Medicines use in nursing homes –
A Belgian survey

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Prescribing in Homes for the Elderly in Belgium

Initiated and granted by the Belgian Research Centre of Health Care
A collaboration between the Universities of Gent, Antwerpen and Louvain
• Most industrialized countries have a system of nursing homes for the care of institutionalized elderly.

• Belgium has 10.4 million inhabitants, 17% older than 65 and 1.5% living in nursing homes.

• The nursing homes are community-based, served by community pharmacies and GPs.

• The costs of care and of pharmaceutical care are rising in these institutions with concerns about polypharmacy.

• The Belgian government commissioned a healthcare services research study to a consortium of universities to investigate the situation.
Top 100 des médicaments (remboursés) utilisés dans les maisons de repos et les maisons de repos et de soins de Belgique, basé sur les DDD (daily defined dose) calculées (données de Pharmanet)

<table>
<thead>
<tr>
<th>ATC</th>
<th>Non-proprietary name</th>
<th>DDD</th>
<th>Health insurance cost (€)</th>
<th>Out-of-pocket (€)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>C01DX12</td>
<td>MOLSIDOMINE</td>
<td>10346605</td>
<td>3666181</td>
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<tr>
<td>2</td>
<td>A02BC01</td>
<td>OMEPRAZOLE</td>
<td>6580042</td>
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<tr>
<td>3</td>
<td>C03CA01</td>
<td>FUROSEMIDE</td>
<td>5349921</td>
<td>580875</td>
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<tr>
<td>4</td>
<td>C01DA02</td>
<td>NITROGLYCERINE</td>
<td>5229171</td>
<td>2196152</td>
</tr>
<tr>
<td>5</td>
<td>C08CA01</td>
<td>AMLODIPINE</td>
<td>4701052</td>
<td>2285735</td>
</tr>
<tr>
<td>6</td>
<td>N06AB04</td>
<td>CITALOPRAM</td>
<td>3980098</td>
<td>2759236</td>
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<tr>
<td>7</td>
<td>C09AA03</td>
<td>LISINOPRIL</td>
<td>3598074</td>
<td>732684</td>
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<tr>
<td>8</td>
<td>A02BA02</td>
<td>RANITIDINE</td>
<td>2928329</td>
<td>1465731</td>
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<tr>
<td>9</td>
<td>R05CB01</td>
<td>ACETYLCYSTEINE</td>
<td>2769150</td>
<td>328826</td>
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<tr>
<td>10</td>
<td>C03CA02</td>
<td>BUMETANIDE</td>
<td>2613340</td>
<td>314634</td>
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</table>
Objectives

To evaluate the quality of use of medicines in Belgian nursing homes

To evaluate the quality of prescribing and to explore the relationships with organisational characteristics
Interactive questions

- Who regularly works in a NH?
- Who has frequent direct contacts with HCPs working in NHs?

- Who has ever seen how medicines are prescribed in a NH?
- Who has ever seen how medicines are prepared and administered in a NH?

Quality of prescribing in NHs
What are the main issues, in your opinion?
Setting

- 3 Belgian provinces (2 Dutch- & 1 French-speaking)

- NHs eligible for selection if:
  - at least 30 beds
  - certification for high intensity care beds

- Stratified random sample:
  4 strata based on size (≤ 90 beds / > 90 beds) & type (public/private)

76 nursing homes
Method – sampling procedure

Stratified random sample of 76 nursing homes

Random sample of 3043 residents

Collection of 2501 medication charts = Administrative sample

Return from GPs 2031 completed medication forms

Exclusion: Incomplete data files
Patients in palliative care

1730 residents = Clinical sample
Method – Outcome measures

1. **Quality of medication management**
   - At the level of NH (n=75) and NH units
   - Structured questionnaires for NH directors and 1-2 head nurses
   - Results transformed in a “quality score”

2. **Quality of prescribing**
   - At the level of patients (n=2501)
   - Sources of information: administrative, prescription and clinical data
   - 3 sets of quality indicators used; sumscore calculated
1. PHEBE Project – Heymans Institute of Pharmacology – University of Ghent - Belgium

PRESCRIPTION

MEDICATION DELIVERY

MEDICATION STORAGE

MEDICATION PREPARATION

MEDICATION INFORMATION

DRUG FORMULARY

EVALUATION OF MEDICATION CHART

MEDICATION ADMINISTRATION

RESIDENT

HOSPITAL

ADJUSTMENT OF MEDICATION CHART AND FILE

PHARMACY

MEDICATION INFORMATION

AUTONOMY OF RESIDENT

PHEBE Project – A Spinewine – EAMA, Sion, 29.01.2008
1. Quality score for medication management

Development of a quality scoring system of the medication management system:

- Quality scores were developed for each topic of the questionnaire
- A team of pharmacists made a proposal
- An expert panel discussed this proposal
- Decisions were made by consensus
### Quality score for medication management

