The added value of pharmacists in the care of frail older patients

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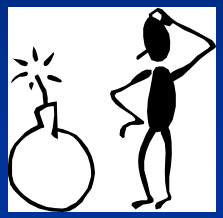
Use of drugs in older patients: essential but risky



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

- 10-30% of hospital admissions are directly related to drug-related problems
- ADEs are documented in 5-35% of patients in the community
- 32-69% of ADEs are possibly preventable

Approches for optimisation

- Educational approaches
- Medication reviews
- Multidisciplinary team interventions
- Geriatric evaluation and management teams
- Computerised decision support system
- Regulation
- …

Pharmacists can be involved, sometimes in a highly proactive way

Kaur S et al., 2009; Marcum ZA et al., 2010; Forsetlund L et al., 2011; Loganathan M et al., 2011; Patterson SM et al., 2012

Objectives of this talk

- To explain the different models of care in which pharmacists can be involved
- To review the evidence on the impact of pharmacists' involvement in nursing home care, ambulatory care and hospital care
  - Focus: prescribing – recent European studies (RCTs)
- To highlight key success factors

Largely inspired from: Spinewine A, Fialova D, Byrne S. The role of the pharmacist in optimizing pharmacotherapy in older people. Drugs Aging 2012;29:495-510

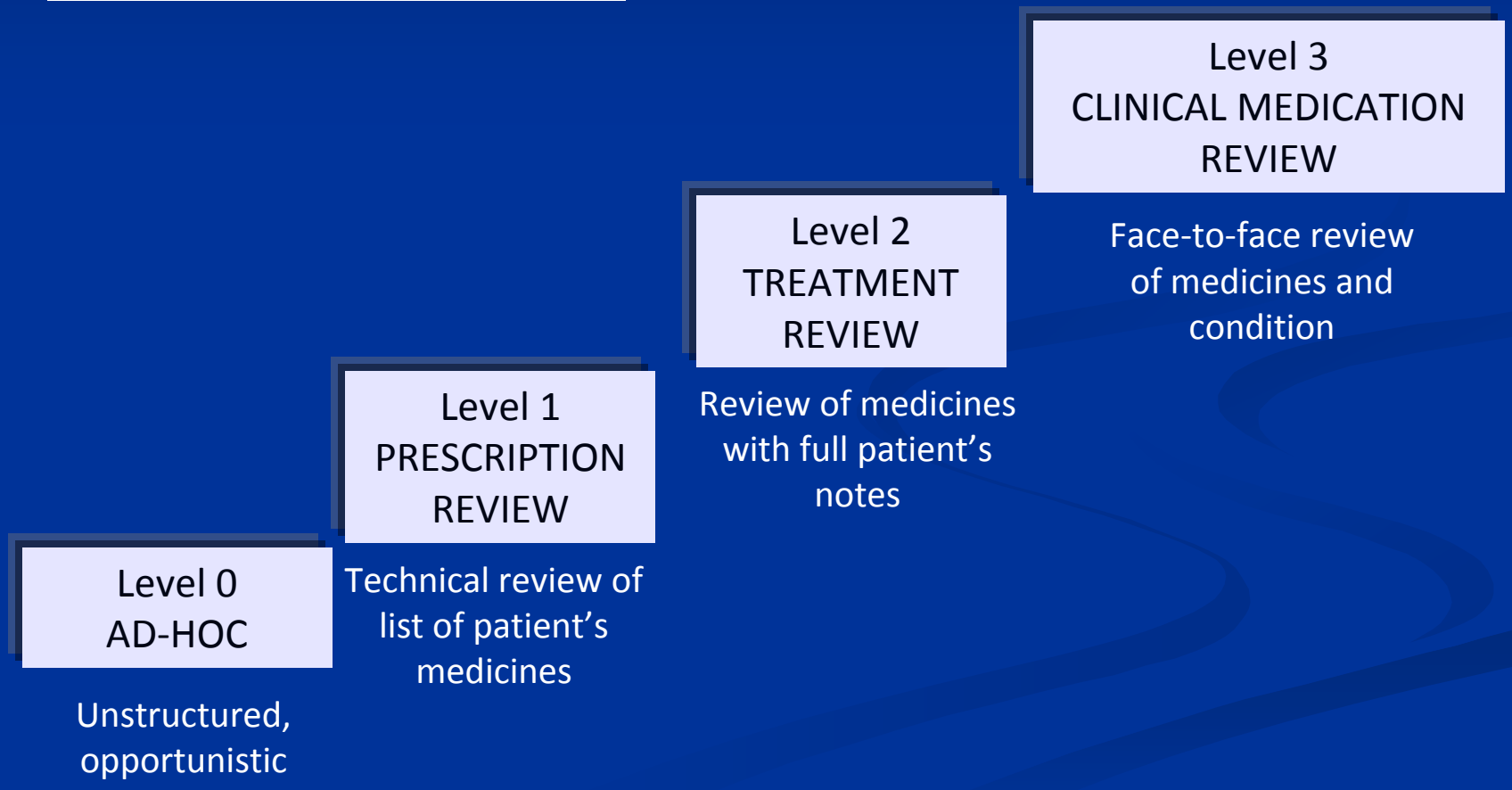
What are we talking about?

