hospital: $2.8 million

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Introduction

Optimising the use of medicines hospitals is central to the quality of patient care in hospitals.

A spoonful of sugar, NHS 2001

- How to prevent « preventable ADEs »?
  - Prescription and administration must be optimised
  - Build safety into the *systems* of care (≠ blame *individuals*)
  - « 2 of the most interesting changes (…) are computerised-physician order entry, and redefinition of the role of pharmacists to make them onsite members of the unit patient care team. » (Bates, 1995)

Introduction

- Clinical pharmacy – pharmaceutical care
  - A clinical pharmacist should aim to maximise therapeutic effect, to minimise risk, to minimise cost and to respect patient choice. (Barber, 1996)

Patient-centered services

« Ward pharmacy »

« Pharmaceutical care »

Introduction

- Clinical pharmacy : International experience
  - 35-year experience in US/Canada/UK
    - Pharmacists attend rounds in 80% of large US hospitals (Pedersen, 2005)
    - 94% of Canadian hospitals provide clinical pharmacy services (Bussières, 2001)
      - 40% of pharmacists' time devoted to clinical activities
    - 60% of hospital pharmacists in the UK provide patient counselling (Cotter, 1994)
  - Evidence of positive impact on various outcomes (Spinewine, 2003)
    - Clinical: ↓ ADEs, ↓ morbidity, ↓ mortality
    - Economic: ↓ direct and indirect costs
    - Humanistic: ↑ satisfaction

Introduction

- Clinical pharmacy: Belgian experience in 2000
  - Patient-centered services: (almost) inexistant
    (Spinewine 2003, Willems 2005)

- Hospital pharmacists' activities:
  - 70% distribution, 16% manufacturing or compounding
  - 10% other activities
- When regular ward visits:
  - 1 hour/day
  - Stock control, collecting prescriptions, solving drug-related problems

Introduction

- Clinical pharmacy: Belgian experience
  - BUT…
    - Opportunities for development:
      - National willingness to improve quality and safety, ↓ nb of doctors
    - Barriers to overcome:
      - Resources, acceptation, training

(Spinewine and Dhillon, 2002)

Main research hypothesis:

Pharmaceutical care provided to patients at high risk of drug-related problems improves the quality of use of medicines

(1) Target: frail elderly patients

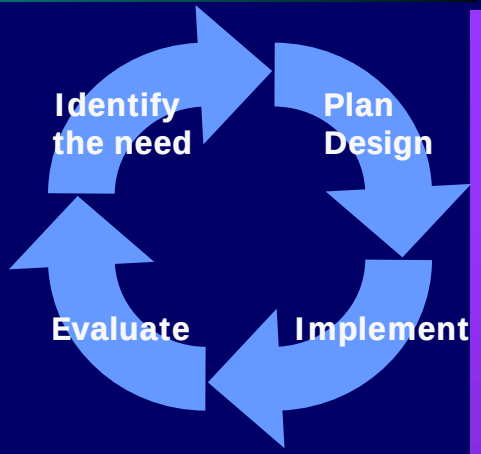
High risk of drug-related problems

Risk factors	→	Problems with drugs	→	Consequences
- Comorbidities +++ - PK/PD changes - Physical/cognitive impairment -…		- Polymedication - Inappropriate prescribing - Poor compliance - …		- *Clinical* ↑ ADEs, morbidity, mortality - *Economic* ↑ costs - *Humanistic* ↓ quality-of-life

Examples:

- 50% of admissions to hospital that are secondary to an ADE are preventable
- 50% of elderly patients do not take their drugs as intended
- 1 € spent on drugs → 1.33 € spent to treat drug-related problems (Bootman, 1997)

(2) Rigorous evaluation of impact



- Structured and logical approach

1. Assess the baseline level of appropriateness of use of medicines → needs identification
2. Design the intervention (must address the needs)
3. Implement the intervention / service
4. Evaluate impact on quality
    1. Robust study design
    2. Validated process and outcome measures

(2) Rigorous evaluation of impact

- Structured and logical approach

1. Assess the baseline level of appropriateness of use of medicines → needs identification

Qualitative research in health care

QUALITATIVE *↔ quantitative*

Approach

- often exploratory work: “how” and “why” ↔ how many?
- hypothesis generating ↔ testing

Why do inappropriate use of medicines occur?

What is the % of inappropriate prescriptions?

What is the impact of clinical pharmacists on this %?

