

Organization of the Medication Management Process in Belgian Nursing Homes

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Background: With the increase of the proportion of old (>80 years), frail people living in long-term care settings, concern about the quality of medication management processes in nursing homes is growing.

Objectives: To characterize the organization of medication management processes in Belgian nursing homes.

Method: This cross-sectional, observational study of a representative sample of 76 Belgian nursing homes was performed in November and December 2005. The results are based on structured interviews that were conducted with 76 facility directors and 112 head nurses, using 2 questionnaires.

Results: A self-reporting medication error system was set up in 69.7% of the nursing homes. Almost all nursing homes had a therapeutic drug formulary, but its use was not compulsory. Medications were mainly

delivered from a community pharmacy (82.9%). The role of the pharmacist was often restricted to mere delivery of medications. Medications were not always administered by nurses, but also by care aides (67%) or nursing students (12.5%). The practice of *postscription* (i.e., prescribing medication after it has been dispensed by the pharmacist) was also found to be quite common (69.9%).

Conclusion: This study provides a detailed description of the organization of medication management processes in Belgian nursing homes. Based on these results, problem areas can be identified and, consequently, targeted improvement actions can be investigated and implemented. (*J Am Med Dir Assoc* 2011; 12: 308–311)

Keywords: Nursing homes; quality management; medication

In recent years, there has been growing concern about medication safety and quality of medication management in nursing homes¹; however, little attention has been given to organizational aspects of the medication management process in long-term care settings. The medication management pro-

cess includes medication prescription; medication purchase, storage, distribution, and administration; and ends with follow-up of pharmacotherapy.

Today, 1.2% of the Belgian population resides in a nursing home but these numbers are expected to increase in the

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future.^{2,3} Most Belgian nursing homes do not specialize in specific illnesses and accept residents with a wide range of medical problems. Residents are still treated by their general practitioner (GP). Each nursing home is required to appoint one GP as medical coordinator. His function is to coordinate and monitor the quality of medical care in the facility but without power to overrule residents' personal GPs.

Several studies have focused on improving the quality of prescribing in nursing homes with medication reviews^{4–6} or computerized physician order entry systems.^{7,8} Other studies have investigated the administration step, identifying medication errors, as well as their clinical consequences.^{9–11} However, we found no information on the overall organization of the medication management process in nursing homes. Therefore, observational data about the current status of medication management processes in nursing homes are needed for the development of targeted quality improvement actions in this setting.

The aim of this cross-sectional, observational study was to provide a detailed description of the organization of medication management processes in Belgian nursing homes.

METHOD

Design

This study, performed in November/December 2005, was a cross-sectional, observational study of a representative sample of Belgian nursing homes and part of a larger study: the Prescribing in Homes for the Elderly in BELgium (PHEBE) study, funded by the Belgian Health Care Knowledge Center (KCE), and requested by the Belgian government. Its aim was to provide decision makers with information so as to introduce policy changes in health care for older adults. The study was carried out by a consortium of 3 universities: University of Louvain-la-Neuve (UCL), University of Antwerp (UA), and Ghent University (UGent). Ethical approval was granted by the Ethical Committee of the Scientific Research Institute for General Practitioners.

Sample

In Belgium, 1015 homes for older adults (ie, residential homes and nursing homes) were registered in 2004, of which 970 were nursing homes with at least 30 beds. Smaller nursing homes typically provide residential housing and no nursing care; therefore, a cut-off of 30 beds was chosen. Of these 970 nursing homes, 426 were located in the participant provinces (Antwerp, East-Flanders, and Hainaut). These were stratified by size (small or large facility: cut-off 90 beds, the mean number of beds in the subgroup), and type of funding (public versus private). Random samples were taken within these strata for the final sample with refusals being replaced by a new random selection within the same strata. The final sample consisted of 76 nursing homes. Two different wards were included per nursing home whenever possible. A ward was defined as a group of patients for which one head nurse was responsible. This resulted in a sample of 112 wards.

Data Collection

Structured interviews were conducted by pharmacists and pharmacy students, using a questionnaire developed by a multidisciplinary panel of nurses, pharmacists, GPs, and a nursing researcher involved in the research consortium.

The questionnaire consisted of a section for the facility director and a section for the head nurse of a ward. The first part addressed mainly administrative and policy issues: medication management policy, agreements concerning the prescription of medication, and medication delivery. The second part addressed practical aspects of the medication management process: prescription, medication delivery, records, storage, preparation, administration, and information.