- Pharmaceutical care (clinical pharmacy)
  - A process by which a pharmacist liaises with a patient and/or HCP to optimize pharmacotherapy
  - By designing, implementing and monitoring therapeutic goals that will produce specific therapeutic outcome for patients
  - Identification, resolution and prevention of drug-related problems
  - **Patient-centered approach**

Hepler C and Strand L., 1990

What are we talking about?

- Medication review



What are we talking about?

- Medication review
  - *« A review performed by a HCP,*
  - *taking into consideration a patient's health status and medications,*
  - *with access to full medical and care records,*
  - *in conjunction with a consultation with the patient and their carer. »*

1. Pharmacists in nursing hom

- Models of care
  - Regular medication review; can vary :
    - From: « 1-way » approach
    - To: « team approach »
  - Educational role
    - → physicians, nurses, patients
  - Psychoactive medications = frequent focus
    - High rate of prescribing (chemical restraints?) and ADEs

- Pharmacist-led medication review
  - Zermansky et al., 2006

RCT with 661 residents, 65 NHs, UK

- Medication review + consultations with patient/carer
- Written recommendations forwarded to GP

- Acceptance rate: 76%
- 3.1 vs 2.4 changes in medications (p<.0001)

- ↓ in nb of falls
- No ≠ in drug costs or hospital admission

Table 2. Pharmacist recommendations and outcome by drug

Recommendation	Number	%
Technical	225	30.1
Test required	161	21.6
Stop medicine	100	13.4
Alter medicine	91	4.0
Switch	37	
Alter dose	40	
Alter formulation	12	
Alter timing	2	
Referred to GP to resolve	10	0.4
Rectify record mismatch	9	0.4
Start medicine	76	10.2
Non-medicine-related intervention	75	10.1
Total	747	100

- Pharmacist-led medication review discussed with the multidisciplinary team

Halvorsen et al., 2010	Brulhart and Vermeille, 2011
Descriptive study 142 patients in 3 NHs, Norway	Descriptive study 329 patients in 10 NHs, Switzerland
- Medication reviews by pharmacists → DRPs discussed during case conferences with medical and nursing staff	
- 504 DRPs - Acceptance rate: 94%	- 1225 DRPs - Acceptance rate: 93%

Pharmacist-led medication review + effective communication with other HCPs → high uptake of recommendations

The Fleetwood model of pharmaceutical care

- American Society of Consultant Pharmacists
- Major components
  - Regular medication review for high risk patients
  - Direct communication with prescriber (multi team)
  - Formalised pharmaceutical care plan documented
- Evidence of improvements in appropriate use of medicines in the US
- Applicability to Europe?

?

The Fleetwood model of pharmaceutical care

- Applicable to UK?
  - Preliminary study (Patterson SM et al., 2007)
    - Why not… would be good but…
    - Major challenges: access to records, patients, prescribers
    - → US model refined

