The Role of Pharmacists – achieving international best practice standards and realising key opportunities.

Dr. Stephen Byrne

Senior Lecturer in Clinical Pharmacy &
Director of the MSc in Clinical Pharmacy
University College Cork

stephen.byrne@ucc.ie

School of Pharmacy
University College Cork

Conflict of Interests

Co-inventor/author of STOPP/START

Board Member

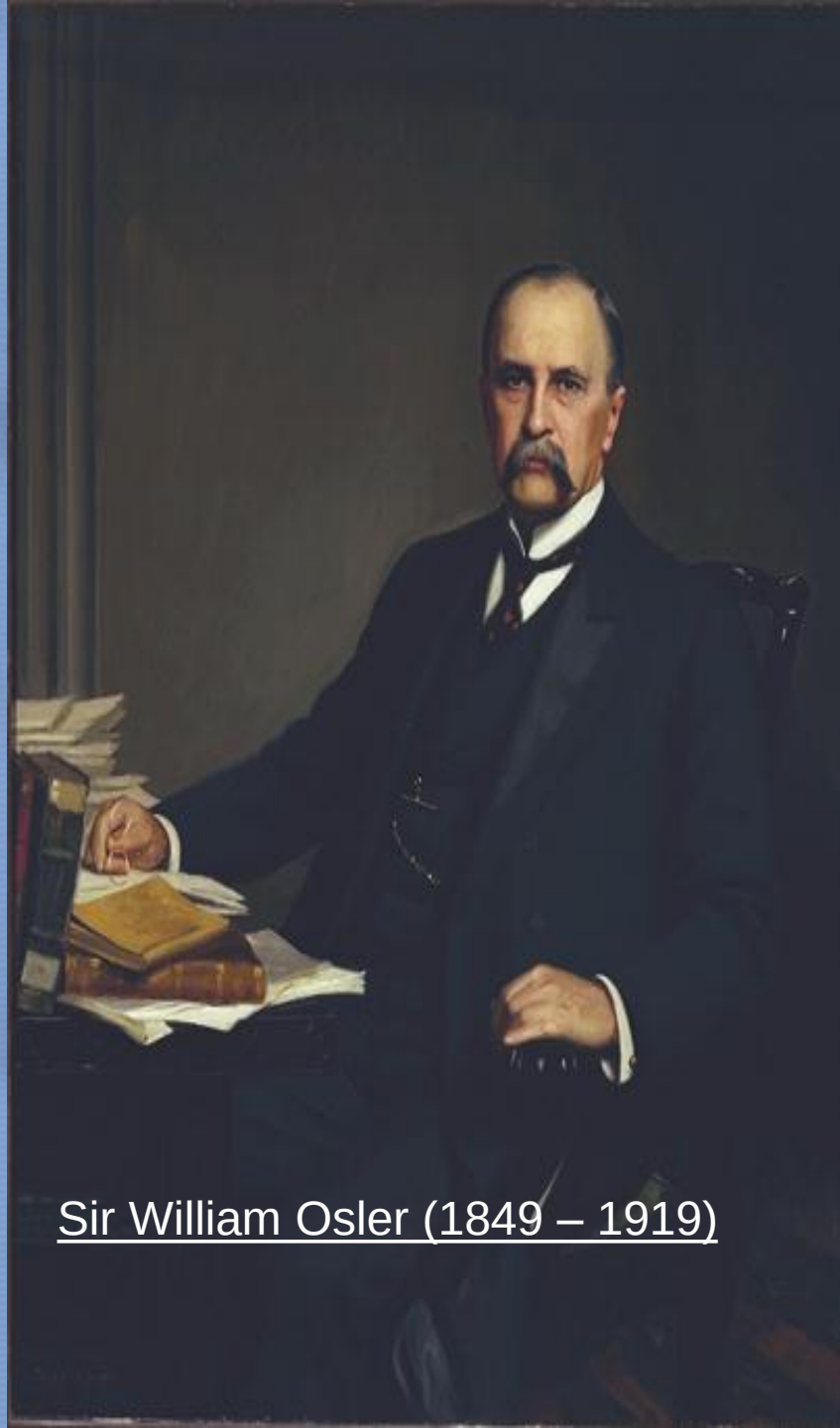
Clinical Support Information Systems Ltd.,

No other relevant to this talk

Research Grants/Awards

"One of the first duties of the physician is to educate the masses ***not*** to take medicine."

"Imperative drugging – the ordering of medicine in any and every malady (i.e. polypharmacy) - is no longer regarded as the chief function of the doctor."



Sir William Osler (1849 – 1919)

Shift from Product to Patient-Orientated Profession

"The pharmacist has lost his professional standing primarily because the patient cannot visualize him as a tradesman and a professional simultaneously "

The Dichter Report, 1973

"The most truthful thing I can say about pharmacy practice is this: it is an occupation psychically bound to the act of providing medications to patients, but which knows that it must find a new reason for being."

Zellmer, 1996

"I feel that it's sort of been stuck in a situation that things have not changed in the last number of years"
"There is a blockage of mind set within the HSE … Traditionally we were just seen as dispensers; in their mindset we will always be dispensers."

Baseline Study of Community Pharmacy Practice in Ireland, PSI, 2011.

Elderly

Coagulation

Medicines Management - Appropriate Use

International Best Practice Research

The Future – Role for Pharmacists

Appropriate Use of Medicines in Ireland Where Are We?

Are we tackling the problem!

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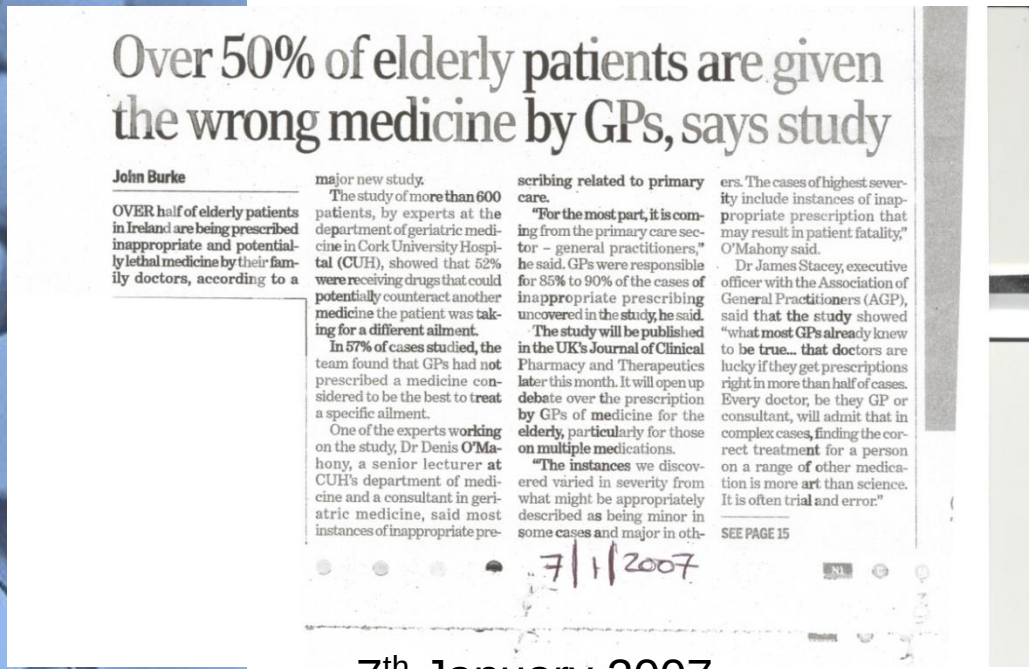

Over 50% of elderly patients are given the wrong medicine by GPs, says study

John Burke

OVER half of elderly patients in Ireland are being prescribed inappropriate and potentially lethal medicine by their family doctors, according to a major new study.

The study of more than 600 patients, by experts at the department of geriatric medicine in Cork University Hospital (CUH), showed that 52% were receiving drugs that could potentially counteract another medicine the patient was taking for a different ailment.

In 57% of cases studied, the team found that GPs had not prescribed a medicine considered to be the best to treat a specific ailment.

One of the experts working on the study, Dr Denis O'Mahony, a senior lecturer at CUH's department of medicine and a consultant in geriatric medicine, said most instances of inappropriate prescribing related to primary care.

"For the most part, it is coming from the primary care sector – general practitioners," he said. GPs were responsible for 85% to 90% of the cases of inappropriate prescribing uncovered in the study, he said.

The study will be published in the UK's Journal of Clinical Pharmacy and Therapeutics later this month. It will open up debate over the prescription by GPs of medicine for the elderly, particularly for those on multiple medications.

"The instances we discovered varied in severity from what might be appropriately described as being minor in some cases and major in others. The cases of highest severity include instances of inappropriate prescription that may result in patient fatality," O'Mahony said.

Dr James Stacey, executive officer with the Association of General Practitioners (AGP), said that the study showed "what most GPs already knew to be true... that doctors are lucky if they get prescriptions right in more than half of cases. Every doctor, be they GP or consultant, will admit that in complex cases, finding the correct treatment for a person on a range of other medication is more art than science. It is often trial and error."

SEE PAGE 15

7/1/2007

7th January 2007

Irish Daily Mirror
MONDAY 04.01.2010

BLUNDER GPs GIVE OLD PEOPLE WRONG DRUGS

Report blasts doctors

BY SARAH BARDON
news@irishmirror.ie

THE lives of elderly people are being put at risk because of bungling doctors, it was claimed yesterday.