Qualitative research in health care

QUALITATIVE	*↔ quantitative*
Approach	
often exploratory work: “how” and “why”	↔ how many?
hypothesis generating	↔ testing
Methods	
interviews, observation, documents	↔ survey, RCT
Sample	
small and purposive	↔ large, random

I. Qualitative study - objective

1a. To explore the perceptions of HCPs on the appropriateness of use of medicines for elderly inpatients

1b. To identify the processes leading to (in)appropriate use of medicines

with regard to prescribing, counselling, and transfer of information to the general practitioner

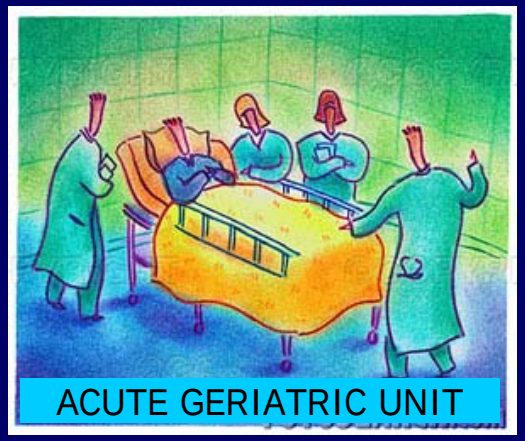
Appropriateness of use of medicines in elderly inpatients: qualitative study

Spinewine A, Swine C, Dhillon S, Dean Franklin B, Tulkens PM, Wilmotte L, Lorant V.

British Medical Journal 2005;331:935-9.

I. Qualitative study - design

1. DATA COLLECTION



5 doctors
4 nurses
3 pharmacists
} Individual interviews

17 patients
} Group interviews (focus groups)

2 acute geriatric units
} 1-month observation by clinical pharmacists

2. DATA ANALYSIS

Read transcripts → themes → coding → ...

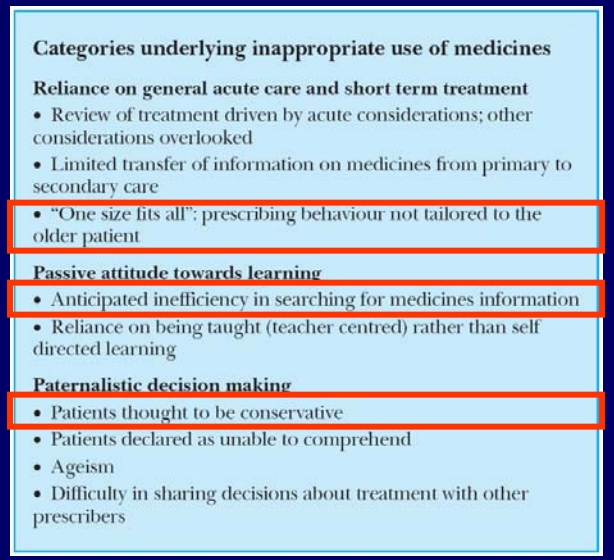
Inductive, multidisciplinary approach

Software support: QSR N-Vivo

I. Qualitative study - results

- Perceived appropriateness
  - Inappropriate prescribing does occur
  - Patient counselling is insufficient
  - Information given to the general practitioner upon discharge, and relating to medicines, is insufficient

→ Why does this occur?



Categories underlying inappropriate use of medicines

Reliance on general acute care and short term treatment

- Review of treatment driven by acute considerations; other considerations overlooked
- Limited transfer of information on medicines from primary to secondary care

1. • "One size fits all": prescribing behaviour not tailored to the older patient

Passive attitude towards learning

2. • Anticipated inefficiency in searching for medicines information
- Reliance on being taught (teacher centred) rather than self directed learning

Paternalistic decision making

3. • Patients thought to be conservative
- Patients declared as unable to comprehend
- Ageism
- Difficulty in sharing decisions about treatment with other prescribers

I. Qualitative study - results

Why does inappropriate prescribing occur?