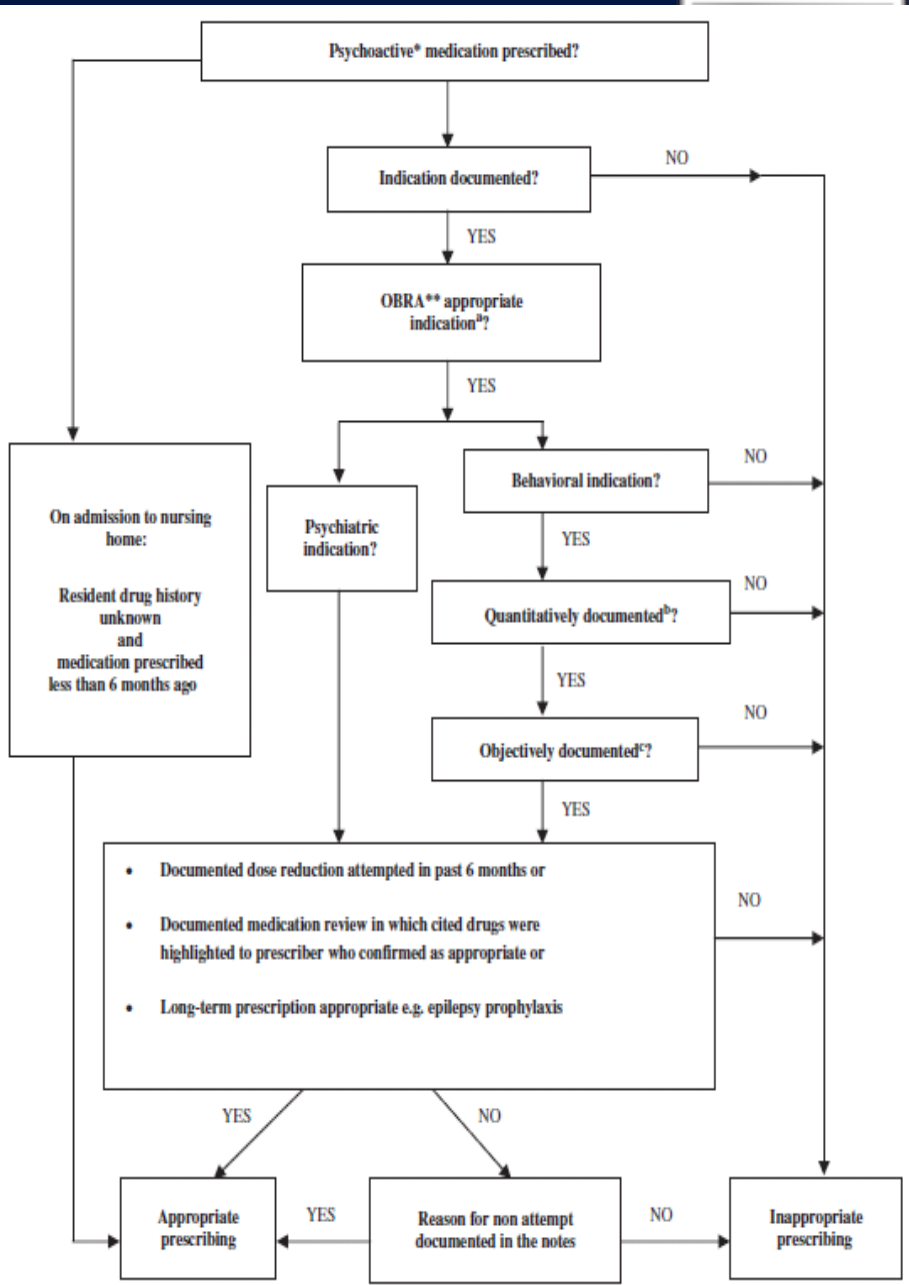
The Fleetwood model of ph

- Applicable to UK?

Patterson et al., 2010 & 2011

Cluster RCT, 334 residents, 22 NHs (11
Northern Ireland

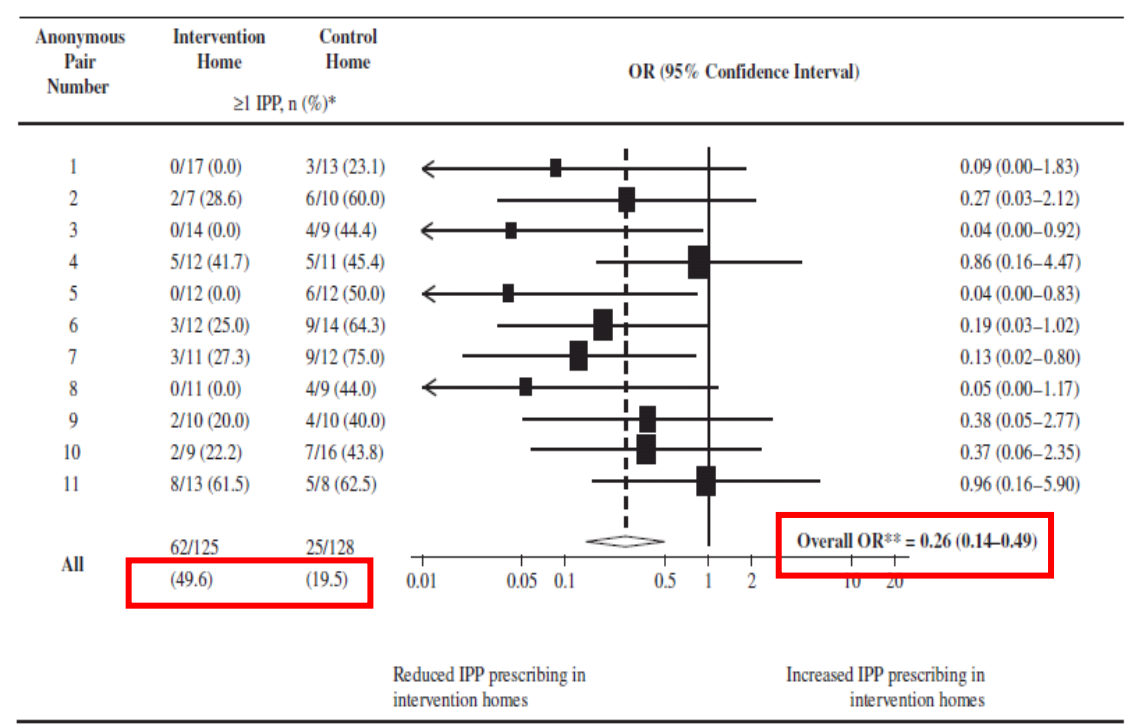
- Main focus: psychoactive agents (anx
- 9 trained pharmacists
- Components:
  - Monthly visits
  - Algorithm to evaluate treatr
  - Liaison with GPs and other H
  - Documentation on pharmac