#### Example: Use of a therapeutic formulary

<table>
<thead>
<tr>
<th>Formulary</th>
<th>Response</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Formulary present</strong></td>
<td>Yes</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>-2</td>
</tr>
<tr>
<td><strong>New GP informed about formulary</strong></td>
<td>Systematically</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Sporadically</td>
<td>-1</td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>-3</td>
</tr>
<tr>
<td><strong>GP can prescribe non-formulary drugs without motivating</strong></td>
<td>Yes</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>+2</td>
</tr>
<tr>
<td><strong>Nurse points GP at prescribing non-formulary drugs</strong></td>
<td>Systematically</td>
<td>+3</td>
</tr>
<tr>
<td></td>
<td>Sporadically</td>
<td>+1</td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>0</td>
</tr>
<tr>
<td><strong>Formulary visibly present at prescribing place</strong></td>
<td>Yes</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>-2</td>
</tr>
<tr>
<td><strong>Formulary systematically (at every prescription) presented at GP</strong></td>
<td>Yes, to all GPs</td>
<td>+3</td>
</tr>
<tr>
<td></td>
<td>Yes, only to GPs receptive to it</td>
<td>+1</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0</td>
</tr>
</tbody>
</table>
Quality score for medication management

Example: Administration of medicines
Measures used

3 sets of validated indicators, specific for elderly patients:

- BEERS criteria
- ACOVE criteria specific to “underuse”
- BEDNURS criteria (Bergen District Nursing Home Study)

Completed with 2 other approaches of quality of prescribing:

- Chronic use of benzodiazepines
- Belgian medication with low benefit/risk ratio
Data collection

At institutional level (interview director and head nurses)
Quality of the Medication Management System (MMS)

Structured questionnaire → MMS quality score → Feedback report

n=76 nursing homes

At resident level (using BEERS, ACOVE, BEDNURS)
Quality problems of prescribing

Administrative data + Medication chart + GP: Clinical information

n=2501 residents
Results - sample

1. NHs

76 NHs participated.

Table: Comparison of basic characteristics of the sampled nursing homes with the population of Belgian nursing homes

→ The sample of nursing homes can be considered representative for the population of Belgian nursing homes.
Results – quality of medication management

- Quality coordinator designated in 84% of NHs
  - Quality book and written procedures in 82%
- Formulary in 95% of NHs
  - Used in 64% of NHs; non binding in 92%
- Prescriptions with computers in 89% of NHs
  - Computerised prescribing system in 1/3 of NHs
- No generic names in 71% of prescriptions
- Medicines ordered without prescription in 70% of NHs
Results – quality of medication management

- Medications were mainly purchased from community pharmacies (82.9%)

→ Only 50% of the pharmacists delivered medications as described by law: packaged per resident, with label on each box
Results – quality of medication management

Figure 3.5: Services provided by the pharmacy
Results – quality of medication management

• Prescription/OTC medicines in residents’ room: forbidden in 58% / 30% of NHs

• Several legal requirements in the preparation and administration of medicines were not met
  – Room with medicines unlocked
  – Medicines prepared more than 24hrs before administration
  – Preparation / administration by caring aids
  – Medicines removed from blisters upon preparation

• Crushing medicines: very frequent – information looked for in 21% of cases.
Quality scores at the level of the ward

- Information
- Administration
- Preparation
- Autonomie
- Storage
- Prescription sheet
- Communication
- Formulary
- Procedures
2. NH residents

- n=2510
- Mean age 84.8 y – 77% females
- Mean nb of clinical problems: 2.6 (0-12)
- 48% of residents: Katz Cd (full dependency and dement)
Figure 3.21: Number of medications per patient for chronic, acute, and “as needed” medication (N=2510)

N=20,275 prescriptions,
Per resident:
- Mean of 8.15 prescriptions
- Range: 0-22 prescriptions
Results – quality of prescribing

Figure 3.31: Consumption of chronic medication according to age

Figure 3.34: Relationship between polypathology and chronic medication
Results – quality of prescribing

**Beers criteria**

![Graph showing Beers Criteria: % of residents scoring on individual items (N=1,730).](image-url)
Results – quality of prescribing

ACOVE criteria
Results – quality of prescribing

**BEDNURS criteria**

% of patients prescribed:

- Several psychotropic drugs: 25%
- Antipsychotics, chronic use: 12%
- ACEI + potassium-sparing diuretic: 11%
Results – quality of prescribing

Quality problem score per resident

<table>
<thead>
<tr>
<th></th>
<th>ACOVE</th>
<th>BEDNURS</th>
<th>BEERS</th>
<th>DrugDrug</th>
<th>Benzo</th>
<th>Obsolete</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of residents with quality problem score</td>
<td>58%</td>
<td>65%</td>
<td>27%</td>
<td>5%</td>
<td>51%</td>
<td>8%</td>
</tr>
</tbody>
</table>
Results – quality of prescribing

- **Decreased quality of prescribing related to:**
  - Low number of residents per prescriber
  - Hainaut Province

- **Improved quality of prescribing related to:**
  - High activity of the coordinator
  - More intensive use of the formulary
  - Increased input of the dispensing pharmacist
Feedback for GPs

- CFOLAVIT 4.0 MG TABL 40 X 4.0 MG <= Standaard MppNmr <= MAG.
- C RISPERDAL COMP 60 X 2MG
- C LAXAVIT MICRO ENEMA INJ 3X12ML <= LAXAVIT MICRO ENEMA.
- Post Myocardinfect
  - Constipatie
  - Zeer mager
  - Dementie
  - Pall(1): niet fatale diagn.