A study by University College Cork showed more than one in every five older patients are given "inappropriate and potentially-harmful medicine".

GPs are also failing to prescribe the ideal medicine for more than 22% of those they treat.

The wrong prescriptions have caused healthy elderly people to suffer adverse drug reactions and to be hospitalised.

Age Action spokesman Eamon Timmins said something needs to change or people will stop visiting their doctors. He added: "You presume if your GP gives you a prescription that he is giving you the most appropriate medication.

"We are talking about the sicker, frailer part of the elderly population who have a number of health problems and need to be medicated very carefully."

The study examined more than 6,680 prescriptions handed out by GPs to 1,329 patients over the age of 65. It found more than 280 were given 346 separate medications which were not appropriate.

Proper medication was not given in 333 cases, relating to more than 300 patients. Most of the cases reviewed were elderly women.

Mr Timmins said: "We have seen numerous studies like this in the past three years with the same results. We wrote to the General College of Practitioners and heard nothing back.

"The medical profession needs to sit up and take notice of this. What is the reason for it? Is it lack of training for the GP?

"Minister Harney has introduced charges to combat over-prescribing and the overuse of medication but she needs to look at the medical profession as well because elderly people's lives are at risk."

BITTER-SWEET DAY

A SICILIAN man stole sweets and chewing gum so he could get arrested and spend New Year's Eve in jail rather than be with his wife and relatives.

4th April 2010

Irish Daily

THURSDAY, APRIL 7, 2011

Elderly patients being given 'inapp

By **Petrina Vousden**
Health Correspondent

ALMOST three-quarters of the elderly in nursing homes are being prescribed the wrong medication, research shows.

It found seven out ten older patients are being given at least one 'inappropriate' medicine, while nearly a fifth are receiving three or more.

And it revealed that benzodiazepine sedatives were the most common 'potentially inappropriately prescribed medication', accounting for 38 per cent of cases.

The report also warned the sedatives were often being given to people who had suffered past falls and that it had 'been widely documented that the use of benzodiazepines in individuals already predisposed to falls can further contribute to future falls'.

The study, which was led by Dr Stephen Byrne, a senior lecturer in clinical pharmacy at University College Cork, looked at 630 elderly in long-term care in the North and Cork.

It found the patients were receiving, on average, 11 medicines each, while half were being prescribed between 14 and 18 drugs.

In one 'extreme case', a patient was found to have been prescribed 25 different medicines.

7th April 2011

IRISH TIMES

Thursday, April 7, 2011

Concern over medicine use for elderly

AOIFE CARR

SEVEN OUT of 10 older people in nursing homes in Ireland are being given inappropriate medication, according to a report launched yesterday.

Benzodiazepines, nonsteroidal anti-inflammatories and medicines used to treat urinary incontinence and indigestion were found to be the drugs most commonly inappropriately prescribed.

The report was funded by the Centre for Ageing Research and Development in Ireland (Cardi) and carried out by a cross-Border research team led by Dr Stephen Byrne, senior lecturer in clinical pharmacy at University College Cork.

A total of 315 residents over 65 years of age were randomly selected from 14 nursing homes in Co Cork and were age- and gender-matched with 315 residents of nursing homes in Northern Ireland. Their medical notes were reviewed in detail between December 2009 and September 2010.

It was discovered that 73 per cent of those surveyed in the Republic were receiving at least one potentially inappropriate medicine while 67 per cent of those in nursing homes in the North were affected by the issue.

Nearly one-fifth of those reviewed were receiving three or more inappropriate medicines. The cost of this was estimated at €356 per person.

7th April 2011

Background

- Individuals ≥65 years constitute
  - ❑ 11% of the Irish population
  - ❑ By 2041 this is estimated to rise 20% of the population.
  - ❑ 4.6% of individuals ≥65 years reside in long term care.
  - ❑ Medications prescriptions are a crucial aspect of older persons care.
    - ➢ Cure/Eliminate disease
    - ➢ Reduce symptoms
    - ➢ Improve functional capacity.

Hanlon J. T., et al. J Am Geriatr Soc, 2001 49 (2), 200-9.
World Health Organization (2003) Adherence to long-term therapies, Evidence for actio
CSO Census 2006 & Mercer Report 2010

Suboptimal/Potentially Inappropriate Prescribing in Older Persons encompasses:

1. Potential Inappropriate Prescribing (PIP) i.e. Potential Inappropriate drug choice
2. Dose and frequency that are in excess of what is clinically indicated
3. Polypharmacy (>5 medicines):
4. Potential Prescribing Omissions (PPOs) of clinically beneficial medications

Screening Tools

- Beers' Criteria (US 2003): Considering Diagnoses (CD) and Independent of Diagnoses (ID)

International Primary Care Studies		
Turkey	9.8%	2005
Finland	12.5%	2002
Poland	29%	2007
USA	21.3%	2001

Ay *et al.* (2005), Pitkala *et al.* (2002), Rajska-Neumann *et al.* (2007), Zhan *et al.* (2001)

Journal of Clinical Pharmacy and Therapeutics (2009) **34**, 369–376 doi:10.1111/j.1365-2710.2008.01007.x

ORIGINAL ARTICLE

Appropriate prescribing in the elderly: an investigation of two screening tools, Beers criteria considering diagnosis and independent of diagnosis and improved prescribing in the elderly tool to identify inappropriate use of medicines in the elderly in primary care in Ireland

C. Ryan* MPharm, D. O'Mahony†‡ MD, J. Kennedy* PhD, P. Weedle* PhD, P. Barry† MRCPI, P. Gallagher† MRCPI and S. Byrne* PhD

**Pharmaceutical Care Research Group, School of Pharmacy, University College Cork, †Department of Geriatric Medicine, Cork University Hospital and ‡School of Medicine, University College Cork, Cork, Ireland*

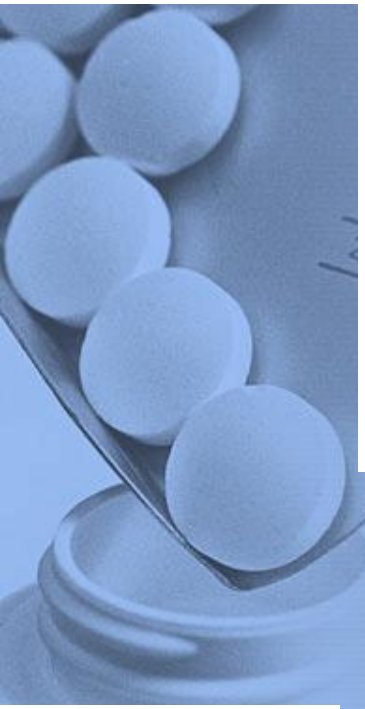

Table 3. Comparison of the Beers criteria and IPET for identification of inappropriate prescribing

Tool	No. of PIMs	% of patients with PIM	No. of pts with 1 PIM	No. of pts with 2 PIMs	No. of pts with 4 PIMs	NIC (€) per month
Beers CD	8	1·4	6	1	–	66·17
Beers ID	61	11·6	55	3	–	758·71
IPET	63	10·4	43	8	1	381·28

PIM, potentially inappropriate medicines; NIC, net ingredient cost; CD, considering diagnosis; ID, independent of diagnosis; IPET, improved prescribing in the elderly tool.

- Beers' criteria identified a total of 69 medicines in 65 patients (13%), costing €824.88 per

School of Pharmacy
University College Cork

Prevalence rates of PIP in Ireland (Beers' criteria, 2003 version)

- **Primary Care: 13% – 18% (n=1329/500)**

  Ryan C et al., *Br J Clin Pharmacol* 2009

  Ryan C et al., *J Clin Pharm Ther* 2009

- **Secondary Care: 25% – 32% (n=350/597)**

  Barry PJ et al., *J Clin Pharm Ther* 2006

  Gallagher P et al., *Age Ageing* 2008

- **Nursing Home Care: 37% – 55 % (n=295/715)**

  Byrne S et al., *Int J Pharm Pract* 2008

  O'Sullivan D et al., *Eur Ger Med* 2010

International Journal of Clinical Pharmacology and Therapeutics, Vol. 46 – No. 2/2008 (72-83)

Original

ISSN 0946-1965

STOPP (Screening Tool of Older Person's Prescriptions) and START (Screening Tool to Alert doctors to Right Treatment). Consensus validation

P. Gallagher[1], C. Ryan[2], S. Byrne[2], J. Kennedy[2] and D. O'Mahony[3]

[1]Department of Geriatric Medicine, Cork University Hospital, Wilton, Cork, [2]School of Pharmacy and [3]Department of Medicine, University College Cork, Cork, Ireland

Gallagher *et al., Intern J Clin Pharm Ther 2008.*

BJCP British Journal of Clinical Pharmacology

School of Pharmacy
University College Cork

Potentially inappropriate prescribing in an Irish elderly population in primary care

Cristín Ryan,[1] Denis O'Mahony,[2,3] Julia Kennedy,[1] Peter Weedle[1] & Stephen Byrne[1]

[1]Pharmaceutical Care Research Group, School of Pharmacy, [2]School of Medicine, University College Cork and [3]Department of Geriatric Medicine, Cork University Hospital, Cork, Ireland

Correspondence
Dr Stephen Byrne, Senior Lecturer in Clinical Pharmacy, School of Pharmacy, University College Cork, Ireland.
Tel: +353 (021) 4901658
Fax: +353 (021) 4901656
E-mail: stephen.byrne@ucc.ie

Keywords
elderly patients, primary care, screening tools

Received
23 January 2009
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14 August 2009

WHAT IS ALREADY KNOWN ABOUT THIS SUBJECT

• Potentially inappropriate prescribing in

Prospective Cohort study to evaluate the impact of STOPP/START

Ryan C, *et al.* Br J Clin Pharmacol. 2009 Dec;68(6):936-47

BJCP British Journal of Clinical Pharmacology

School of Pharmacy
University College Cork

Potentially inappropriate pre… po…

Cristín…
Stephe…
[1]Pharmac…
Cork and…

Correspondence
Dr Stephen Byrne, Senior Lecturer in Clinical Pharmacy, School of Pharmacy, University College Cork, Ireland

METHODS

Case records of 1329 patients ≥65 years old from three general practices in one region of southern Ireland were studied. The mean age ± SD of the patients was 74.9 ± 6.4 years, 60.9% were female. Patients' current diagnoses and prescription medicines were reviewed and the Beers' criteria, STOPP and START tools applied.