Nursing home care

THE FLEETWOOD PROJECT
DEMONSTRATING THE VALUE OF CONSULTANT PHARMACISTS

Primary outcome measure: change in proportion of residents receiving inappropriate psychoactive drugs



Anonymous Pair Number	Intervention Home ≥1 IPP, n (%)*	Control Home ≥1 IPP, n (%)*	OR (95% Confidence Interval)
1	0/17 (0.0)	3/13 (23.1)	0.09 (0.00–1.83)
2	2/7 (28.6)	6/10 (60.0)	0.27 (0.03–2.12)
3	0/14 (0.0)	4/9 (44.4)	0.04 (0.00–0.92)
4	5/12 (41.7)	5/11 (45.4)	0.86 (0.16–4.47)
5	0/12 (0.0)	6/12 (50.0)	0.04 (0.00–0.83)
6	3/12 (25.0)	9/14 (64.3)	0.19 (0.03–1.02)
7	3/11 (27.3)	9/12 (75.0)	0.13 (0.02–0.80)
8	0/11 (0.0)	4/9 (44.0)	0.05 (0.00–1.17)
9	2/10 (20.0)	4/10 (40.0)	0.38 (0.05–2.77)
10	2/9 (22.2)	7/16 (43.8)	0.37 (0.06–2.35)
11	8/13 (61.5)	5/8 (62.5)	0.96 (0.16–5.90)
All	62/125 (49.6)	25/128 (19.5)	Overall OR** = 0.26 (0.14–0.49)

* Inappropriate psychoactive medication (IPP; hypnotic, anxiolytic, antipsychotic).
**Heterogeneity: chi-square=9.32, P=.50.
OR=odds ratio.

Figure 3. Effect of the adopted Fleetwood Model on the proportion of residents receiving an inappropriate psychoactive medication in the intervention and control nursing homes at 12 months

No ≠ in falls rate

The Fleetwood model of pharmaceutical care

- Pharmacoeconomic analysis

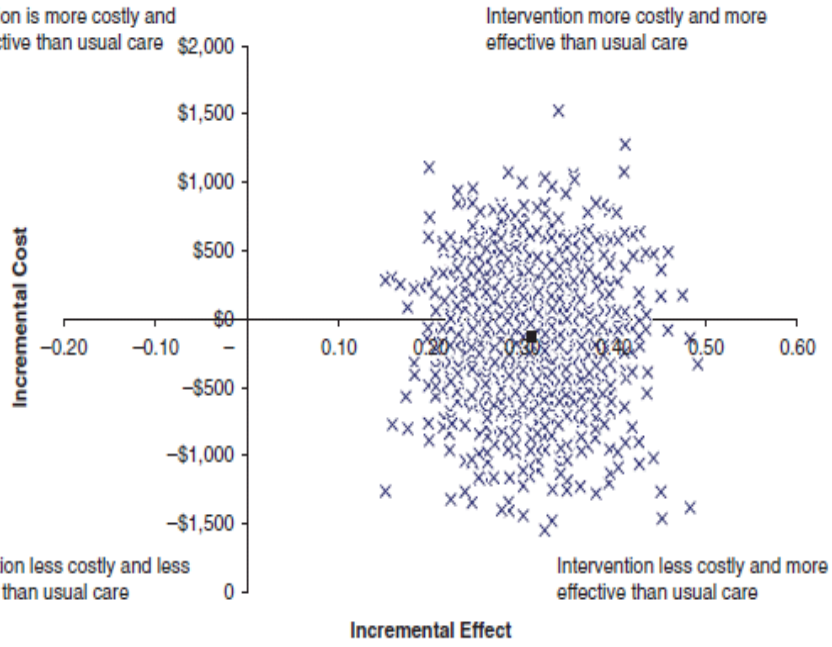
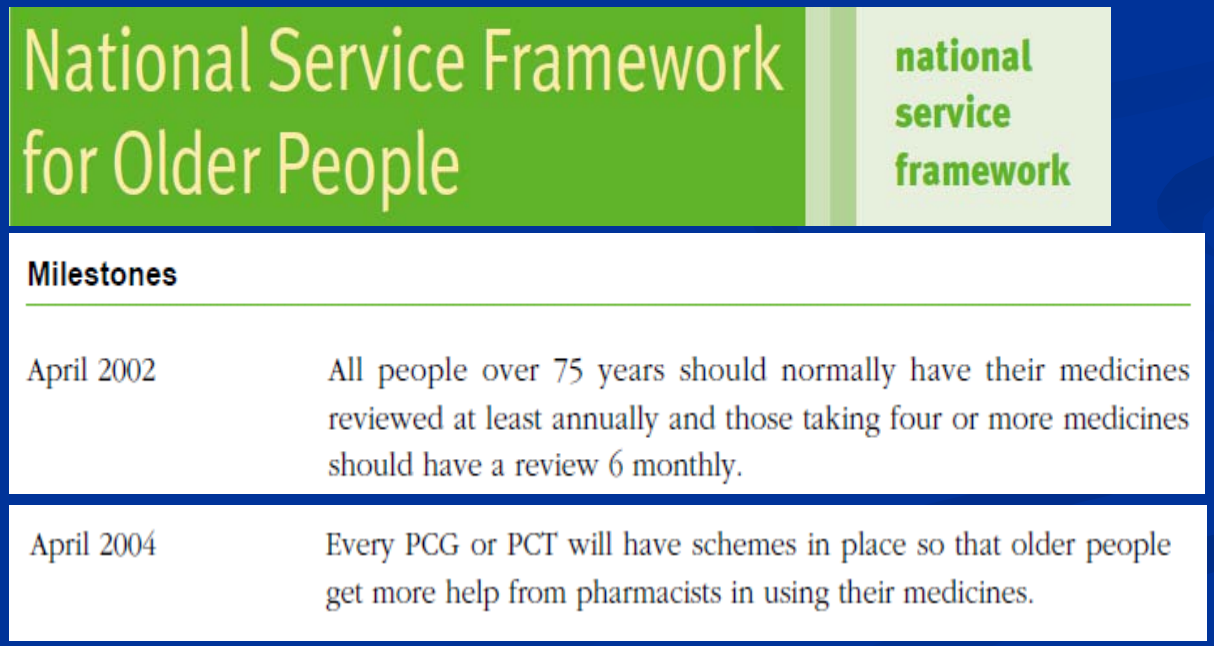