1. Prescribing is not tailored to ELDERLY patients

> *« Doctors haven't necessarily been trained in geriatrics. They will start with 10mg of morphine every 4 hours. That's too much. »*

2. Searching for medicines information: takes too long

> *« I don't really know drug interactions very well. And to always go and look in the compendium is a bit difficult in terms of time. »*

3. Paternalism – patients are thought to be conservative

> *« Patients are attached to their medicines. It is difficult to go against that. »*

I. Qualitative study - discussion

- Underlying factors → approaches for improvement
- Support by a clinical pharmacist could tackle several of the underlying factors

Figure 1: Pharmaceutical care process used in the study

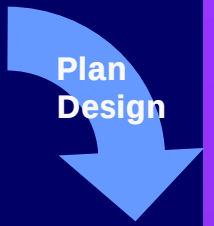
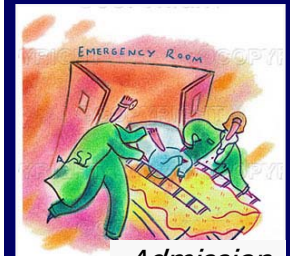


Figure 1: Pharmaceutical care process used in the study

Step 1: Gathering relevant information on the patient on admission

Medication history ⟷

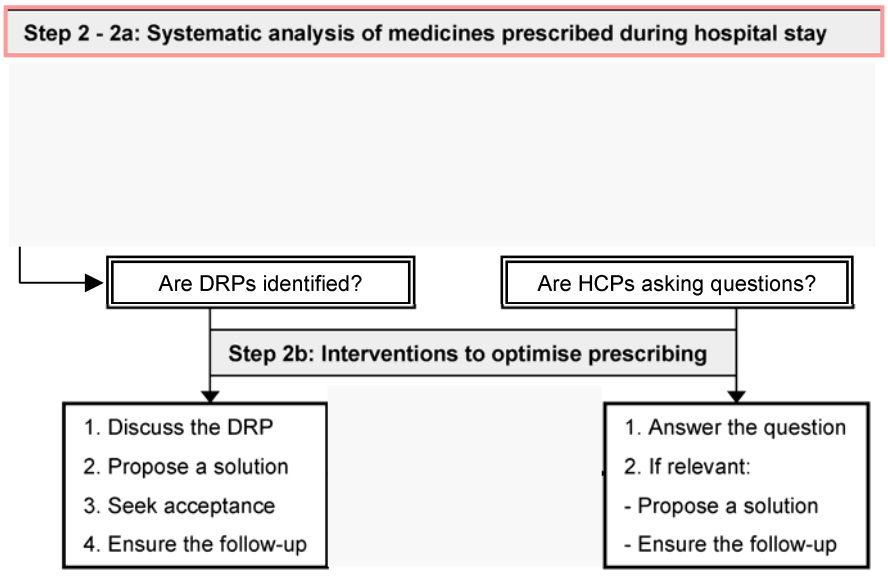
- Patient / caregiver
- General practitioner
- Community pharmacist



Admission

Plan
Design

Figure 1: Pharmaceutical care process used in the study



Plan
Design

Hospital stay

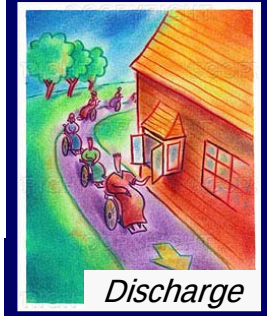
Figure 1: Pharmaceutical care process used in the study

Plan
Design

Step 3: Information at discharge

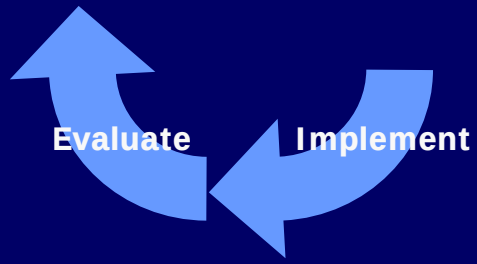
Counselling → Patient and/or caregiver

→ General practitioner



Abbreviations: DRP: drug-related problem; EBM: evidence-based medicine; HCP: health care professional; SPC: summary of product characteristics.
Grey dotted boxes represent persons with whom the clinical pharmacist collaborated.

III. Implementation and evaluation



Objectives

3a. To evaluate the feasibility to provide pharmaceutical care

3b. To evaluate the impact on the quality of use of medicines

Acute geriatric unit, Mont-Godinne teaching hospital, 7 months

Implementation of ward-based clinical pharmacy services in Belgium – Description of the impact on a geriatric unit.

Spinewine A, Dhillon S, Mallet L, Tulkens PM, Wilmotte L, Swine C.

Annals of Pharmacotherapy 2006;40:720-8.

Impact of a collaborative approach on the quality of prescribing for geriatric inpatients. A randomized controlled trial.