RESULTS

The total number of medicines prescribed was 6684; median number of medicines per patient was five (range 1–19). Overall, Beers' criteria identified 286 potentially inappropriate prescriptions in 18.3% (243) of patients, whilst the corresponding IP rate identified by STOPP was 21.4% (284), in respect of 346 potentially inappropriate prescriptions. A total of 333 PPOs were identified in 22.7% (302) of patients using the START tool.

Prosp… the im…

Ryan C, *et al.* Br J Clin Pharmacol. 2009 Dec;68(6):936-47

- Key offenders
  - Beers
    - Benzodiazepines n=149
    - Doxasozin n=86
  - STOPP
    - PPI n=102
    - Benzo n=69
    - NSAIDs with HTN n=39

- NIC € per month
  - **Beers**
    - €3,130.60
    - €745.38
  - **STOPP**
    - €6,339.97
  - **START**
    - €3,214.53

Incidences of Potential Inappropriate Prescribing in Long Term Care Facilities in the Greater Cork Area

Researcher: David O'Sullivan

Pharmaceutical Care Research Group, School of Pharmacy, University College Cork

CARDI
Centre for Ageing Research and Development in Ireland

Queen's University Belfast

School of Pharmacy
University College Cork

Patient Demographics

Demographics	RoI Dataset (n=732)
Male	228 (29.8%)
Female	514 (70.2%)
Age Median*	85
Inter Quartile Range	79-89
No. of medicines prescribed	8,325
No. of regular medicines prescribed	5,902
No. of “prn” medicines prescribed	2,423
Median number of medicines prescribed	11
IQR of medicines prescribed	9-14
Median number of regular medicines	8
IQR of regular medicines	6-10

*Calculated in years

The rates of PIP calculated per cohort by STOPP

Tool	No. of instances of PIP	No. of PIMs	% of PIMs	Mean No. Of PIMs per Residents	No. Of Residents with PIP	% Residents with at least one instances of PIP
STOPP	1280	1140	**13.7%**	1.6	518	70.8%
STOPP (Excluding *as required medicines*)	995	836	14.2%	1.1	466	63.7%

The rates of PPO calculated per cohort by START

Tool	No. of instances of PPO	Mean No. Of PPOs per Residents	No. Of Residents with PIP	% Residents with at least one instances of PIP
START	614	0.8	419	**57.1%**

Geriatrics

Application of STOPP and START Criteria: Interrater Reliability Among Pharmacists

Cristin Ryan, Denis O'Mahony, and Stephen Byrne

The Annals of Pharmacotherapy ■ *2009 July/August, Volume 43*

METHODS: Ten pharmacists (5 hospital pharmacists, 5 co
were given 20 patient profiles containing details includin
sex, current medications, current diagnoses, releva
biochemical data, and estimated glomerular filtration
applied the STOPP and START criteria to each patient
PEOs identified by each pharmacist were compared wit
pharmacists who were highly familiar with the application
An interrater reliability analysis using the κ statistic (chanc
agreement) was performed to determine consistency betw

RESULTS: The median κ coefficients for hospital pharm
pharmacists compared with the academic pharmacists for
0.88, respectively, while those for START were 0.91 and 0

Table 2. Comparison of PIMs and PEOs by Pharmacists Using STOPP and START

Comparators	ppos	pneg	Median κ ($p < 0.01$; 95% CI)
STOPP			
SA			
HPs	0.87	0.99	0.89 (0.68 to 1.0)
CPs	0.88	0.99	0.88 (0.67 to 1.0)
Inter HPs	0.80	0.99	0.82 (0.55 to 1.0)
Inter CPs	0.75	0.99	0.78 (0.46 to 0.99)
START			
SA			
HPs	0.83	0.99	0.91 (0.75 to 1.0)
CPs	0.87	0.99	0.90 (0.76 to 1.0)
Inter HPs	0.83	0.99	0.90 (0.70 to 1.0)
Inter CPs	0.79	0.99	0.82 (0.57 to 0.99)

CPs = community pharmacists; HPs = hospital pharmacists; Inter = comparison among pharmacists working in the same setting; PEO = potential errors of omission; PIM = potentially inappropriate medicines; pneg = proportion of negative agreement; ppos = proportion of positive agreement; SA = standard answers; START = Screening Tool to Alert doctors to Right Treatment; STOPP = Screening Tool of Older Peoples' Prescriptions.

Internationally - What are pharmacists doing?

Effect of a Collaborative Approach on the Quality of Prescribing for Geriatric Inpatients: A Randomized, Controlled Trial

Anne Spinewine, PhD, Christian Swine, MD,*§ Soraya Dhillon, PhD,‖ Philippe Lambert, PhD,¶ Jean B. Nachega, MD, MPH, DTM&H,#** Léon Wilmotte, MPharm,*† and Paul M. Tulkens, MD, PhD*‡*

JAGS 55:658–665, 2007

OBJECTIVES: To evaluate the effect of pharmaceutical care provided in addition to acute Geriatric Evaluation and Management (GEM) care on the appropriateness of prescribing.

DESIGN: Randomized, controlled trial, with the patient as unit of randomization.

SETTING: Acute GEM unit.

PARTICIPANTS: Two hundred three patients aged 70 and older.

INTERVENTION: Pharmaceutical care provided from admission to discharge by a specialist clinical pharmacist who had direct contacts with the GEM team and patients.

MEASUREMENTS: Appropriateness of prescribing on admission, at discharge, and 3 months after discharge, using the Medication Appropriateness Index (MAI), Beers criteria, and Assessing Care of Vulnerable Elders (ACOVE) underuse criteria and mortality, readmission, and emergency visits up to 12 months after discharge.

RESULTS: Intervention patients were significantly more likely than control patients to have an improvement in the MAI and in the ACOVE underuse criteria from admission to discharge (odds ratio (OR) = 9.1, 95% confidence interval (CI) = 4.2–21.6 and OR = 6.1, 95% CI = 2.2–17.0, respectively). The control and intervention groups had comparable improvements in the Beers criteria.

CONCLUSION: Pharmaceutical care provided in the context of acute GEM care improved the appropriate use of medicines during the hospital stay and after discharge. This is an important finding, because only limited data exist on the effect of various strategies to improve medication use in elderly inpatients. The present approach has the potential to minimize risk and improve patient outcomes. **J Am Geriatr Soc 55:658–665, 2007.**

Key words: drug therapy; appropriateness; randomized controlled trial; pharmaceutical care; acute geriatric care

Inappropriate use of medicines in elderly patients is of major concern to clinicians and public health authorities. Drug-related problems are implicated in 10% to 30% of hospital admissions in older people.[1–4] Moreover, adverse drug reactions occur during hospital stays in up to half of these patients.[3] A recent study found that 42% of elderly inpatients were prescribed at least one drug without valid indication and that dosage or duration was inadequate in about half of these patients.[5] Conversely, medicines for conditions such as heart failure or osteoporosis remain underused in 20% to 70% of patients.[6,7] Medication errors are also frequent during transition between acute and post-

Internationally - What are pharmacists doing?

ORIGINAL INVESTIGATION

A Comprehensive Pharmacist Intervention to Reduce Morbidity in Patients 80 Years or Older

A Randomized Controlled Trial

Ulrika Gillespie, MSc Pharm; Anna Alassaad, MSc Pharm; Dan Henrohn, MD, MSc, Pharm; Hans Garmo, PhD; Margareta Hammarlund-Udenaes, PhD; Henrik Toss, MD, PhD; Åsa Kettis-Lindblad, PhD; Håkan Melhus, MD, PhD; Claes Mörlin, MD, PhD

Background: Patients 80 years or older are underrepresented in scientific studies. The objective of this study was to investigate the effectiveness of interventions performed by ward-based pharmacists in reducing morbidity and use of hospital care among older patients.

Methods: A randomized controlled study of patients 80 years or older was conducted at the University Hospital of Uppsala, Uppsala, Sweden. Four hundred patients were recruited consecutively between October 1, 2005, and June 30, 2006, and were randomized to control (n=201) and intervention (n=199) groups. The interventions were performed by ward-based pharmacists. The control group received standard care without direct involvement of pharmacists at the ward level. The primary outcome measure was the frequency of hospital visits (emergency department and readmissions [total and drug-related]) during the 12-month follow-up period.