Figure 1. Cost-effectiveness plane for residents alive at 12 months. The scatter graph shows the mean difference in costs and in the proportion of nursing home residents receiving one or more inappropriately prescribed psychoactive medications.

2. Pharmacists in ambulatory care

- Pharmaceutical care specifically mandated or encouraged in several countries
  - US, UK, Australia, Netherlands,…



National Service Framework for Older People

national service framework

Milestones	
April 2002	All people over 75 years should normally have their medicines reviewed at least annually and those taking four or more medicines should have a review 6 monthly.
April 2004	Every PCG or PCT will have schemes in place so that older people get more help from pharmacists in using their medicines.

2. Pharmacists in ambulatory care

- Models of care
  - Pharmaceutical care provided by community pharmacists
  - Home-based medication reviews
  - Pharmaceutical care within a primary care team

Community pharmacy setting

PEER study (Bernsten et al., 2001)

RCT, 2454 patients, ≥65y, ≥5meds
190 pharmacies, 7 Europ countries

Pharmaceutical care by community pharmacists
Education, compliance, medication review, follow-up

- No ≠ in knowledge, compliance, nb meds, changes
- Heterogeneity across countries

- No ≠ in hospital admissions, cost, variable effect on HRQOL

Challenges and limitations!

- Access to patient data, contact with GPs,…
→ Pharmacists too detached from other HCPs
- Training of pharmacists (too) limited

- Community pharmacy setting

Denneboom et al., 2007

Cluster RCT, 738 patients, ≥75y, ≥5meds
28 pharmacies, 77 GPs, the Netherlands

Treatment review using pharmacy record and computerised screening tools

Recommendations to GPs via written report

Recommendations discussed during case conferences

- More medication changes accepted by GP at baseline / 6 mo when case conferences (p.02)

- Higher costs covered by slightly greater savings

Home-based medication review (HMR)

HOMER trial (Holland et al., 2005)

RCT, 872 patients, ≥80y, discharged from hospital, ≥2meds, UK

Home-based medication review at wk 2 and 8
Adherence, education, ADR report to GP,…

- ↑ rate of hospital admission (HR 1.30 95%CI 1.07-1.58)
- No ≠ in QOL or death

What this study adds

Home based medication review by pharmacists may increase hospital admissions

More effective forms of medication review need to be established, considering patients' quality of life and effects on both hospital and general practice, as well as prescribing outcomes

- Increased help-seeking behavior?
- Better and dangerous adherence in intervention group?