Spinewine A, Swine C, Dhillon S, Lambert P, Nachega J, Wilmotte L, Tulkens PM.

Journal of the American Geriatrics Society 2007; 55:658–665

How to evaluate the impact of pharmaceutical care?

- Descriptive approach
  - Description of interventions made by the clinical pharmacist to optimise the use of medicines

- Comparative approach
  - Comparison with a control group
  - Measures of impact

III. Evaluation – descriptive study

- 101 patients
- 82.2 ± 6.9 years
- 7.8 ± 3.5 prescribed drugs

Mean nb of interventions per patient

Initiated by:

- The pharmacist: 8.9 ± 6.0
- Another professional: 1.6 ± 1.6

Most frequent recommendations:

• Discontinue medicine	24.5%
• Add a new drug	18.6%
• Change dose	12.5%
• Educate HCP	10.0%
• Switch to other drug	8.9%

Acceptation

• Fully accepted	88%
• Partially accepted	7%
• Rejected	5%

III. Evaluation – descriptive study

Clinical significance (n=700) :

- Moderate 68.3%
- Major 28.6%
- Minor 2.6%

⇒ 5 « moderate » interventions per patient

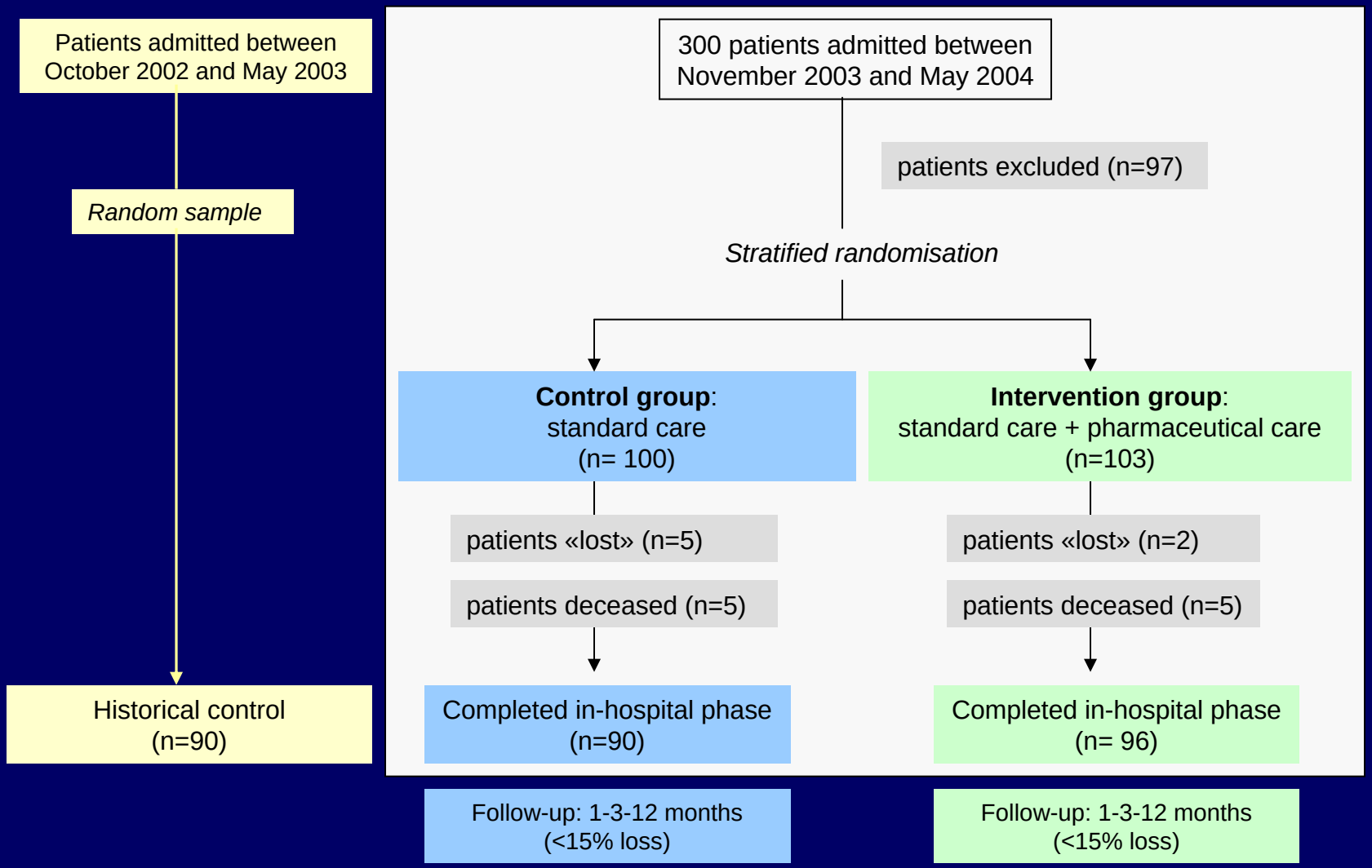
⇒ 2 « major » interventions per patient

How to evaluate the impact of pharmaceutical care?

