Collaborative care to optimise drug therapy in the elderly

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Structure

- What’s going on with drugs in the elderly?
- Why?
- How can it be improved?
  - Collaborative care involving
    - Multidisciplinary teams and geriatric medicine services
    - Clinical pharmacists, nurses
    - Patients
- Discussion
What’s going on?

- **Inappropriate prescribing**
  - 186 patients admitted to an acute geriatric unit (Spinewine et al., JAGS 2007)
    - Almost 60% of prescriptions: 1 inappropriate rating
    - 30% of patients were taking 1 drug-to-avoid
    - Under-prescribing in 50% of patients

- 50% of elderly patients do not take their drugs as intended
What’s going on?

- **Discontinuity of care**
  - 108 patients ≥ 75, readmitted to the ED 1 month after discharge (Witherington et al., Qual Saf Health Care 2008)
    - Readmission related to medication in 38% of cases
      - Preventable on 61% of cases
    - Preventable discharge communication gaps: 54% of patients

- **Economic consequences**
  - 1 € spent on drugs → 1.33 € spent to treat drug-related problems (Bootman, 1997)
### Why?

**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
- “One size fits all”: prescribing behaviour not tailored to the older patient

**Passive attitude towards learning**
- Anticipated inefficiency in searching for medicines information
- Reliance on being taught (teacher centred) rather than self directed learning

**Paternalistic decision making**
- Patients thought to be conservative
- Patients declared as unable to comprehend
- Ageism
- Difficulty in sharing decisions about treatment with other prescribers

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Spinewine et al., BMJ 2005; 331: 935-9
Why?

- Factors leading to a **better** use of medicines
  - Multidisciplinary team
    - Identification of drug-related problems by team members (nurse, physiotherapist,…)
    → communication to the prescriber
  - Input of geriatricians
    ↔ « one size fits all »

= COLLABORATIVE CARE
COLLABORATIVE CARE

- Multidisciplinary teams
  - Geriatric medicine services
- Collaboration with
  - clinical pharmacists
  - nurses
- Collaboration with the patient

- Educational approaches
- Collaboration with computers
Multidisciplinary approaches

Geriatric medicine services
Multidisciplinary approaches

Mainly in nursing home and ambulatory care settings
- Team members: usually GPs, nurses, pharmacists

Geriatric medicine services

- Acute care and outpatient clinics
- Team members: geriatricians, nurses, pharmacists, psychiatrists, ... with specialised geriatrics training
Can potentially address most causes of inappropriate use of medicines

Every team member brings specific competences
## Impact on appropriateness of prescribing

### Multidisciplinary approaches

<table>
<thead>
<tr>
<th>Study</th>
<th>Setting</th>
<th>Patients</th>
<th>Intervention</th>
<th>Duration</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allard et al. 1994</td>
<td>Ambulatory care, Quebec, Canada</td>
<td>266 patients</td>
<td>DRR by single interdisciplinary team (two physicians, one pharmacist, and one nurse) and written recommendations given to family doctor</td>
<td>12 months</td>
<td>P: The mean number of potentially inappropriate prescription (Quebec consensus panel: drug interactions, therapeutic overlapping, drugs of limited use) declined by 0.24 in the intervention group and by 0.15 in the control group (p=0.001); 37% of intervention patients had no team DRR, and those with team DRR were twice as likely to have fewer potentially inappropriate prescriptions.</td>
</tr>
<tr>
<td>Meredith et al. 1993</td>
<td>Healthcare homes, NY and LA, USA</td>
<td>259 patients</td>
<td>DRR by pharmacist and nurse to identify problems that were then presented to the physician</td>
<td>From 6 weeks to 90 days</td>
<td>P: Overall medication use improved for 50% of intervention patients and 38% of control patients (p=0.051); more duplicative drugs stopped in intervention group (p=0.003) and more appropriate cardiac drugs (p=0.017); no effect on appropriate prescribing of psychotropic drugs and NSAIDs (p=0.05; DUR criteria). O: No difference in clinical outcomes or health care use.</td>
</tr>
</tbody>
</table>