- No access to full patient data!
- No face-to-face contact with GP

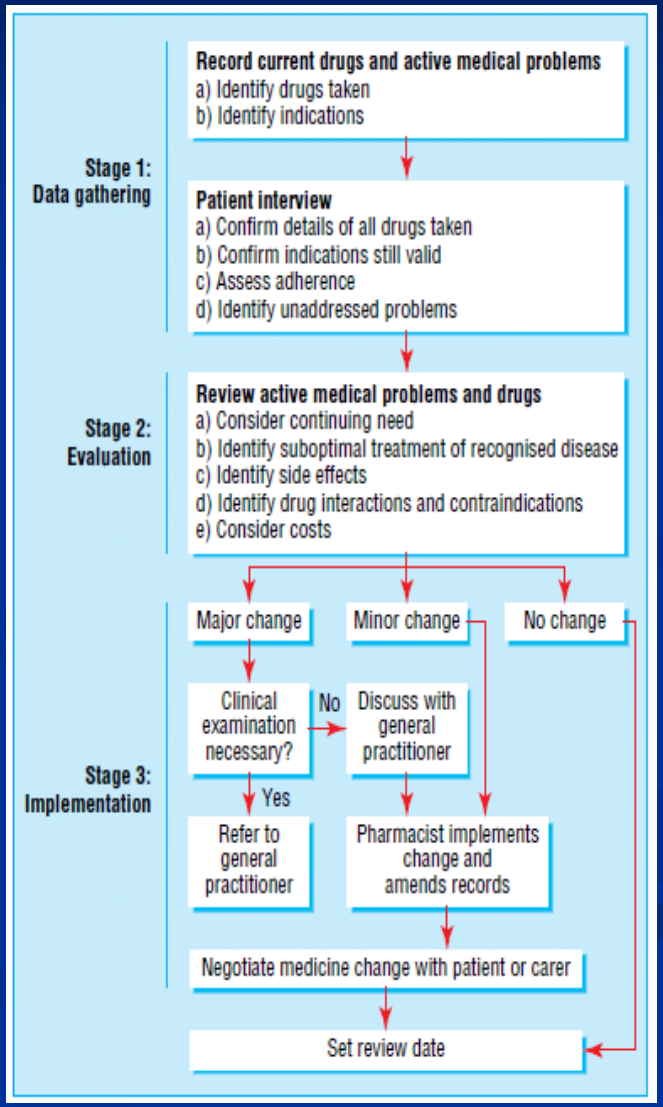
→ Pharmacists too detached from other HCPs

Clinic-based medication review

Zermansky et al., 2001

RCT, 1188 patients, ≥65y, taking ≥1 repeat med, 4 general practices, UK

Clinical medication review
Specifically trained pharmacist
Close collaboration with GPs



Clinic-based medication review

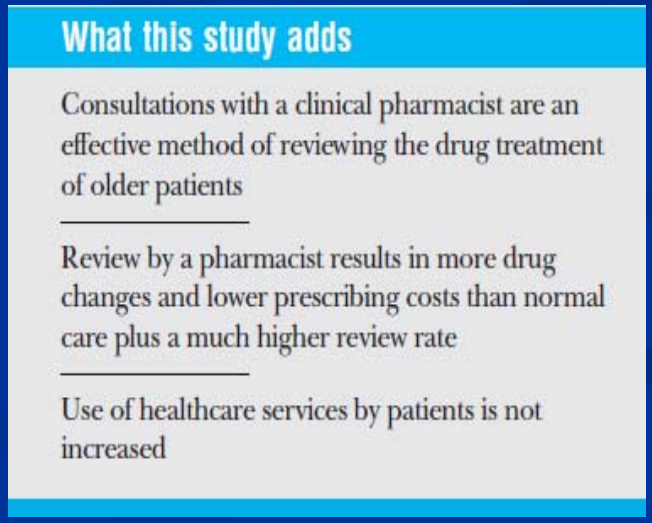
Zermansky et al., 2001

RCT, 1188 patients, ≥65y, taking ≥1 repeat med, 4 general practices, UK

Clinical medication review
Specifically trained pharmacist
Close collaboration with GPs

- More changes in drug regimen (p=.02)

- Reducation in net cost of drugs per patient per 28 days
- No ≠ in hospital admissions, mortality, outpatient consultations



What this study adds

Consultations with a clinical pharmacist are an effective method of reviewing the drug treatment of older patients

Review by a pharmacist results in more drug changes and lower prescribing costs than normal care plus a much higher review rate

Use of healthcare services by patients is not increased

3. Pharmacists in acute care

- Model of care
  - Medication history on admission
  - Medication review and individualised patient counselling during hospital stay
  - Discharge information/education for patients /HCPs
  - (follow-up telephone calls)

Hospital care

Spinewine et al., 2007	Gillespie et al., 2009
RCT, 203 patients, one acute geriatric unit, Belgium	RCT, 400 patients ≥80y, 2 internal medicine wards, Sweden
Pharmaceutical care from admission to discharge	Pharmaceutical care from admission to discharge(+ after)
- ↑ appropriateness of prescribing (MAI, ACOVE) - 90% acceptance rate	- 16% ↓ hospital visits - 46% ↓ ED visits - 80% ↓ drug-related readmissions
- Trend toward ↓ mortality and ED visits	

Table 1. Characteristics of Interventions (N = 1066) Made by the Clinical Pharmacist

Drug-Related Problem	Interventions, n (%)	Drugs Most Often Involved
Underuse	169 (15.9)	calcium/vitamin D, antithrombotics, analgesics
Wrong dose	127 (11.9)	antibiotics, psycholeptics,[a] psychoanaleptics,[a] ACE inhibitors, ARAs
Inappropriate duration of therapy	103 (9.7)	psycholeptics, heparins, antiasthmatics, antibiotics
Inappropriate choice of medicine	102 (9.6)	psycholeptics, psychoanaleptics, analgesics
No valid indication	74 (6.9)	antithrombotics, antacids, antiulcer drugs
No specific problem[b]	72 (6.8)	psychoanaleptics, psycholeptics, ACE inhibitors, ARAs, hypolipemics
Inappropriate modalities of administration[c]	65 (6.1)	analgesics, antibiotics, psychoanaleptics, antiasthmatics
Adverse drug reaction[d] suspected or confirmed	57 (5.3)	psychoanaleptics, diuretics, analgesics
Error in medication history	55 (5.2)	psychoanaleptics
Inappropriate follow-up	41 (3.8)	antianemics, cardiac therapy (digoxin)
Prescription writing error	36 (3.4)	psycholeptics
Drug–disease interaction (including allergy)	35 (3.3)	β-blockers, ACE inhibitors, ARAs, bisphosphonates, psychoanaleptics
Duplication	34 (3.2)	psycholeptics, antiasthmatics
Less costly alternative	32 (3.0)	miscellaneous
Modalities of administration not practical for the patient	26 (2.4)	miscellaneous
Drug–drug interaction	24 (2.3)	antithrombotics
Other	14 (1.3)	miscellaneous