Results: Three hundred sixty-eight patients (182 in the intervention group and 186 in the control group) were analyzed. For the intervention group, there was a 16% reduction in all visits to the hospital (quotient, 1.88 vs 2.24; estimate, 0.84; 95% confidence interval [CI], 0.72-0.99) and a 47% reduction in visits to the emergency department (quotient, 0.35 vs 0.66; estimate, 0.53; 95% CI, 0.37-0.75). Drug-related readmissions were reduced by 80% (quotient, 0.06 vs 0.32; estimate, 0.20; 95% CI, 0.10-0.41). After inclusion of the intervention costs, the total cost per patient in the intervention group was $230 lower than that in the control group.

Conclusion: If implemented on a population basis, the addition of pharmacists to health care teams would lead to major reductions in morbidity and health care costs.

Trial Registration: clinicaltrials.gov Identifier: NCT00661310

Arch Intern Med. 2009;169(9):894-900

Potentially inappropriate prescribing in older hospitalised patients – the impact of the STOPP/START criteria on prescribing appropriateness and an evaluation of the setting in which this screening tool is applied -a pilot study.

- The most frequent PIP included
- proton pump inhibitors, laxatives, neuroleptics, statins and benzodiazepines.
- A12.4% reduction in the MAI score of the study group (paired t test p=0.001)

Ryan A *et al. 2011 under review*

Nursing Homes!

JAGS JANUARY 2010–VOL. 58, NO. 1

An Evaluation of an Adapted U.S. Model of Pharmaceutical Care to Improve Psychoactive Prescribing for Nursing Home Residents in Northern Ireland (Fleetwood Northern Ireland Study)

Susan M. Patterson, PhD, Carmel M. Hughes, PhD,* Grainne Crealey, PhD,† Chris Cardwell, PhD,‡ and Kate L. Lapane, PhD§*

OBJECTIVES: To test the effect of an adapted U.S. model of pharmaceutical care on prescribing of inappropriate psychoactive (anxiolytic, hypnotic, and antipsychotic) medications and falls in nursing homes for older people in Northern Ireland (NI).

DESIGN: Cluster randomized controlled trial.

SETTING: Nursing homes randomized to intervention (receipt of the adapted model of care; n = 11) or control (usual care continued; n = 11).

PARTICIPANTS: Residents aged 65 and older who provided informed consent (N = 334; 173 intervention, 161 control).

INTERVENTION: Specially trained pharmacists visited intervention homes monthly for 12 months and reviewed residents' clinical and prescribing information, applied an algorithm that guided them in assessing the appropriateness of psychoactive medication, and worked with prescribers (general practitioners) to improve the prescribing of these drugs. The control homes received usual care.

MEASUREMENTS: The primary end point was the proportion of residents prescribed one or more inappropriate psychoactive medicine according to standardized protocols; falls were evaluated using routinely collected falls data mandated by the regulatory body for nursing homes in NI.

RESULTS: The proportion of residents taking inappropriate psychoactive medications at 12 months in the intervention homes (25/128, 19.5%) was much lower than in the control homes (62/124, 50.0%) (odds ratio = 0.26, 95% confidence interval = 0.14–0.49) after adjustment for clustering within homes. No differences were observed at 12 months in the falls rate between the intervention and control groups.

CONCLUSION: Marked reductions in inappropriate psychoactive medication prescribing in residents resulted from pharmacist review of targeted medications, but there was no effect on falls. **J Am Geriatr Soc 58:44–53, 2010.**

Key words: nursing homes; psychoactive medication; pharmaceutical care; cluster randomized controlled trial

Older people residing in nursing homes are recognized as frail and vulnerable with respect to prescribing of medication. Studies indicate that the prevalence of inappropriate prescribing, a modifiable risk factor for adverse drug events in older people, may be as high as 55% in nursing homes.[1] Many studies[2–4] and government reports[5,6] have highlighted the high rate of prescribing of psychoactive drugs (hypnotics, anxiolytics, and antipsychotics) in these facilities and have suggested that they may be used as chemical restraints.[6,7]

Legislation, as exemplified by the Nursing Home Reform Act, part of the of Omnibus Budgetary Reconciliation Act (OBRA) 1987, has attempted to improve prescribing of these medicines, but it has been recognized that this approach has not led to improvements in other areas of pharmacotherapy.[7] The Fleetwood U.S. project, a study of a

Age and Ageing 2004; **33:** 612–617
doi:10.1093/ageing/afh213

Published electronically 22 September 2004

An outreach geriatric medication advisory service in residential aged care: a randomised controlled trial of case conferencing

Maria Crotty[1], Julie Halbert[1], Debra Rowett[1], Lynne Giles[1], Robert Birks[1], Helena Williams[2], Craig Whitehead[1]

[1]Flinders University Department of Rehabilitation and Aged Care, Repatriation General Hospital, Daws Road, Daw Park, South Australia 5041, Australia
[2]Adelaide Southern Division of General Practice, 2a Jetty Road, Brighton, South Australia 5048, Australia

Address correspondence to: M. Crotty, Flinders University Department of Rehabilitation and Aged Care, Repatriation General Hospital, Daws Road, Daw Park, South Australia 5041, Australia. Fax (+618) 8275 1130. Email: Maria.Crotty@flinders.edu.au

Abstract

Background: efficient strategies are needed to provide specialist advice in nursing homes to ensure quality medical care. We describe a case conference intervention involving a multidisciplinary team of health professionals.
Objectives: to evaluate the impact of multidisciplinary case conferences on the appropriateness of medications and on patient behaviours in high-level residential aged care facilities.
Design: cluster-randomised controlled trial.
Setting: ten high-level aged care facilities.
Participants: 154 residents with medication problems and/or challenging behaviours were selected for case conference by residential care staff.
Intervention: two multidisciplinary case conferences involving the resident's general practitioner, a geriatrician, a pharmacist and residential care staff were held at the nursing home for each resident.
Measurements: outcomes were assessed at baseline and 3 months. The primary outcome was the Medication Appropriateness Index (MAI). The behaviour of each resident was assessed via the Nursing Home Behaviour Problem Scale.
Results: 45 residents died before follow-up. Medication appropriateness improved in the intervention group [MAI mean change 4.1, 95% confidence interval (CI) 2.1–6.1] compared with the control group (MAI mean change 0.4, 95% CI −0.4–1.2; $P < 0.001$). There was a significant reduction in the MAI for benzodiazepines (mean change control −0.38, 95% CI −1.02–0.27 versus intervention 0.73, 95% CI 0.16–1.30; $P = 0.017$). Resident behaviours were unchanged after the intervention and the improved medication appropriateness did not extend to other residents in the facility.
Conclusion: multidisciplinary case conferences in nursing homes can improve care. Outreach specialist services can be delivered without direct patient contact and achieve improvements in prescribing.

Primary Care!

Treatment reviews of older people on polypharmacy in primary care:
cluster controlled trial comparing two approaches

Wilma Denneboom, Maaike GH Dautzenberg, Richard Grol and Peter AGM De Smet

ABSTRACT

Background
Older people are prone to problems related to use of medicines. As they tend to use many different medicines, monitoring pharmacotherapy for older people in primary care is important.

Aim
To determine which procedure for treatment reviews (case conferences versus written feedback) results in more medication changes, measured at different moments in time. To determine the costs and savings related to such an intervention.

Design of study
Randomised, controlled trial, randomisation at the level of the community pharmacy.

Setting
Primary care; treatment reviews were performed by 28 pharmacists and 77 GPs concerning 738 older people (≥75 years) on polypharmacy (>five medicines).

Method
In one group, pharmacists and GPs performed case conferences on prescription-related problems; in the other group, pharmacists provided results of a treatment review to GPs as written feedback. Number of medication changes was counted following clinically-relevant recommendations. Costs and savings associated with the intervention at various times were calculated.

Results
In the case-conference group significantly more medication changes were initiated (42 versus 22, $P = 0.02$). This difference was also present 6 months after treatment reviews (36 versus 19, $P = 0.02$). Nine months after treatment reviews, the difference was no longer significant (33 versus 19, $P = 0.07$). Additional costs in the case-conference group seem to be covered by the slightly greater savings in this group.

Conclusion
Performing treatment reviews with case conferences leads to greater uptake of clinically-relevant recommendations. Extra costs seem to be covered by related savings. The effect of the intervention declines over time, so performing treatment reviews for older people should be integrated in the routine collaboration between GPs and pharmacists.

INTRODUCTION

Many older people suffer from chronic diseases for which medicines should be used. Older patients are more prone to problems related to their medicines because of the higher number they use, and because of a decline in cognitive and physical functioning. A previous study found that two-thirds of all older people have problems using their medicines correctly; and that these problems could lead to a deterioration in clinical condition for one of four older patients.[1] Another study by the current authors found that there are prescription-related points of concern, possibly leading to a deterioration in clinical condition, in the pharmacotherapy of almost all older patients studied; for example, using diazepam, a benzodiazepine with a long half-life and hence unsuitable for use by older people. These problems were considered to be of direct clinical relevance in 30% of patients.[2] The current intervention study focuses on prescribing medicines for older patients, rather than on user-related problems.

Monitoring pharmacotherapy for older people in primary care is important. One possible approach is the use of treatment reviews for individual patients by trained professionals (for example, GPs, clinical or community pharmacists, or two healthcare

W Denneboom, PharmD, junior researcher; R Grol, PhD, professor, Centre for Quality of Care Research, UMC St Radboud, Nijmegen; PAGM De Smet, PhD, professor Department of Clinical Pharmacy, UMC St Radboud, Nijmegen and Scientific Institute Dutch Pharmacists, The Hague; MGH Dautzenberg, PhD, senior researcher health care, DSP-group research and consultancy, Amsterdam, the

British Journal of General Practice, *September 2007*

Other Therapeutic areas!