### Geriatric medicine services

<table>
<thead>
<tr>
<th>Study</th>
<th>Setting</th>
<th>Patients</th>
<th>Intervention</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Coleman et al. 1994</td>
<td>Nine primary care physician practices, USA</td>
<td>969 patients</td>
<td>Chronic care clinic including visit with geriatrician, nurse, and pharmacist</td>
<td>24 months</td>
<td>P: No significant improvements in the prescription of high-risk medications at 12 months (2.94 high-risk medications per patient in the intervention group vs 3.26 in the control group; p=0.57) and 24 months (1.86 vs 2.54, respectively; p=0.20). O: No difference in selected geriatric syndromes.</td>
</tr>
<tr>
<td>Schmader et al. 1995</td>
<td>11 Veteran Affairs hospitals and clinics, USA</td>
<td>834 patients</td>
<td>Multidisciplinary geriatric team care (including a geriatrician) for inpatients and outpatients (2x2 factorial design)</td>
<td>12 months</td>
<td>P: Higher improvements in the number of unnecessary drugs in intervention than in control patients (−0.6 vs +0.1, p&lt;0.0001), inappropriate prescribing (47% decrease vs 25% increase in MAI score, p&lt;0.0001), and number of conditions with underuse (−0.4 vs +0.1, p&lt;0.001) in inpatients. Higher improvements in the number of conditions with underuse in intervention than in control outpatients (−0.2 vs +0.1; p=0.0004). O: Decreased risk of serious adverse drug reactions in outpatients.</td>
</tr>
<tr>
<td>Saltvedt et al. 1996</td>
<td>Single Hospital, Norway</td>
<td>254 patients</td>
<td>Multidisciplinary geriatric team care (including a geriatrician) until hospital discharge</td>
<td></td>
<td>P: Lower prevalence of potential drug–drug interactions in intervention than in control group at discharge (p=0.009, 36% decrease from admission to discharge vs 17%, respectively), and of anticholinergic medications (p=0.03, 78% vs 10% decrease, respectively); no difference in prescription of Beers' drugs (p=0.05, 60% vs 33% decrease, respectively).</td>
</tr>
<tr>
<td>Crotty et al. 1997</td>
<td>Ten residential care homes, Australia</td>
<td>154 residents</td>
<td>Two multidisciplinary case conference (including a geriatrician), 6–12 weeks apart</td>
<td>3 months</td>
<td>P: Higher improvements in prescribing appropriateness in intervention than in control group (55% decrease vs 10% decrease in MAI scores, p=0.004). O: No differences in resident behaviour.</td>
</tr>
<tr>
<td>Strandberg et al. 1998</td>
<td>Ambulatory care, Finland</td>
<td>400 patients with CVD</td>
<td>Geriatrician-driven treatment review plus nutritional and smoking recommendations</td>
<td>3 years</td>
<td>P: Significant increase in the use of evidence-based drugs in the intervention compared with control group (β blockers p=0.02, ACE-I p=0.0001, ARA p=0.007, statins p=0.0001). O: Significant improvements in blood pressure and cholesterol levels, but no difference in major cardiovascular events and total mortality.</td>
</tr>
</tbody>
</table>

Less effective if

- No direct interaction with the prescriber
- Intervention not provided at the time of prescribing (retrospectively – after the prescription has been issued)
Acute geriatric unit

Geriatric day-clinic for outpatients

Mobile geriatric team for patients hospitalised on other medical/surgical units
Collaboration with clinical pharmacists
### Impact on appropriateness of prescribing