Spinewine et al., 2007

Table 2. Summary of Outcomes at 12 Months' Follow-up

Variable[a]	Value (Quotient)		Estimate (95% Confidence Interval)
	Intervention Group (n=182)	Control Group (n=186)	
Visits to the hospital[b]	**266** (1.88)	**316** (2.24)	0.84 (0.72-0.99)
Patients readmitted[c]	106 (58.2)	110 (59.1)	0.96 (0.64-1.46)
Readmissions	217 (1.54)	223 (1.58)	0.97 (0.81-1.17)
Drug-related readmissions	9 (0.06)	45 (0.32)	0.20 (0.10-(
Visits to the emergency department	49 (0.35)	93 (0.66)	0.53 (0.37-(
Overall survival[d]	0.69	0.67	0.94 (0.65-1

Gillespie et al., 2009

Table 3. Drug-Related Readmissions

Drug-Related Cause for Readmission	Intervention Group (n=9)	Control Group (n=45)
Digoxin intoxication	1	3
Overprescribing of antihypertensive agents	1	8
Suboptimal drug therapy		
Heart failure	0	5
Ischemic heart disease	0	2
Diabetes mellitus	3	2
Dehydration due to overprescribing of diuretics	3	5
Anemia due to aspirin or nonsteroidal anti-inflammatory drugs	0	4
Confusion and/or fall due to sedatives, opioids, or anticholinergic drugs	1	9
Diarrhea due to antibiotic treatment	0	2
Hyperkalemia	0	1
Hyponatremia due to diuretics and selective serotonin reuptake inhibitor therapy	0	2
Lack of drug treatment for atrial fibrillation (embolism)	0	1
Bleeding (hematoma) due to warfarin sodium	0	1

Hospital care

Spinewine et al., 2007	Gillespie et al., 2009	Lisby et al., 2010
RCT, 203 patients, one acute geriatric unit, Belgium	RCT, 400 patients ≥80y, 2 internal medicine wards, Sweden	RCT, 100 patients ≥75y, one acute internal medicine ward, Denmark
Pharmaceutical care from admission to discharge	Pharmaceutical care from admission to discharge(+ after)	Medication history and treatment discussion with clinical pharmacologist
- ↑ appropriateness of prescribing (MAI, ACOVE) - 90% acceptance rate	- 16% ↓ hospital visits - 46% ↓ ED visits - 80% ↓ drug-related readmissions	- <50% acceptance rate
- Trend toward ↓ mortality and ED visits		- No ≠ in LOS, readmission, QOL

Summary: evidence for impact?

- Good evidence that collaboration with pharmacists can decrease the risk of drug-related problems

- Mixed / lacking evidence for effect on:
  - Clinical outcomes
    - ? Wrong measures selected? Too multifactorial?
  - HRQOL
  - Cost effectiveness

Summary: evidence for impact?

- Heterogeneity
  - Content, 'intensity' and duration of interventions
  - Background practice
  - Culture
    - ≠ countries or settings → ≠ challenges
  - …

Summary: Key success factors

- Knowledge and skills

Perspective: Is Pharmacy Ready for the Baby Boomers?