Effectiveness of Pharmacist-Administered Diabetes Mellitus Education and Management Services

Kelly R. Ragucci, Pharm.D., Joli D. Fermo, Pharm.D., Andrea M. Wessell, Pharm.D., and Elinor C. G. Chumney, Ph.D.

Study Objectives. To evaluate the effectiveness of pharmacist-administered diabetes mellitus education and management services on selected diabetes performance measures. Additional goals were to compare outcomes with goals specified for patients with diabetes by the National Committee for Quality Assurance (NCQA) and identify areas for improvement.

Design. One-year observational study.

Setting. Three university-based primary care clinics.

Patients. One hundred ninety-one patients with diabetes.

Intervention. Pharmacist-provided diabetes education and management services.

Measurements and Main Results. Each patient was assessed for hemoglobin A_{1c} (A1C) values, blood pressure, low-density lipoprotein cholesterol (LDL) levels, and aspirin use at baseline and at 1 year after enrollment. Cost avoidance comparators were calculated for those patients with reductions in A1C of at least 1%. Average A1C at 1 year was 7.8% (range 4.5–13.9%) versus 9.5% (range 5.4–19%) at baseline (change -1.7%, $p<0.05$). Seventy-two patients (38%) experienced a 1% or greater reduction in A1C. Average blood pressure decreased over the study period from 141/79 to 135/75 mm Hg ($p=0.007$), but average LDL levels did not change to a statistically significant extent (114 to 112 mg/dl, $p>0.05$). Aspirin use increased from 34% at baseline to 73% at 1 year ($p<0.0001$). The program achieved the A1C and LDL values required to qualify for NCQA diabetes recognition. Based on an estimated savings of $820 for each 1% decrease in A1C, cost avoidance was calculated as $59,040.

Conclusion. Diabetes management services from clinical pharmacists achieved significant improvements in A1C values, blood pressure, and aspirin use. Continued efforts in diabetes education and management are needed to further improve clinical, economic, and humanistic outcomes.

Key Words: clinical pharmacist, diabetes, blood pressure, cholesterol, glycosylated hemoglobin, performance measures.

(Pharmacotherapy 2005;25(12):1809–1816)

Elderly

Coagulation

Medicines Management - Appropriate Use

International Best Practice Research

The Future – Role for Pharmacists

Randomised Control Trial of Supervised Patient Self-Testing of Warfarin Therapy Using an Internet Based Expert System

Hypothesis and Outcome Measures

The internet based system can provide comparable INR measurements to those provided by an AMS

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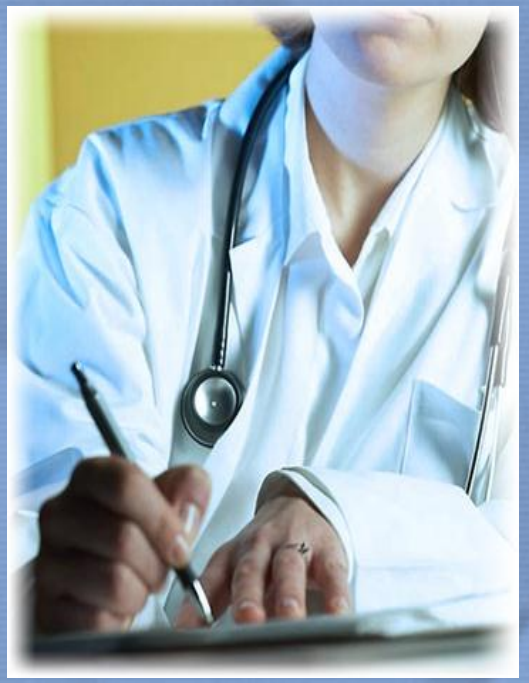
University College Cork

HRB Health Research Board
Roche
ZyCare

Patient Self-Testing

Anticoagulation Management Service



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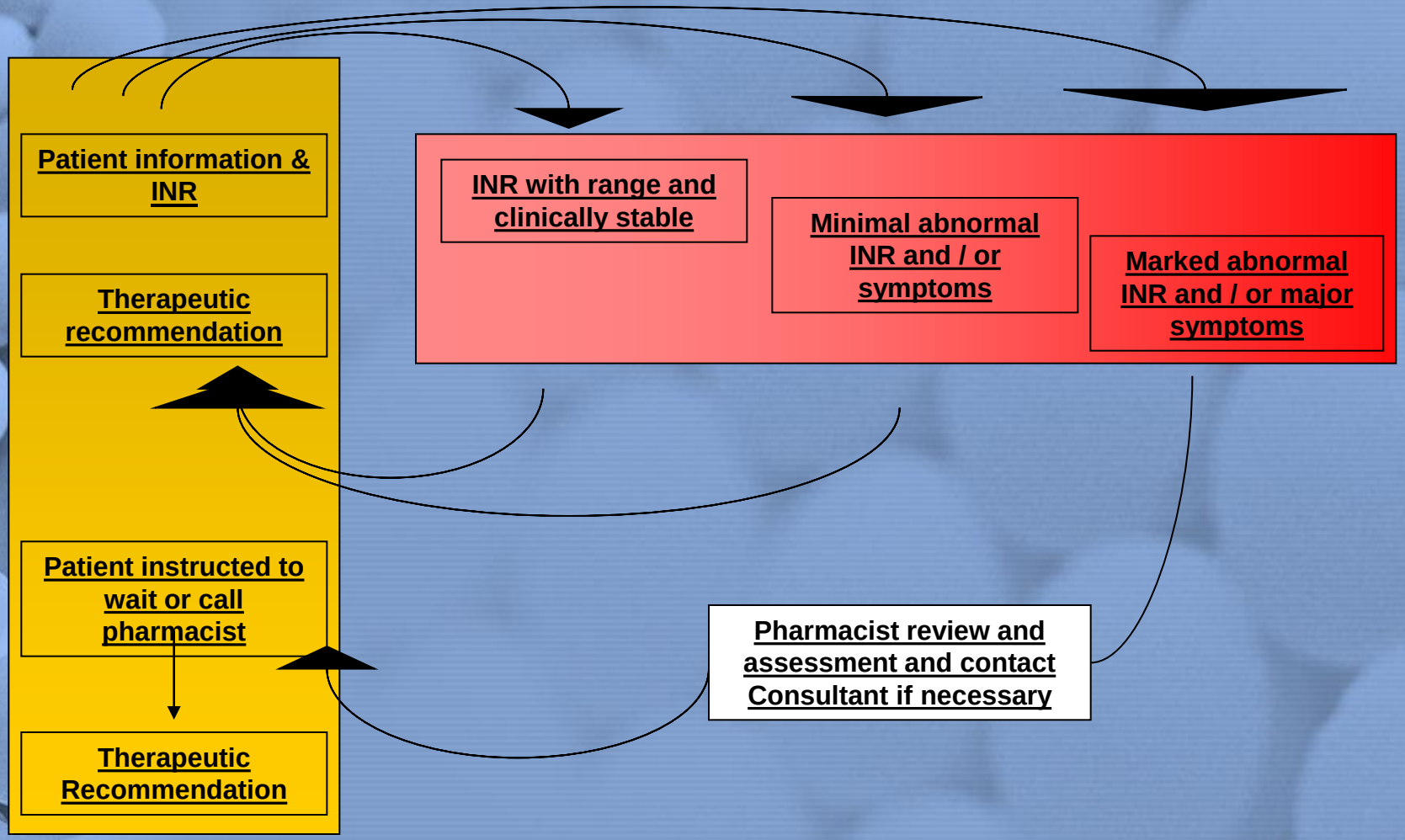
Patient information & INR
Therapeutic recommendation
Patient instructed to wait or call pharmacist
Therapeutic Recommendation
INR with range and clinically stable
Minimal abnormal INR and / or symptoms
Marked abnormal INR and / or major symptoms
Pharmacist review and assessment and contact Consultant if necessary
Patient
Pharmacist

Journal of Thrombosis and Haemostasis, 7: 1284–1290 DOI: 10.1111/j.1538-7836.2009.03497.x

ORIGINAL ARTICLE

Randomized controlled trial of supervised patient self-testing of warfarin therapy using an internet-based expert system

F. RYAN,* S. BYRNE* and S. O'SHEA†

*Pharmaceutical Care Research Group, University College Cork, Cork; and †Department of Haematology, Cork University Hospital, Cork, Ireland

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Introduction

Summary. *Background:* Increased frequency of prothrombin time testing, facilitated by patient self-testing (PST) of the International Normalized Ratio (INR) can improve the clinical outcomes of oral anticoagulation therapy (OAT). However, oversight of this type of management is often difficult and time-consuming for healthcare professionals. This study reports the first randomized controlled trial of an automated direct-to-patient expert system, enabling remote and effective management of patients on OAT. *Methods:* A prospective, randomized controlled cross-over study was performed to test the hypothesis that supervised PST using an internet-based, direct-to-patient expert system could provide improved anticoagulation control as compared with that provided by an anticoagulation management service (AMS). During the 6 months of supervised PST, patients measured their INR at home using a portable meter and entered this result, along with other information, onto the internet web page. Patients received instant feedback from the system as to what dose to take and when the next test was due. During the routine care arm, patients attended the AMS at least every 4–6 weeks and were dosed by the anticoagulation pharmacist or physician. The primary outcome variable was the difference in the time in therapeutic range (TTR) between both arms. *Results:* One hundred and sixty-two patients were enrolled (male 61.6%, mean age 58.7 years), and 132 patients (81.5%) completed both arms. TTR was significantly higher during PST management than during AMS management (median TTR 74% vs 58.6%; $z = 5.67$, $P < 0.001$). *Conclusions:* The use of an internet-based, direct-to-patient expert system for the management of PST improves the control of OAT as compared with AMS management.