<table>
<thead>
<tr>
<th>Study</th>
<th>Setting</th>
<th>Sample Size</th>
<th>Intervention</th>
<th>Time</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hanlon et al.[1]</td>
<td>Veteran Affairs General Medicine clinic, USA</td>
<td>208 patients</td>
<td>DRR and written drug therapy recommendations for physician; patient counselling at each clinic visit</td>
<td>12 months</td>
<td>Higher decline in inappropriate prescribing scores (MAI) in intervention vs control group, at 3 months (24% vs 6%, p=0.0006), and 12 months (28% vs 5%, p=0.0002). No significant differences in adverse drug events, health related quality of life, or health services use.</td>
</tr>
<tr>
<td>Kriska et al.[2]</td>
<td>Ambulatory care, Scotland</td>
<td>332 patients</td>
<td>Pharmaceutical care plan completed and given to family doctor</td>
<td>3 months</td>
<td>More drug-related problems resolved in intervention than in control group (82.7% vs 41.2%, p&lt;0.05). No difference in health related quality of life or health services use.</td>
</tr>
<tr>
<td>Grotty et al.[3]</td>
<td>Hospital to nursing home, Australia</td>
<td>110 patients</td>
<td>Transfer medication list to community pharmacist, DRR by community pharmacist, and case conference with doctors and pharmacists</td>
<td>8 weeks</td>
<td>Scores of inappropriate prescribing (MAI) at follow-up lower in the intervention than in control group (2.5 vs 6.5, p=0.006); at follow-up, 22% decrease vs 91% increase, respectively. Better pain control and less hospital use; no difference in adverse drug events, falls/mobility, behaviour/cognition.</td>
</tr>
</tbody>
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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* ‡

300 patients admitted between November 2003 and May 2004

patients excluded (n=97)

Stratified randomisation

Control group: standard care (n= 100)

patients «lost» (n=5)

patients deceased (n=5)

Completed in-hospital phase (n=90)

Intervention group: standard care + pharmaceutical care (n=103)

patients «lost» (n=2)

patients deceased (n=5)

Completed in-hospital phase (n= 96)

3-month follow-up
- OR (95%CI) for having ≥1 improvement from admission to discharge in the intervention group compared with the control group
  - MAI 9.1 (4.2-21.6)
  - Drug-to-avoid 0.6 (0.3-1.1)
  - Underuse (ACOVE criteria) 6.1 (2.2-17.0)

- Trend toward decreased rates of mortality and visits to the emergency department
A Comprehensive Pharmacist Intervention to Reduce Morbidity in Patients 80 Years or Older

A Randomized Controlled Trial

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

- 400 patients ≥ 80y, 2 acute internal medicine wards (Sweden)
- Randomisation: usual care / ward-based pharmacists
- 12-month follow-up
Table 2. Summary of Outcomes at 12 Months’ Follow-up

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intervention Group (n=182)</th>
<th>Control Group (n=186)</th>
<th>Estimate (95% Confidence Interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visits to the hospital</td>
<td>266 (1.88)</td>
<td>316 (2.24)</td>
<td>0.84 (0.72-0.99)</td>
</tr>
<tr>
<td>Patients readmittedc</td>
<td>106 (58.2)</td>
<td>110 (59.1)</td>
<td>0.96 (0.64-1.46)</td>
</tr>
<tr>
<td>Readmissions</td>
<td>217 (1.54)</td>
<td>223 (1.58)</td>
<td>0.97 (0.81-1.17)</td>
</tr>
<tr>
<td>Drug-related readmissions</td>
<td>9 (0.06)</td>
<td>45 (0.32)</td>
<td>0.20 (0.10-0.30)</td>
</tr>
<tr>
<td>Visits to the emergency department</td>
<td>49 (0.35)</td>
<td>93 (0.66)</td>
<td>0.53 (0.37-0.69)</td>
</tr>
<tr>
<td>Overall survivald</td>
<td>0.69</td>
<td>0.67</td>
<td>0.94 (0.65-1.13)</td>
</tr>
</tbody>
</table>

Table 3. Drug-Related Readmissions

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

- Knowledge and skills
- Have full access to patients’ records
  - Past medical Hx, drug Hx, laboratory data, evolution,…
- See the patient/carer !
  - Drug history, compliance,…
- Communicate with other HCPs
  - Physicians, nurses, physiotherapists, community pharmacists,…
  - Work in close liaison, whenever possible
Pre-requisites / success factors

- If not...