Joseph T. Hanlon, PharmD, MS

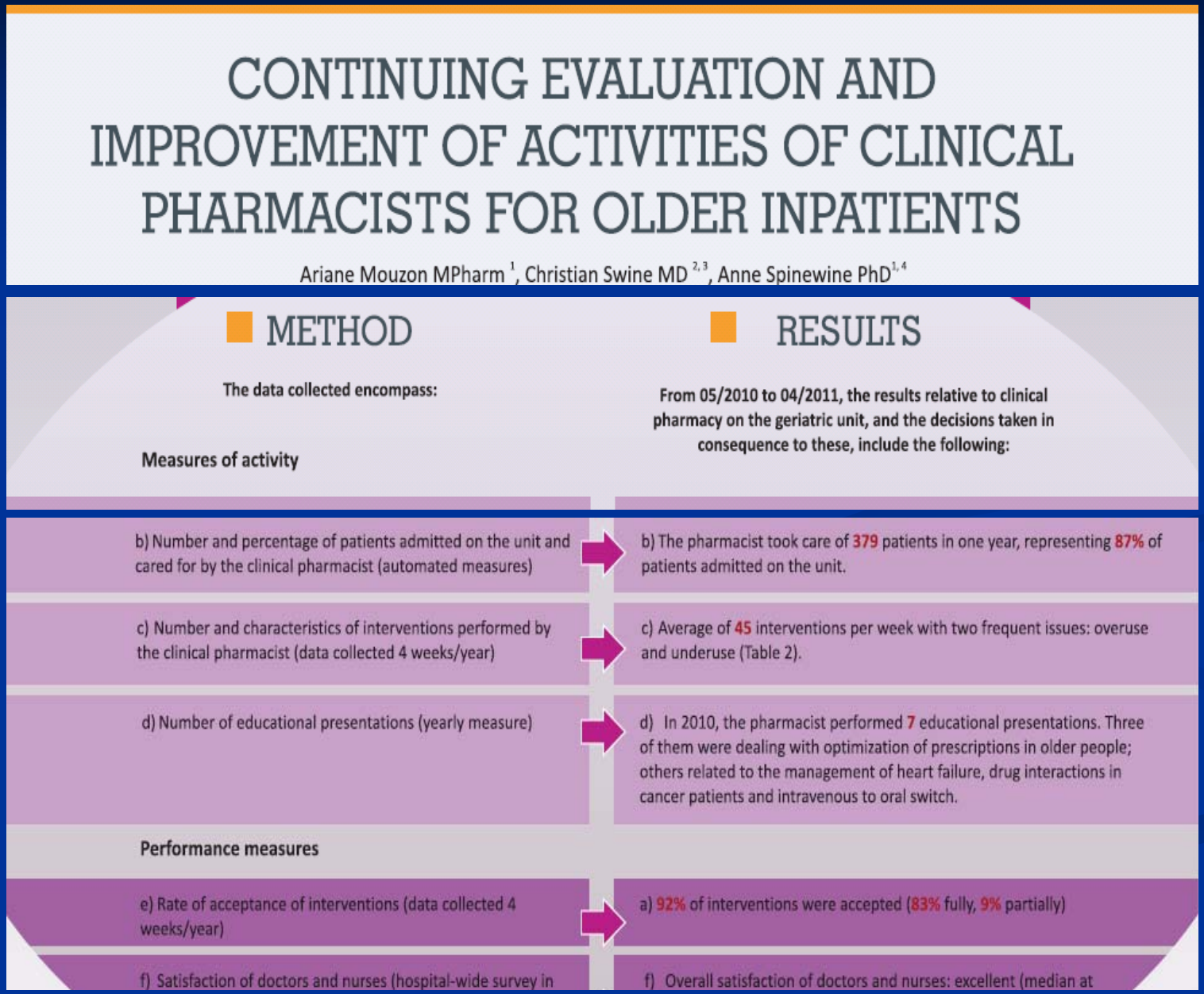
Summary: Key success factors

- Knowledge and skills
- Full access to patients' records
  - Past medical Hx, drug Hx, laboratory data, evolution,…
- See the patient/carer
  - Drug history, compliance,…
- Close collaboration with other HCPs
  - Multidisciplinary team work

Summary: Perspectives

- Effect on ADEs
- Cost-effectiveness
- Patient targeting: how?
- Standardisation of interventions; team-based
- Multi-center European studies
- Effect of direct participation of patients or caregivers in the intervention process
- …

From clinical trials to daily practice



CONTINUING EVALUATION AND IMPROVEMENT OF ACTIVITIES OF CLINICAL PHARMACISTS FOR OLDER INPATIENTS

Ariane Mouzon MPharm [1], Christian Swine MD [2,3], Anne Spinewine PhD [1,4]

METHOD

The data collected encompass:

Measures of activity

b) Number and percentage of patients admitted on the unit and cared for by the clinical pharmacist (automated measures)

c) Number and characteristics of interventions performed by the clinical pharmacist (data collected 4 weeks/year)

d) Number of educational presentations (yearly measure)

Performance measures

e) Rate of acceptance of interventions (data collected 4 weeks/year)

f) Satisfaction of doctors and nurses (hospital-wide survey in

RESULTS

From 05/2010 to 04/2011, the results relative to clinical pharmacy on the geriatric unit, and the decisions taken in consequence to these, include the following:

b) The pharmacist took care of 379 patients in one year, representing 87% of patients admitted on the unit.

c) Average of 45 interventions per week with two frequent issues: overuse and underuse (Table 2).

d) In 2010, the pharmacist performed 7 educational presentations. Three of them were dealing with optimization of prescriptions in older people; others related to the management of heart failure, drug interactions in cancer patients and intravenous to oral switch.

a) 92% of interventions were accepted (83% fully, 9% partially)

f) Overall satisfaction of doctors and nurses: excellent (median at

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Thank you for your attention

Thanks to

- Stephen Byrne and Daniela Fialova

- all Belgian colleagues that moved clinical pharmacy forward

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- **2-** No benefits in any form have been or will be received from a commercial party related directly or indirectly to the subject of this presentation.