- Descriptive approach
  - Description of interventions made by the clinical pharmacist to optimise the use of medicines

- Comparative approach
  - Comparison with a control group
  - Measures of impact
    - « Process » measures : quality measures
      - Appropriateness of prescribing
    - « Outcome » measures
      - Clinical: ADE, length of stay, mortality, readmission
      - Economic: cost of drugs, cost of hospital stay,…
      - Humanistic: quality-of-life, satisfaction

III. Evaluation – RCT – design



III. Evaluation – RCT – design

- Descriptive approach
  - Description of interventions made by the clinical pharmacist to optimise the use of medicines

- Comparative approach
  - Comparison with a control group
  - Measures of impact
    - « Process » measures : quality measures
      - Appropriateness of prescribing (on admission and at discharge)
    - « Outcome » measures
      - Clinical: ADE, length of stay, mortality, readmission
      - Economic: cost of drugs, cost of hospital stay,…
      - Humanistic: quality-of-life, satisfaction

1°

How to measure appropriateness of prescribing in older patients?

1. Medication Appropriateness Index (MAI)

% of patients with ≥1 inappropriate rating?

1. Valid indication?
2. Appropriate choice?
3. Correct dose?
4. Modalities of treatment correct?
5. Modalities of treatment practical?
6. Clin. significant drug-drug interactions?
7. Clin. significant drug-disease interactions?
8. Duplication?
9. Appropriate duration?
10. Cost?

Spinewine et al., Lancet 2007;370:173-84

How to measure appropriateness of prescribing in older patients?

1. Medication Appropriateness Index (MAI)

% of patients with ≥1 inappropriate rating?

2. Drug-to-avoid criteria (Beers)

e.g. long-acting BZD, amitriptyline, dipyridamole

% of patients taking ≥1 Beers' drug?

% of patients with previous fall and taking a BZD?

Spinewine et al., Lancet 2007;370:173-84

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% of patients taking ≥1 Beers' drug?

% of patient with previous fall and taking a BZD?

3. Underuse ACOVE criteria

e.g. patient with myocardial infarction and not on aspirin
e.g. patient with osteoporosis and not treated

% of patients with ≥1 underuse event ?

Spinewine et al., Lancet 2007;370:173-84

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1. Medication Appropriateness Index (MAI)

   % of patients with ≥1 inappropriate rating?

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   % of patients taking ≥1 Beers' drug?

   % of patient with previous fall and taking a BZD?

3. Underuse ACOVE criteria

   % of patients with ≥1 underuse event ?

ON ADMISSION

versus

AT DISCHARGE

III. Evaluation – RCT – results

ON ADMISSION

1. Medication Appropriateness Index (MAI)

% of patients with ≥1 inappropriate rating?

20% --- 84%

Dupli Dose

2. Drug-to-avoid criteria (Beers)

% of patients taking ≥1 Beers' drug?

30%

% of patient with previous fall and taking a BZD?