The questionnaire was pretested in 5 nursing homes that were not part of the final sample. Questions were evaluated for clarity and adapted where needed. The questionnaires were translated from Dutch into French by 2 members of the research team, with back-translation for validation. The full questionnaire is available on request.

Data Analysis

Each nursing home was assigned a unique identification number used to match questionnaire responses with administrative and resident data obtained later in the overall PHEBE study, to provide feedback at the end of the study, and to maintain anonymity. Descriptive statistics were obtained using SPSS (version 17.0, SPSS, Inc., Chicago, IL).

RESULTS

Characteristics of the selected nursing homes are shown in Table 1.

The facility directors of all included nursing homes (n = 76) and the head nurses of all selected wards (n = 112) answered the questionnaires. Mean time spent on the interviews was 1 hour and 24 minutes.

Medication Management Policy

In 88.2% of the nursing homes a quality coordinator was appointed, responsible for the overall quality of services in the facility (including for example medical care as well as hotel services), and contributing to the quality of standard

Table 1. Characteristics of the Sample

Characteristic	
No. of selected nursing homes	76
No. of beds, mean (range)	106 (35–306)
No. of visiting general practitioners, mean (range)	32 (7–115)
Resident/nursing staff ratio, mean (range)	3.2 (2.0–6.2)
No. of wards	112
Open, mixed wards,* n (%)	82 (73.2)
Closed wards,† n (%)	14 (12.5)
Closed, mixed wards,‡ n (%)	12 (10.7)
Open wards,§ n (%)	4 (3.6)

* Open wards, for all types of residents, including residents with dementia.

† Closed wards (ie, residents cannot exit the ward) only for residents with dementia of behavioral problems.

‡ Closed wards for all types of residents.

§ Open wards only for cognitively fit residents.

operating procedures (SOPs). These SOPs are gathered in a quality handbook, a requirement for each Belgian nursing home.

A self-reporting medication error system, recording all reported medication errors throughout the entire nursing home, was set up in 69.7% (53/76) of the nursing homes. In most of these (48/53), a reported error resulted in actions taken to prevent the error in the future. The nature of these interventions was not recorded.

One in 5 (21.1%) nursing homes evaluated the medication management process for failures, errors, and so forth at least every 6 months, 39.5% of the nursing homes performed such evaluation annually, whereas 39.4% evaluated the medication process less than once a year.

Prescription Practice, Medication Delivery, and Storage

Almost all nursing homes (94.7%) had a therapeutic drug formulary (a guide to evidence-based prescribing in older adults), the presence of which is legally mandated (Table 2). In 91.1% of wards it was not binding, meaning that GPs could prescribe nonformulary drugs without having to justify their choice. Prescriptions were translated into medication records in all nursing homes but records were computer-generated in only 78.6% of wards (Table 2). In about two thirds (69.6%) of the wards, nurses did not always wait for a prescription before ordering chronic medication, implying that the GP had to prescribe the medication *after* it had been delivered by the pharmacist (so-called *postscription* practice). Nursing homes purchased their medication primarily from a community pharmacy (82.9%) with most (63.4%) purchasing from only one pharmacy (Table 2). For nursing homes working with more than one pharmacy, medication was delivered by turns (81.8%) or simultaneously

Table 2. Prescription Practices

Characteristic	N	%
Therapeutic drug formulary		
Present in nursing home	72/76	94.7
Present on the ward	102/112	91.1
Used by the GPs	65/102	63.7
Electronic prescribing system		
Implemented in the nursing home	24/76	31.6
Formulary available electronically	11/24	45.8
Formulary drugs first choice	8/24	33.3
Translation of prescriptions into medical records (wards)		
Computer-generated	88/112	78.6
Handwritten	24/112	21.4
Postscription*	78/112	69.6
Medication purchase		
Community pharmacy	63/76	82.9
1 pharmacy	40/63	63.4
2–3 pharmacies	18/63	28.6
> 3 pharmacies	5/63	7.9
Hospital pharmacy	10/76	13.2
Drug wholesaler	3/76	3.9

GPs, general practitioners.

* Practice of prescribing medication by GPs after delivery by pharmacists.

Table 3. Pharmacy Services Provided to the Nursing Homes

Service	n (%)
Medication delivery	76 (100)
List of the delivered medication	72 (94.7)
Provision of drug information	48 (63.2)
Consultation with NH board about the MMS	32 (42.1)
Spontaneous advice about the MMS	29 (38.2)
Assistance in the evaluation of the MMS	20 (26.3)
Checking expiration dates of the drugs	9 (11.8)
Other services (eg, management of emergency kit)	21 (27.6)

NH, nursing home; MMS, medication management system.