Keywords: expert system, INR, oral anticoagulation, patient self-testing, teleheatlh, warfarin.

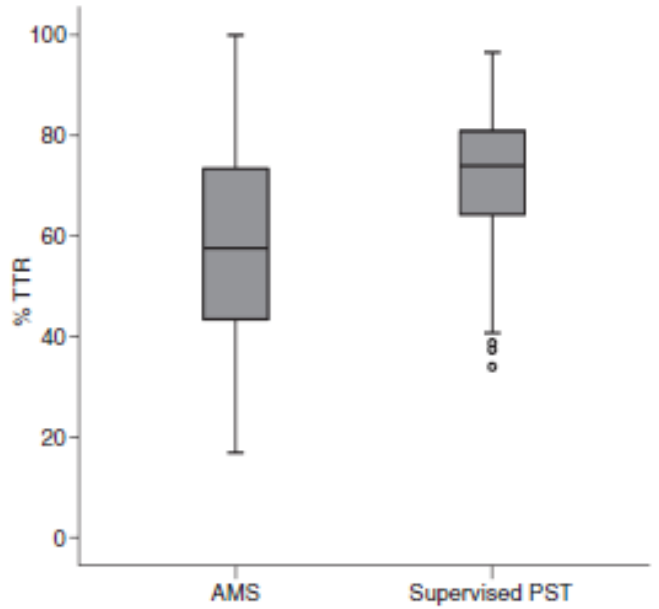

Fig. 2. Percentage time in therapeutic range (TTR) in anticoagulation management service (AMS) vs. internet-supervised patient self-testing (PST).

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University College Cork

Thrombosis Research 126 (2010) e345–e348

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journal homepage: www.elsevier.com/locate/thromres

Regular Article

The 'carry-over' effects of patient self-testing: Positive effects on usual care management by an anticoagulation management service

Fiona Ryan [a], Susan O'Shea [b], Stephen Byrne [a,*]

[a] Pharmaceutical Care Research Group, School of Pharmacy, University College Cork, Cork, Ireland
[b] Department of Haematology, Cork University Hospital, Cork, Ireland

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Carry-over effects
Patient self-testing
Oral anticoagulation therapy
Warfarin anticoagulant management service

ABSTRACT

Introduction: Patie
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outcome variable
range) between th
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Patients tested mo
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Patients with prev
(n = 107) that we
frequent monitori
Conclusions: The in
when patients cea

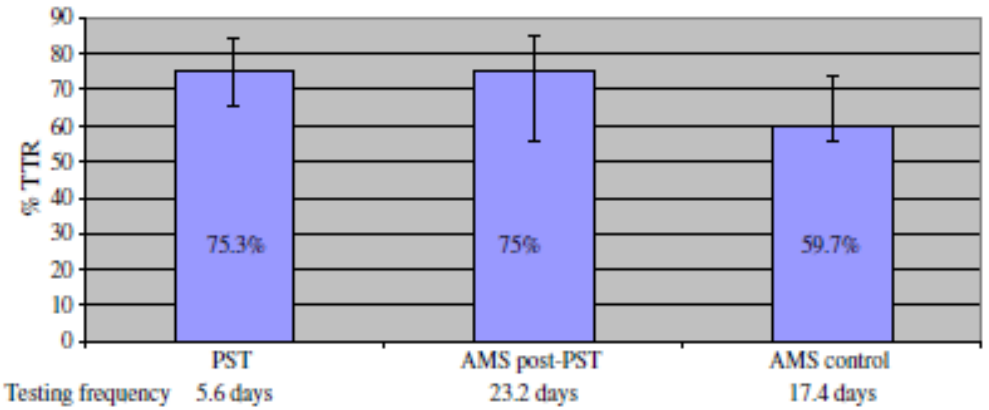

Fig. 3. Graph comparing the anticoagulation control (and testing frequency) of the study groups. Error bars represent the IQR.

control group of patients whose oral anticoagulation therapy was affect their anticoagulation control. These indirect benefits of

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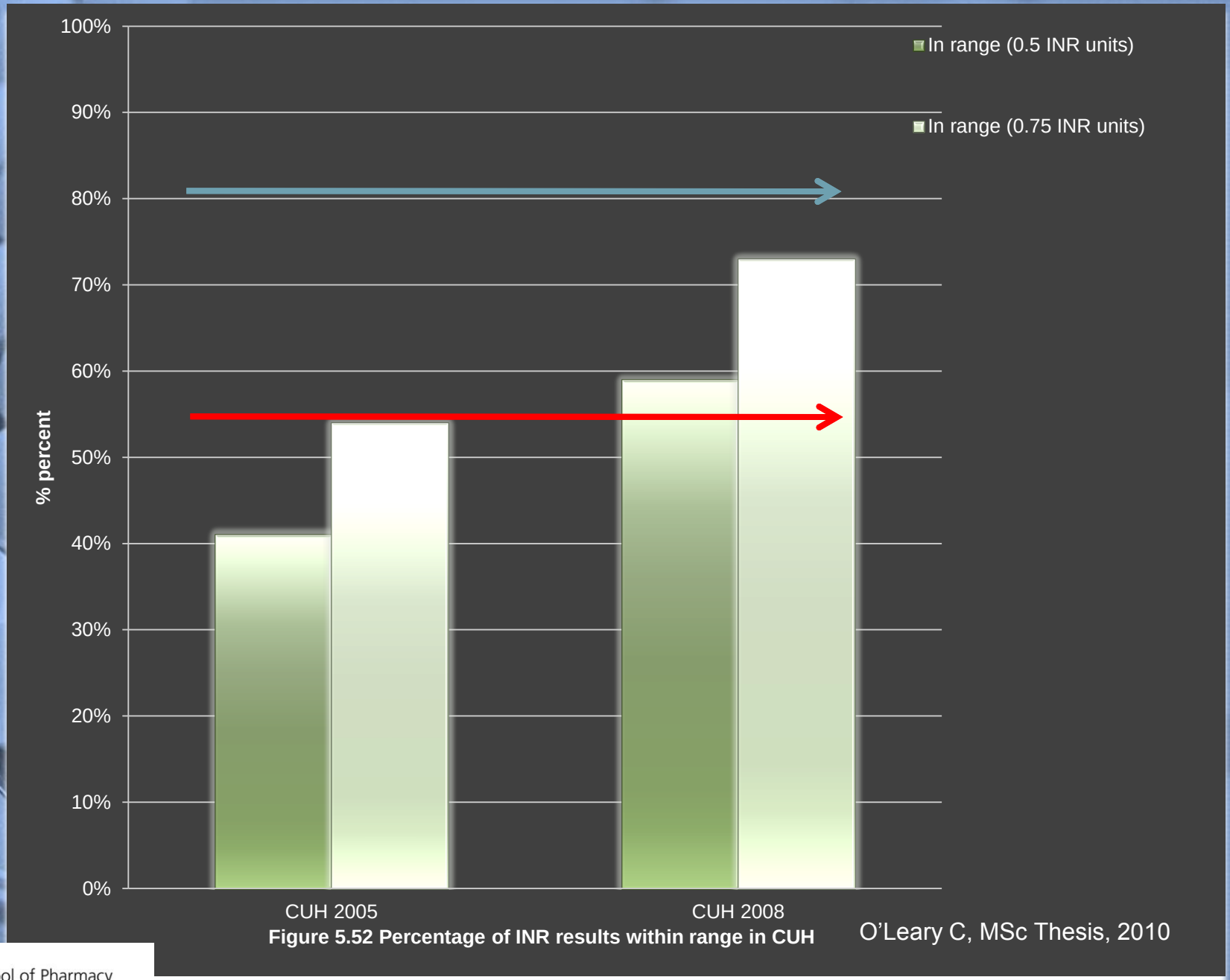

Figure 5.52 Percentage of INR results within range in CUH

O'Leary C, MSc Thesis, 2010

Clinical Outcomes of a Collaborative, Home-Based Postdischarge Warfarin Management Service

Leanne Stafford, Gregory M Peterson, Luke RE Bereznicki, Shane L Jackson, Ella C van Tienen, Manya T Angley, Beata V Bajorek, Andrew J McLachlan, Judy R Mullan, Gary MH Misan, and Luigi Gaetani

BACKGROUND: Warfarin remains a high-risk drug for adverse events, especially following discharge from the hospital. New approaches are needed to minimize the potential for adverse outcomes during this period.

OBJECTIVE: To evaluate the clinical outcomes of a collaborative, home-based postdischarge warfarin management service adapted from the Australian Home Medicines Review (HMR) program.

METHODS: In a prospective, nonrandomized controlled cohort study, patients discharged from the hospital and newly initiated on or continuing warfarin therapy received either usual care (UC) or a postdischarge service (PDS) of 2 or 3 home visits by a trained, HMR-accredited pharmacist in their first 8 to 10 days postdischarge. The PDS involved point-of-care international normalized ratio (INR) monitoring, warfarin education, and an HMR, in collaboration with the patient's general practitioner and community pharmacist. The primary outcome measure was the combined incidence of major and minor hemorrhagic events in the 90 days postdischarge. Secondary outcome measures included the incidences of thrombotic events, combined hemorrhagic and thrombotic events, unplanned and warfarin-related hospital readmissions, death, INR control, and persistence with therapy at 8 and 90 days postdischarge.