62%

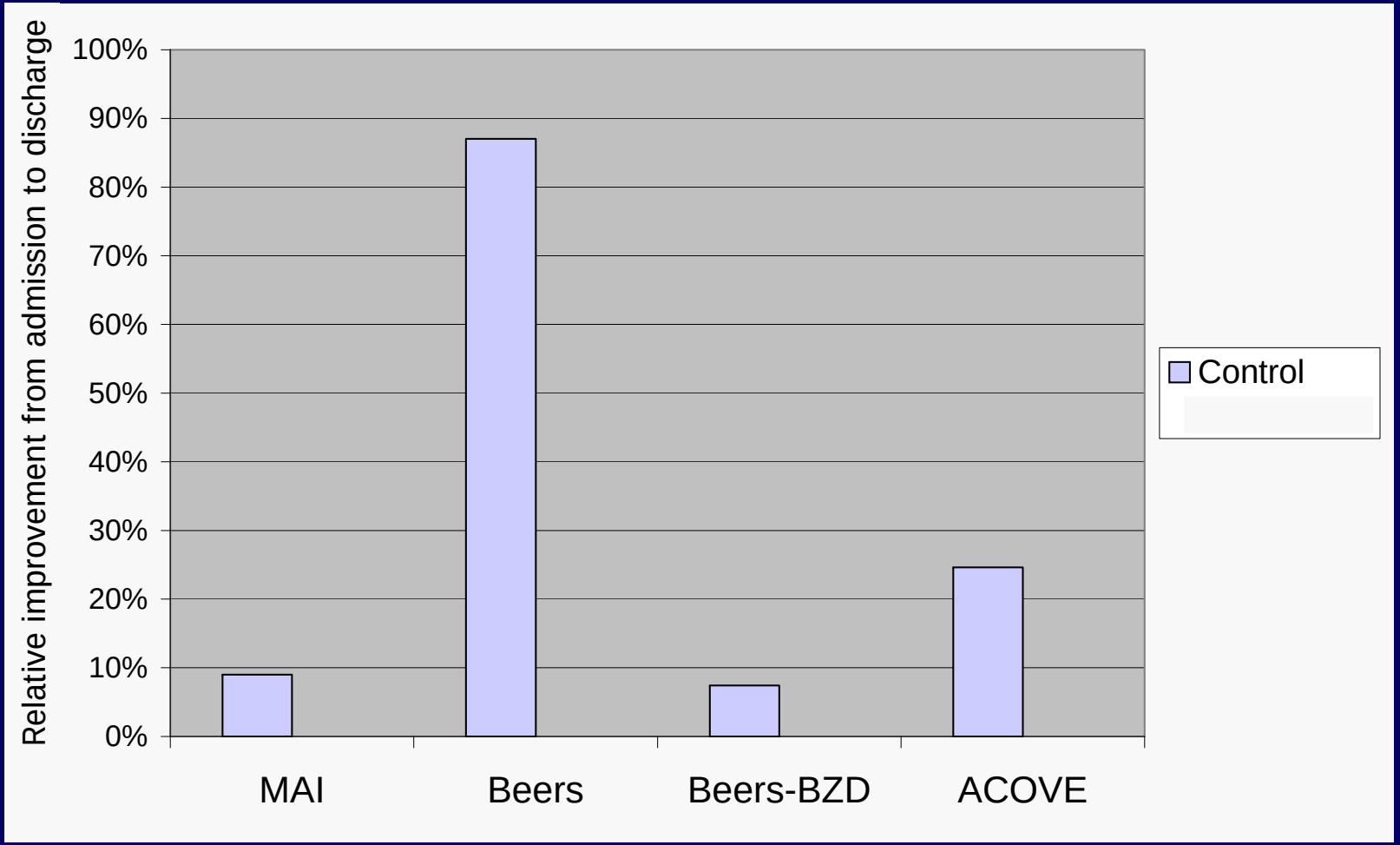
3. Underuse ACOVE criteria

% of patients with ≥1 underuse event ?