- Hertalmie zonder ASA
- 34 crm gebruik van antiPsychotica
- 3 PostInfect zonder Betalblokk

- 2
- 0
- 0
- 3 CAT 0
- 0
- DPM
**Discussion**

- **Strengths**
  - Large and representative sample
  - The whole process of use of medicines was evaluated

- **Weaknesses**
  - Quality criteria
    - Validity of scores?
    - Non evaluated: dosage, indication, duration, …
    - Validity of clinical data not assessed
    - No evaluation of impact on clinical outcomes or quality of life
Discussion

- Polymedication is frequent.
- National effort to promote the use of therapeutic formularies, but better use needed.
- Nursing staff active to prevent errors, but low support from diverse information sources and from pharmacists.
- Quality of prescribing: potential problems in most residents.
- Limited involvement of pharmacists in quality activities.
Discussion

- Perspectives for improvement?:
  - Training nursing staff / prescribers
  - New procedures, and incentives to follow them
  - Patient empowerment?
  - Pharmaceutical care activities?
Similar data in the literature?

- Data on the quality of use of medicines in NHs
  - Data on quality of prescribing:
    - Quantity: ++
    - Quality: from +/- to ++
  - Data on the quality of medication management in general:
    - Quantity: - / +/-
Medicines use and ADEs in NHs (Gurwitz et al., Am J Med 2000; 109: 87-94)

- Prospective cohort study, 18 NHs (Massachusetts), 1 year
  - ADEs detected by stimulated self-report by NH staff and by periodic review of residents’ records by trained nurse and pharmacist investigators; then validated by a physician

- Results:
  - 546 ADEs; 51% preventable
  - At what stages of medicines use did errors occurred?
    - Ordering* 68% + monitoring (70%)
    - Administration 3%
    - Transcription 0.7%
    - Dispensing 0.5%

* mainly: wrong dose, drug interaction, wrong choice
Inappropriate prescribing in NHs – a few examples (1/3)

  - Retrospective study, 2.5 million US NH residents
  - 27.7% were prescribed an antipsychotic drug
    - 58.2% of prescriptions not in accordance with NH prescribing guidelines (mainly lack of indication and too high doses)
Inappropriate prescribing in NHs – a few examples (2/3)

- Fahey, BMJ 2003; 326:580-4
  - Controlled observational study, 172 NH residents + 526 community-dwelling elderly people (Bristol, UK)

What this study adds

Elderly people in one UK city receive inadequate care when judged against explicit quality indicators.

Those living in nursing homes receive poorer care than those living at home in terms of underuse of beneficial drugs, poor monitoring of chronic disease, and overuse of inappropriate or unnecessary drugs.
Inappropriate prescribing in NHs – a few examples (3/3)

- Finkers et al., J Clin Pharm Ther 2007;32:469-76
  - 5 Dutch NHs, 91 polypharmacy patients (≥9 medicines)
  - Team medication review: 1 hospital pharmacist + the patient’s NH physician; follow-up meeting 6 wks later
  - Mean of 3.5 problems identified / patient
    - 62%: unclear or not confirmed indication, or need for review

- At follow-up:
  - mean of 1.7 problems/ patient has been solved
  - Significant decrease in the number of drugs per patient
Similar data in the literature?

- Implementation of therapeutic formularies in NHs
  - Very limited international data
  - Aims:
    - Increased safety
    - Disposing of a list with the cheapest medications
    - Guide on evidence-based prescribing behaviour
  - Actual impact on quality?
Similar data in the literature?

• **Approaches for optimisation**
  - Restrictive prescribing rules, education, multidisciplinary/geriatric approaches, pharmaceutical care, computerised prescribing,…

• **The Australian model** (Roughead et al., Drugs Ageing 2003; 20:643-53)
  - 1991-2002: development of services supporting appropriate medications management, eg:
    - Federally funded medication review services / CPS
    - Medication advisory committees
    - 50% of Australien pharmacies registered to provide services
  - **Impact:**
    - ↓use of BZD, laxatives, NSAIDs, antacids
    - ↓ Error rates during medication administration
Final thoughts

- The quality of prescribing in NHs is an important issue but... other areas of medicines use also need to be evaluated... as optimal therapeutic outcomes will only occur if the whole process of medicines use is optimised.

- Close collaboration with nurses is essential
  - And spending a day or half a day « shadowing » them would certainly be very informative to prescribers.

- And of course... it is not because the patient is in a NH that he can’t give his/her point-of-view!