RESULTS: The PDS (n = 129) was associated with statistically significantly decreased rates of combined major and minor hemorrhagic events to day 90 (5.3% vs 14.7%; p = 0.03) and day 8 (0.9% vs 7.2%; p = 0.01) compared with UC (n = 139). The rate of combined hemorrhagic and thrombotic events to day 90 also decreased (6.4% vs 19.0%; p = 0.008) and persistence with warfarin therapy improved (95.4% vs 83.6%; p = 0.004). No significant differences in readmission and death rates or INR control were demonstrated.

CONCLUSIONS: This study demonstrated the ability of appropriately trained accredited pharmacists working within the Australian HMR framework to reduce adverse events and improve persistence in patients taking warfarin following hospital discharge. Widespread implementation of such a service has the potential to enhance medication safety along the continuum of care.

KEY WORDS: adverse drug events, community pharmacy services, international normalized ratio, patient discharge, warfarin.

Ann Pharmacother 2011;45:325-34.

Published Online, 8 Mar 2011, *theannals.com*, DOI:10.1345/aph.1P617

Warfarin is the most commonly prescribed oral anticoagulant worldwide and is likely to remain an important drug into the future, based on its proven efficacy and the lack of cost-effective alternatives for indications such as chronic atrial fibrillation.[1] Despite almost 60 years of clinical experience with its use, warfarin is still a major cause of adverse drug events and hospital admissions,[2-5] and optimal management remains a challenge. Warfarin-related hemorrhagic events[6,7] and thromboembolic events resulting from therapeutic failures[8,9] result in significant morbidity and mortality in individuals and substantial costs to the health-care system.[4]

A number of factors complicate warfarin management in the period following discharge from the hospital. Adverse event rates are intrinsically higher after warfarin initiation, with bleeding and recurrent thromboembolic events occurring more frequently.[7,10,11] The requirement for closer international normalized ratio (INR) monitoring early in therapy or because of destabilized postdischarge anticoagulant control[12] often represents a significant burden for patients with mobility or transportation problems.[13] Some pa-

Author information provided at end of text.

School of Pharmacy
University College Cork

Clinical Outcomes of a Collaborative, Home-Based Postdischarge Warfarin Management Service

Leanne Stafford, Gregory M Peterson, Luke RE Bereznicki, Shane L Jackson, Ella C van Tienen, Manya T Angley, Beata V Bajorek, Andrew J McLachlan, Judy R Mullan, Gary MH Misan, and Luigi Gaetani

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postdischarge. The PDS involved point-of-ca
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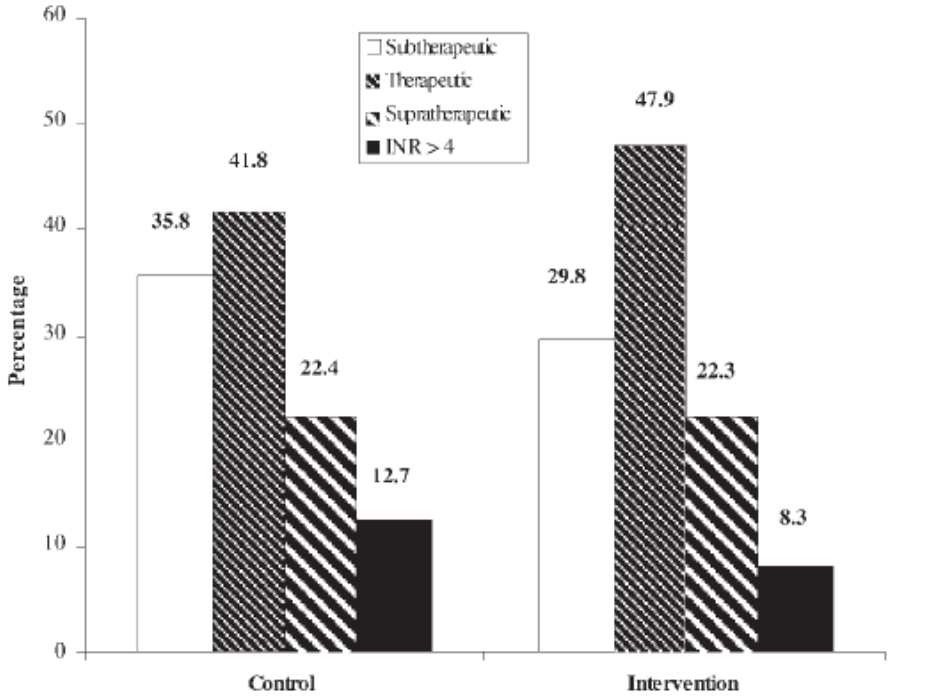

Figure 2. International normalized ratio (INR) results at day 8 for usual care and postdischarge service patients.

School of Pharmacy
University College Cork

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DOI 10.1007/s11239-011-0612-7

A retrospective assessment comparing pharmacist-managed anticoagulation clinic with physician management using international normalized ratio stability

Lauren Garton · Joseph F. Crosby

Published online: 28 June 2011

Abstract To assess the rates of therapeutic international normalized ratio (INR) levels between pharmacist-managed clinics compared to traditional physician-management and to determine the variation in rates of therapeutic INR levels between pharmacist-managed clinic data compared to physician-management. Retrospective, randomized, chart review. Referral only, outpatient, pharmacist based anticoagulation clinic under a community based tertiary care health system. Sixty-four patients with at least 1 year's worth of visits to the pharmacist managed clinic were reviewed for INR stability. The average percentage of visits within the defined therapeutic range, was 71.1% for the physician-managed group versus 81.1% for the pharmacist-managed group ($P < 0.0001$). The estimated variance in average therapeutic INR rates was double for the physician-managed group (365.7) versus the pharmacist-managed group (185.2) ($P = 0.004$). The pharmacist-managed anti-coagulation clinic had higher rates of INRs determined to be therapeutic and also exhibited significantly less variability in therapeutic INR rates relative to the physician-managed service.

Keywords Anticoagulation · Pharmacist managed · Pharmacist clinic · Outpatient clinic

Warfarin is currently one of two available oral anticoagulants in the US and is thought to be used by about 2 million patients for a variety of conditions including venous thromboembolism, atrial fibrillation (A-Fib), mechanical prosthetic heart valves, coronary artery disease, and stroke [1, 2]. Warfarin was discovered over 60 years ago and due to newer agents not being cost effective or not orally available, it still remains the mainstay of chronic anticoagulation therapy even with the variables associated with it [2, 3]. These variables include a narrow therapeutic margin, delayed onset of action, difficulty with reversal, many interactions with drugs, dietary effects, wide variation in sensitivity and the need for frequent laboratory monitoring [1]. The risk of major bleeding on warfarin is between 1 and 5% per year, and bleeding complications due to anticoagulants are among the most frequent adverse drug effects [1].

Warfarin inhibits factors II, VII, IX, and X as well as protein C and S [4]. The half-lives of these clotting factors vary in length allowing for warfarin initiation to put the patient in a hypercoagulable state on initiation [4]. Warfarin is unable to act on the circulating clotting factors which means it will take 4–7 days to become therapeutic [4]. Protein C is a natural anticoagulant and has a short

Cloyne Pharmacy Model

- A Community Pharmacy based anti-coagulant clinic in Cloyne Co. Cork
- Year 1
  - 342 INR tests completed
  - 250 in their therapeutic range (+/-0.1); **73.1%**
  - 84 (24.6%) outside their range but >1.5 or <5.0
  - 8 (2.3%) were <1.5 or > 5.0
- Year 2 to date
  - 263 INR tests completed
  - 201 in their therapeutic range (+/-0.1); **76.4%**
  - 58 (22.1%) outside their range but >1.5 or <5.0
  - 4 (1.5%) were <1.5 or >5.0

- “I used attend the Mercy Hospital in Cork. I wouldn't drive there myself. My daughter used take a half day off work and drive me there, wait for me, and then bring me home. There was also the cost of petrol and parking. Now, I can drive to Cloyne myself, not worry about traffic or parking and attend a fixed appointment and have it all done in a short timeframe”. ***Patient 22***

"I used to get up at 4am and drive 45 minutes to Cork University Hospital so that I would be first in the queue. The bloods would be taken at 8am, and the result would be back around 9am. I would then leave and get home close to 10am and go to bed. I found it a great trial due to the number of people attending. The Cloyne Clinic is stress free. Dermot makes an appointment, sticks to the appointment and I find it highly satisfactory". Patient 18

Other Opportunities!