55%

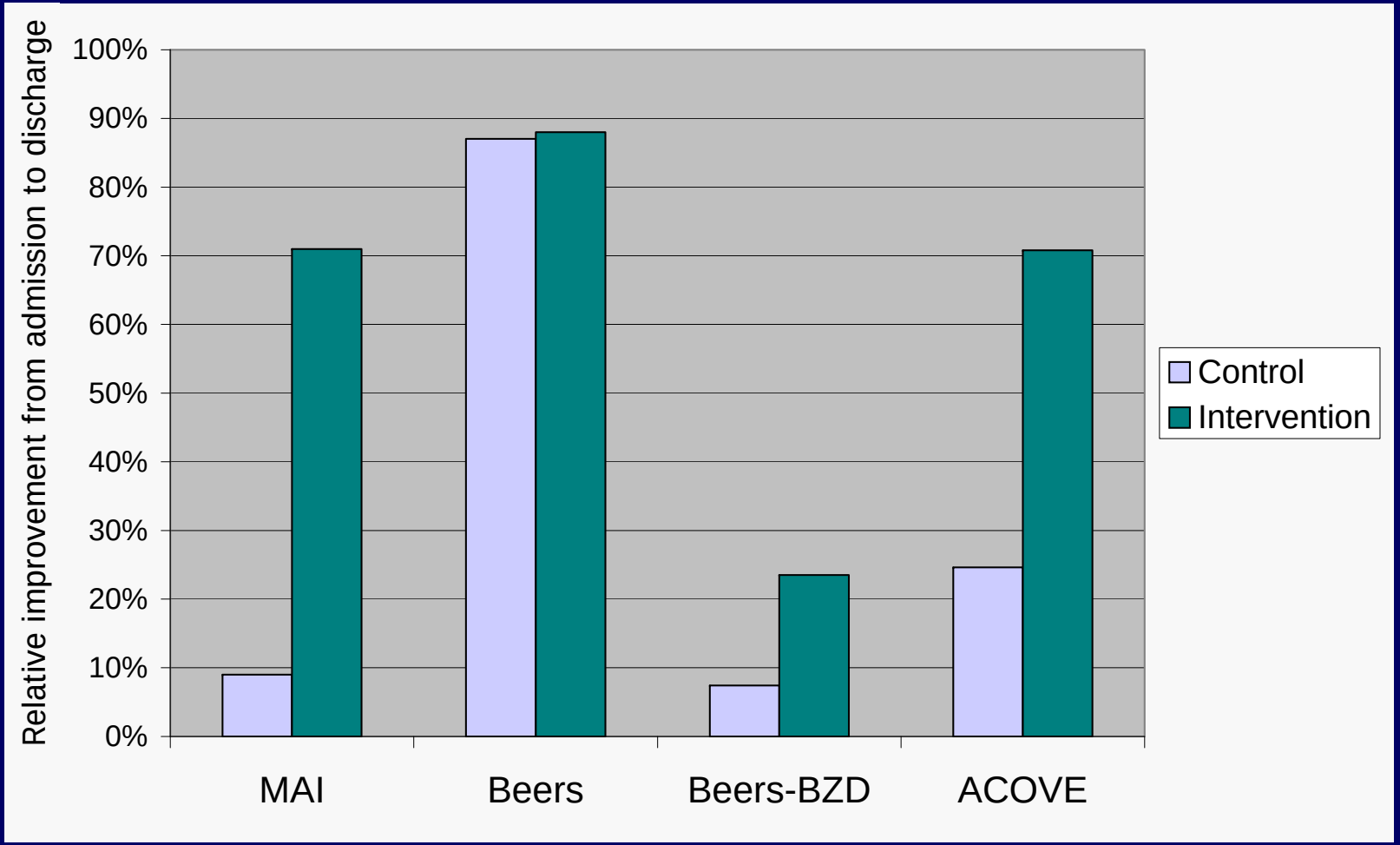
III. Evaluation – RCT – results

IMPROVEMENTS FROM ADMISSION TO DISCHARGE



III. Evaluation – RCT – results

IMPROVEMENTS FROM ADMISSION TO DISCHARGE



III. Evaluation – RCT – results

- Descriptive study
  - Description of interventions made by the clinical pharmacist to optimise the use of medicines

- Comparative study
  - Comparison with a control group
  - Measures of impact
    - « Process » measures
      - Appropriateness of prescribing – maintenance of improvements after discharge

2°

    - « Outcome » measures
      - Clinical: ADE, length of stay, mortality, readmission
      - Economic: cost of drugs, cost of hospital stay,…
      - Humanistic: quality-of-life, satisfaction

III. Evaluation – discussion

- Moderate/high levels of inappropriate prescribing at baseline
- Impact of pharmaceutical care:

  At the prescriber level:
  - Improvement in the quality of medicines use
  - Persistance after discharge
  - Possible educational bias

  At the patient level:
  - Increased satisfaction with information received on medicines
  - Impact on clinical outcomes? Sample too small

- Relative impact compared to other approaches for optimisation?
  - Comparison with computerised prescribing

Discussion – What have we learned?