**Does home based medication review keep older people out of hospital? The HOMER randomised controlled trial**

Richard Holland, Elizabeth Lenaghan, Ian Harvey, Richard Smith, Lee Shepstone, Alistair Lipp, Maria Christou, David Evans and Christopher Hand

*BMJ 2005;330;293; originally published online 21 Jan 2005;*

**Conclusions** The intervention was associated with a significantly higher rate of hospital admissions and did not significantly improve quality of life or reduce deaths. Further research is needed to explain this counterintuitive finding and to identify more effective methods of medication review.
Collaboration with nurses
Collaboration with nurses

- Interactive role in a multidisciplinary team
  - Administration and compliance: Identify patients with difficulties in medicines taking, poor compliance,…
  - Follow-up of prescription (side-effets, duration of therapy,…)

- Should be involved in educational programs
Collaboration with nurses

- **Nurse-physician communication and quality of drug use** (Schmidt et al., SSM 2002)
  - 36 Nursing homes in Sweden
  - Quality of drug use positively associated with
    - Quality of nurse-physician communication
    - Regular multidisciplinary team discussions
Collaboration with the patient / carer
"When we want your opinion, we'll give it to you"
Collaboration with the patient

- What does the patient want to know?
- How far does the patient want to be involved in the decisions relative to his/her medicines?
- Elicit patient’s preferences
- Don’t anticipate that the patient would disagree with changing one of his/her medicines
Collaboration with carers


- 1-yr prospective cohort study, 200 patients and family caregivers at a geriatric assessment center
- 46% of recommendations pertained to medications
- Caregiver agreement with recommendations predicted adherence to recommendation and goal attainment 1 year later
COLLABORATIVE CARE

- Multidisciplinary teams
  - Geriatric medicine services
- Collaboration with
  - clinical pharmacists
  - nurses
- Collaboration with the patient

Educational approaches
- Collaboration with computers
Educational approaches

- Passive vs interactive
- Academic detailing
- Audit and feedback

Advantages
- Directly addresses the absence of training in geriatric pharmacotherapy
- Can promote changes in prescribing
- Personalised, interactive, and multi approaches most likely to be effective

Disadvantages
- Usually restricted to specific drugs or diseases
- Passive approaches likely to be ineffective
- Effect not sustained without continued intervention
- Low participation rate; barriers to implementation of interactive and multidisciplinary meetings
« Collaboration » with computers

- **CPOE**: computerised prescribing order entry
- **CDSS**: computer decision support system

**Advantages**
- Potentially powerful tools to prevent adverse drug events
- Support at the time of prescribing
- All categories of inappropriate prescribing can be addressed, if prescription data are linked to clinical data

**Disadvantages**
- Challenging to implement
- Existing systems are not geriatric-specific
- High volume of alerts; therapeutic flags usually overridden by physicians; risk of unimportant warnings. Some prescribers are reluctant to use
Effect of Computerized Provider Order Entry with Clinical Decision Support on Adverse Drug Events in the Long-Term Care Setting

Gurwitz JH et al. JAGS 2008; 56: 2225-33

- Cluster RCT, 1118 residents, 29 care units
- CPOE with and without CDSS

- Alert burden
- Limited scope of the alerts
- Insufficient lab-clinical data integration
Additional thoughts

- The focus should be on the frail geriatric patient rather than on single diseases
- Transferability between countries/settings
  - Environmental factors
  - What works in acute care does not necessarily works in ambulatory care
  - What works in the US does not necessarily works in Belgium or in France, for example
Un(der)answered questions...

- Impact of collaborative care on clinical, economic, humanistic outcomes ↔ surrogate outcomes
- Cost-effectiveness?
- Patient’s empowerment – how to measure it? What is the impact?
- …
Thank you for your attention