Patient Education and Counseling 83 (2011) 295–302

Contents lists available at ScienceDirect

Patient Education and Counseling

journal homepage: www.elsevier.com/locate/pateducou

Asthma disease management—Australian pharmacists' interventions improve patients' asthma knowledge and this is sustained

Bandana Saini [a], Kate LeMay [a], Lynne Emmerton [b], Ines Krass [a], Lorraine Smith [a], Sinthia Bosnic-Anticevich [a], Kay Stewart [c], Deborah Burton [d], Carol Armour [a,e,*]

[a] Faculty of Pharmacy, The University of Sydney, Sydney, Australia
[b] School of Pharmacy, The University of Queensland, Brisbane, Australia
[c] Department of Pharmacy Practice, Monash University, Melbourne, Australia
[d] School of Biomedical Sciences, Charles Sturt University, Wagga Wagga, Australia
[e] Woolcock Institute of Medical Research and Faculty of Medicine, The University of Sydney, Sydney, Australia

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Knowledge
Self-management
Pharmacist

ABSTRACT

Objective: To assess any improvements in knowledge of asthma patients after a tailored education program delivered by pharmacists and measure the sustainability of any improvements. To ascertain patients' perceptions about any changes in their knowledge.
Methods: Ninety-six specially trained pharmacists recruited patients based on their risk of poor asthma control. A tailored intervention was delivered to patients based on individual needs and goals, and was conducted at three or four time points over six months. Asthma knowledge was assessed at the beginning and end of the service, and six and 12 months after it had ended. Patients' perceptions of the impact of the service on their knowledge were explored qualitatively in interviews.
Results: The 96 pharmacists recruited 570 patients, 398 (70%) finished. Asthma knowledge significantly improved as a result of the service (7.65 ± 2.36, $n = 561$, to 8.78 ± 2.14, $n = 393$). This improvement was retained for at least 12 months after the service. Patients reported how the knowledge and skills gained had led to a change in the way they managed their asthma.
Conclusion: Improvements in knowledge are achievable and sustainable if pharmacists used targeted educational interventions.
Practice implications: Pharmacist educational interventions are an efficient way to improve asthma knowledge in the community.

Journal of Public Health Advance Access published February 21, 2011

Journal of Public Health | pp. 1–5 | doi:10.1093/pubmed/fdr012

Cost analysis of a community pharmacy 'minor ailment scheme' across three primary care trusts in the North East of England

W. Baqir[1,2], T. Learoyd[1], A. Sim[1,2], A. Todd[1]

[1]School of Pharmacy, Health and Wellbeing, Sunderland University, City Campus, Chester Road, Sunderland SR1 3SD, UK
[2]Northumbria Healthcare Foundation Trust, Pharmacy, North Tyneside Hospital, Rake Lane, North Shields NE29 8NH, UK
Address correspondence to Wasim Baqir, E-mail: wasimbaqir@nhs.net

ABSTRACT

Background A large proportion of primary care medical consultations relate to minor ailments, placing a substantial burden on the UK National Health Service (NHS). In response, minor ailment schemes (MAS) have been introduced in several community pharmacies.

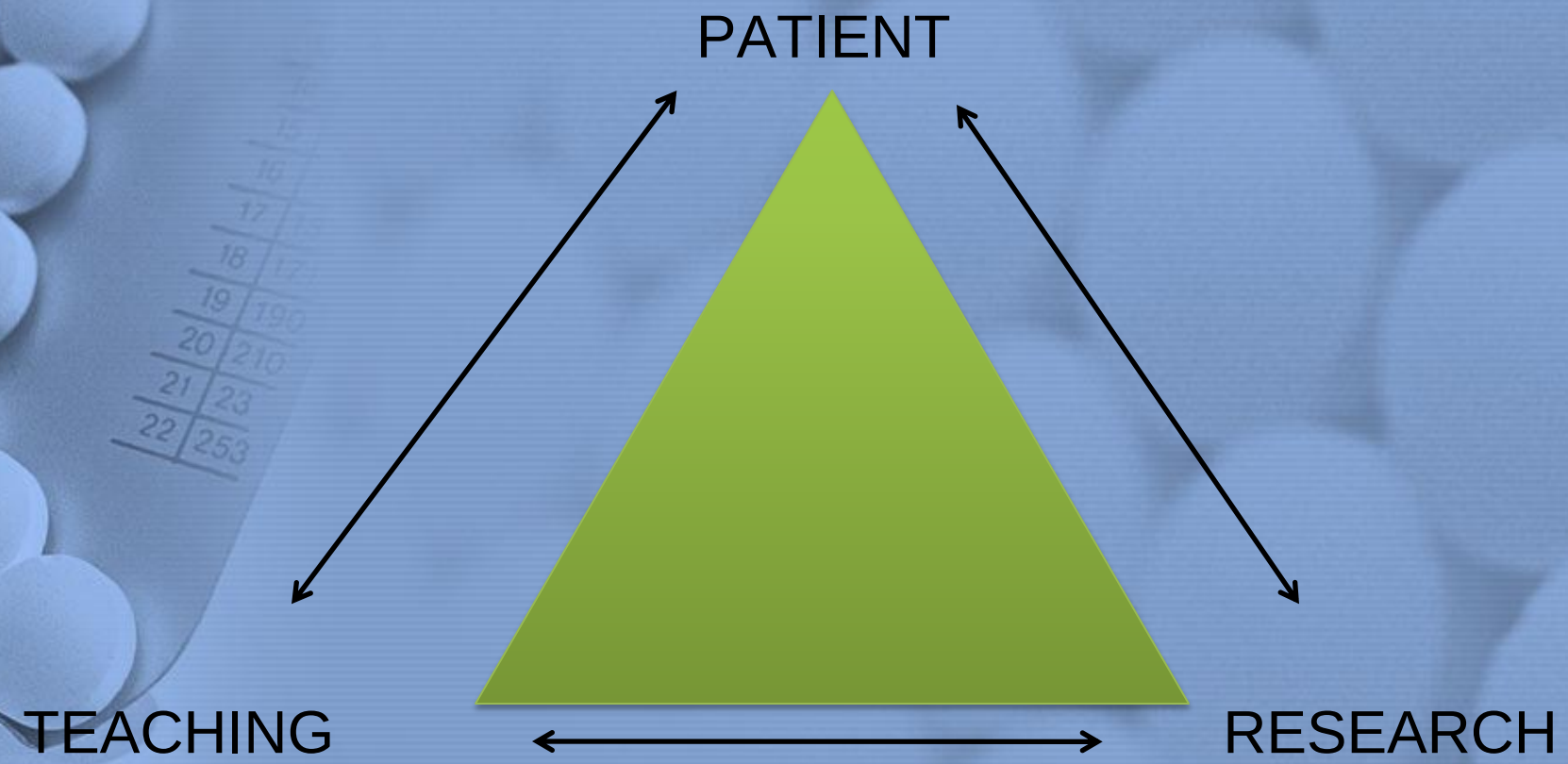
Methods Patients using MAS across three neighbouring primary care trusts were asked what action they would have taken if the MAS had not been in place. The net cost impact of the MAS was calculated using standard health-care reference costs. The observation period was one calendar month with annualized cost data.

Results During the observation period 396 patients used the MAS of whom 230 (58.1%) stated they would have made an appointment with their general practitioner (GP) if the MAS was not in place. A further 155 (39.1%) would have bought a medicine from the pharmacy. Other responses included attending the accident and emergency department at hospital ($n = 2$), consulting a health visitor ($n = 1$), or doing nothing ($n = 8$). The MAS is estimated to reduce local health-care costs by £6739 per month.

Conclusions MAS release NHS resources (especially in relation to GP consultations) by preventing (or minimizing) patient use of alternative and more costly branches of the NHS.

Keywords community pharmacy, enhanced service, minor ailments

Pharmacy as a patient-centred profession that has a positive impact on patient outcomes and healthcare costs



Motivation to Change

Strengths

Experts in medications

Willingness to expand role

Pharmacies the most accessible and visited part of the health service

Opportunities

Expanded Roles of the Pharmacist

- Pharmacovigilance
- Chronic disease management
- Medicine Reviews / Medicines Usage Reviews
- Preventative and screening services

Motivation to Change

Challenges

Opposition by other healthcare professionals
Competence and confidence

- Fear of new responsibilities, Risk aversion

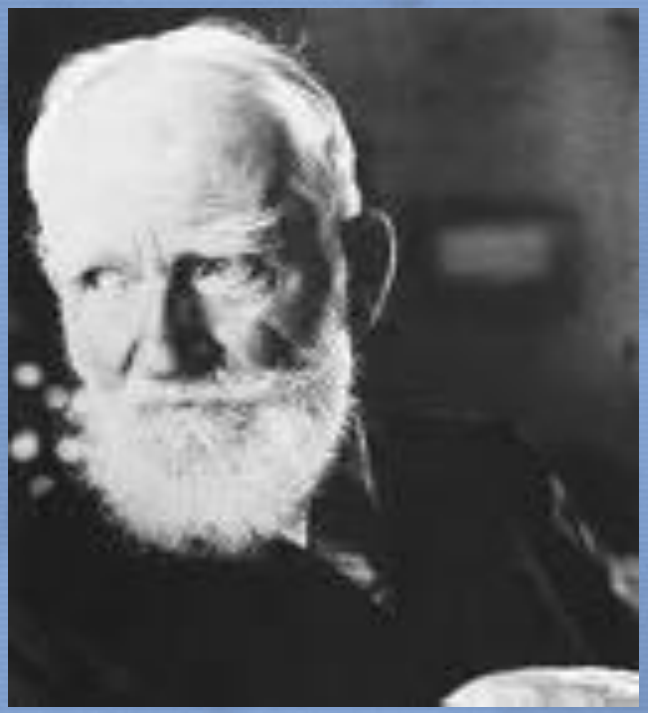
Threats

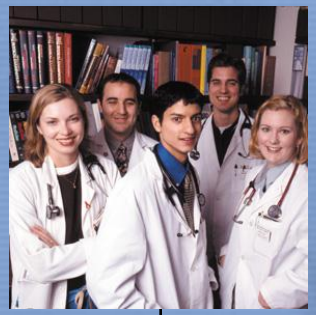
Economic climate
Lack of reimbursement for patient care services

Questions

“The single biggest problem in communication is the illusion that it has taken place.”

George Bernard Shaw





Optimal Pharmacotherapy for all

Optimisation of pharmacotherapy must be multi-faceted & patient-centred

Too much of a good thing
can be bad for you.