- Need to optimise use of medicines in the elderly
- Several categories of causal factors need to be addressed

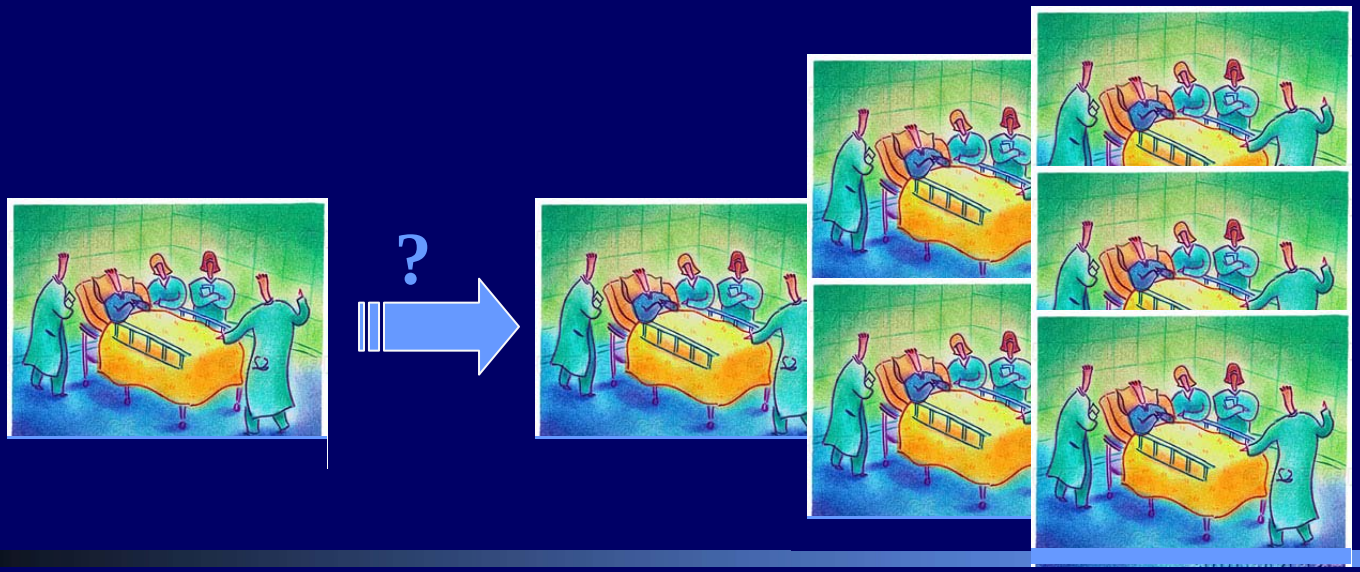
- Providing pharmaceutical care
  - is feasible and well accepted
  - improves the quality of use of medicines
  - cannot be replaced by a computerised prescr. system

- New European data on inappropriate prescribing
- 1st time qualitative approach taken
- MAI, reliability: new findings
- New and robust data on impact in acute geriatrics
- Of interest for implementation in other European countries

Perspectives

Clinical pharmacy in Belgium – What's next?

1. Generalisabity of our results
   - to other hospitals, units, pharmacists
   - ongoing pilot studies; new positions created (Ampe, 2006)
   - Perspective: use similar tools to evaluate impact; design a multicenter study

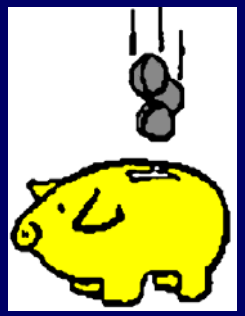


Perspectives

Clinical pharmacy in Belgium – What's next?

1. Generalisabity of our results
   - to other hospitals, units, pharmacists
   - ongoing pilot studies; new positions created (Ampe, 2006)
   - Perspective: use similar tools to evaluate impact; design a multicenter study

2. Economic impact ???
   - Impact on direct v. indirect costs
   - Litterature: mean benefit:cost ratio = 4.68:1 (Schumock, 2003)
   - Belgian data are essential for successful expansion
   - Perspective: evaluate impact in the context of the new prospective budgeting system



Perspectives

Final thoughts for the future

- The needs differ between units and patients –
  Always adapt the service to the needs, and prioritise.

- Essential components of success: clinical pharmacists must have:
  - Direct contacts with patients and HCPs
  - Access to patient records
  - A structured approach to treatment review and optimisation
  - Adequate knowledge and skills → current efforts to develop specific educational programs should be pursued and extended.

- Articulate pharmaceutical care services with decentralised clinical pharmacy services (eg guideline development, computerised prescribing)

Collaborators

- UCL
  - Acute geriatric unit, Mont-Godinne Hospital
  - Vincent Lorant, SESA
  - CUMG (JM Feron, D Paulus,…)
  - Statistics department, LLN
- External collaborators
  - UK: S Dhillon, B Dean, N Barber (School of Pharmacy, London)
  - Canada: Louise Mallet
  - FNRS