(18.2%) by the different pharmacies. The different services offered by the delivering pharmacists are displayed in Table 3.

Medication Preparation and Administration

On all wards, nurses were responsible for medication administration; however, the interviewed head nurses stated that medication was also administered to the residents by care aides (67% of the wards) or nursing students (12.5% of the wards).

On almost every ward (99.1%), medications were crushed when needed (mainly to facilitate swallowing). Nurses consulted information before crushing in 21.4% of the cases. When the nurses did consult information sources, they consulted the medical coordinator (64.3%), the pharmacist (33%), or the medicines' package inserts (29.5%).

DISCUSSION

The aim of this study was to provide a detailed description of the organization of medication management processes in Belgian nursing homes so that improvements could be suggested. Hereby, one should be aware that the resources are scarce in long-term care, raising the need for simple and low-cost strategies.

First, despite the opportunity to identify bottlenecks in the process, medication errors that were made in the past, and staff concerns about the quality of medication use, almost 40% of the nursing homes performed an *evaluation of the medication management process* less than once a year. A frequent, at least annual, proactive evaluation of the medication management process, involving all stakeholders (quality coordinator, medical coordinator, nursing home board, nursing staff, and delivering pharmacist) is recommended.¹² The team should routinely analyze external information concerning errors and patient safety issues to determine the need for change.¹³

Second, the *role of the pharmacist* is often limited to delivery of medication, and could be expanded. In Anglo-Saxon countries (United States, Australia, United Kingdom), pharmacists perform medication reviews to improve the quality of prescribing, with a positive impact.^{14–16} As medication specialists, pharmacists can also educate the nursing home staff about medication-related topics.¹⁷

Third, almost one fifth (21.4%) of the nursing homes in our study still worked with handwritten medication records and only one third of the facilities were equipped with an electronic prescribing system. *Computerization* would offer a great

potential for improvement.^{18,19} Transcription of handwritten medication orders is a potential source of errors,¹⁴ and clinical information technology could also facilitate the management of chronic conditions and support the delivery of effective patient care.

Fourth, multiple GPs visit the nursing homes, each of them having their own prescription pattern. A uniform prescription pattern could improve the nursing staff's knowledge about the medications that are used and potentially reduce errors. The implementation of the legally mandated *therapeutic drug formulary* (specifically tailored to the needs of older patients) and the obligation to preferentially prescribe the drugs in the formulary, is a simple and inexpensive intervention. Another solution would be to have one dedicated GP responsible for all prescribing.

A fifth important concern is the frequent practice of “*post-script*,” in which the GP is asked to prescribe medication after it has already been ordered and delivered. The practice is actually not concordant with the law because pharmacists always need a prescription before dispensing medications. GPs should be made aware of the problem and asked for a sufficient number of prescriptions covering the period until their next scheduled visit.

Sixth, medication administration is not always performed by a *trained nurse*. The literature has shown that even trained nurses still lack some knowledge about medication administration.²⁰ As stated before, education of nursing staff could be a task for the delivering pharmacist.¹⁷

Last, even though medications are crushed in all the wards, nurses checked the *crushability* only in 21.4% of the cases. The crushing of dosage forms can alter the release pattern and efficacy of the drug²¹; therefore, it is important to raise nurses' awareness on the clinical and economic consequences of crushing.

Our study had some limitations. The results are based on face-to-face interviews and, therefore, some answers might not have been truthful; however, investigators explained clearly to each interviewee that their interest was purely academic and nonpunitive. Inter-rater variability was not evaluated for the questionnaires; however, most questions were closed questions with yes and no answers, without ambiguity. Finally, our study was purely descriptive and did not evaluate the correlation between the medication process and potential medication (administration) errors or adverse drug events.

Our study had several strengths. When compared with the population of Belgian nursing homes, our sample was found to be representative.²² The structured questionnaires were easy to use and understand, the medication management process could be evaluated in less than a few hours using this tool, and the results allowed identification of problem areas in the entire medication management process.

CONCLUSION

In summary, this study provided an overview of the current practical organization of the medication management process in Belgian nursing homes. The results of this study were communicated to the KCE and to the Belgian government, and

a feedback report was sent to all participating nursing homes. Actions will therefore be taken both at a national and local level. The findings make it possible to undertake specifically targeted quality improvement actions.

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