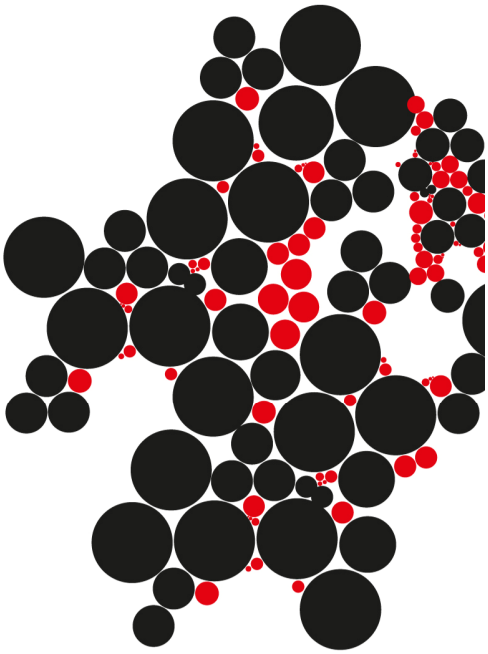
MASTER THESIS



# MEDICATION PRESCRIPTIONS OF RESIDENTIAL HOME PATIENTS COMPARED TO NURSING HOME PATIENTS

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# INDEX

## INTRODUCTION

This master thesis is the result of the graduate research I have conducted during the past seven months, within the framework of the master Health Sciences at the University of Twente. I am Marjon Versteeg and I have followed the specialization track Health Service and Management. Before this master I have finished the higher professional education in nursing. After finishing the compulsory courses of the master, I started searching for suitable assignments. For this master thesis I wanted to discuss a topic that was interesting for me as a nurse, and after some research into existing assignments I came, together with my supervisor Dr. J.G. van Manen, in contact with health care organization Carintreggeland for a possible assignment for my master thesis. In consultation with Mr. Snijders we arranged a meeting with a pharmacist who might have an interesting research topic. The medication prescriptions of general practitioners and nursing home physicians drew the attention of pharmacist Riemersma. He thought there might be differences within the medications prescribed to residential home patients compared to nursing home patients, but he could not identify these differences. Foregoing observation led to the research topic of this master thesis: 'Medication prescriptions of residential home patients compared to nursing home patients'. Different studies have demonstrated that there are differences in the medications prescribed to nursing home patients compared to residential home patients. These same studies were not able to detect specific causes of the differences found. Therefore the second part of this master thesis is used to study factors that might influence the medication prescriptions of physicians to elderly patients.

Conducting this study and creating this master thesis would not have been possible without the help of supervisors from the university of Twente: Jeannette van Manen and Maarten IJzerman. Thank you for guiding me through this master thesis. I would like to thank Henk Snijders, doctor, strategist/innovator at Carintreggeland for everything he has arranged for this master thesis and for the provision of information. He played an important role in establishing this research project for my master thesis. Special thank to pharmacist Gustaaf Riemersma, who is the inventor of the subject of this master thesis. He has provided lots of assistance during the whole research period and especially during the period of data collection. In addition I would like to thank all other, not mentioned persons for all the help, assistance and information they gave me during this past seven months. Without the help of all above mentioned persons, a successful outcome of this master thesis would not have been possible.

## MASTHER THESIS IN THE FORM OF A JOURNAL ARTICLE

# Medication prescriptions of residential home patients compared to nursing home patients

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## ABSTRACT

**Background:** Polypharmacy, the prescription of multiple medications and the prescription of potential inappropriate medications (PIMs) seem to be highly prevalent in elderly patients and are often associated with adverse drug events. Polypharmacy and PIMs seem to occur more often in elderly with medications prescribed by general practitioners, compared to elderly with medication prescribed by nursing home physicians. In this study possible differences in the medications prescribed to residential home and nursing home patients were studied and factors influencing medication prescriptions to elderly were investigated.
**Methods:** A descriptive comparative study was conducted to explore possible differences in the medications prescribed to residential home patients and nursing home patients. The medication prescriptions were examined for the presence of polypharmacy, the number of medications prescribed and the number of PIMs prescribed. Factors influencing medication prescriptions of nursing home physicians and general practitioners to elderly patients were investigated by a questionnaire filled out by the concerned physicians.
**Results:** The medication prescriptions of 21 nursing home patients and 37 residential home patients were analyzed. In complex patient groups, patients with intensity of care package (ZZP) $\geq 3$ and the number of co morbidities $\geq 3$, and patients with ZZP $\geq 4$ and the number of co morbidities $\geq 3$, the mean number of medications prescribed per patient was significantly higher within the residential home patients, compared to the nursing home patients ($p$ = respectively .012 and .009). In the complex patient groups, significantly more residential home patients had polypharmacy compared to the nursing home patients. No significant differences were found in the prescription of PIMs between the nursing home patients and the residential home patients. The number of PIMs prescribed was significantly related to the number of medications prescribed. Almost half of the physicians seemed to have reasons to be more likely to prescribe medications when it concerned an elderly patient, and when a patient wanted to get medications prescribed. None of the physicians intensively used the STOPP criteria.
**Conclusions:** Medication prescribed to residential home patients at certain points significantly differ from medication prescribed to nursing home patients. Because of the small sample, but significant relevant differences found in this study, it would be interesting to conduct a similar but larger study in The Netherlands investigating differences in medications prescribed to residential and nursing home patients. In this study, no final answers could be given about factors causing the differences found in the prescribed medications. It is not known whether geriatric training, experience and/or criteria/guidelines reduce the prescription of multiple medications, PIMs and polypharmacy to elderly patients, therefore more research should be conducted to study these factors in Dutch nursing homes and residential homes.

**Keywords:** *nursing home, residential home, polypharmacy, potential inappropriate medication*

## INTRODUCTION

Elderly people often have multiple disorders which entail pharmaceutical interventions. Changes in pharmacokinetics are present in most elderly people, which can lead to an increased likelihood of harmful interactions between medications (1, 2). Polypharmacy, the use of several drugs at the same time to treat different disease processes, and the prescription of potential inappropriate medications (PIMs) are highly prevalent in elderly people and are often associated with adverse drug events (ADEs) (3-7).

A medicine can be considered to be potentially inappropriate when alternatives are safer or more effective and when the risk for additional side effects is higher than the expected benefits (4). Around 12% of the patients living at home and

40% of the patients in nursing homes are facing prescription of PIMs (3). A Spanish study of García-Gollarte, Baleriola-Júlvez (4) found that 79% of their sample had prescribed at least one PIM. According to van der Hooft, t Jong (8) the one-year risk for elderly in The Netherlands of receiving at least one inappropriate medicine is around 20%. The prescription of multiple medications increasingly occurs in Dutch residential and nursing homes and in 89% of the cases irrational combinations of medications are prescribed (2).

Polypharmacy and PIMs can have multiple consequences, including ADEs, drug related problems and drug-drug interactions (6, 9-12). Finkers, Maring (6) found that 96% of the patients with polypharmacy had one or more drug-related problems. An ADE can be defined as an unintended health outcome that is caused by medication management rather than by the disease process (13). The incidence for preventable ADEs seem to be significantly higher in elderly patients (age $\geq$ 65) compared to non-elderly (13). It is claimed that taking two different drugs gives a 13% risk of ADEs. When using four drugs, the risk of ADEs rises to 38% and when using seven or more drugs at the same time, the risk of ADEs is 82% (3). Because of the risks related to polypharmacy, these patients need more and longer medical consultations compared to people using fewer medications (9, 10).

Avoiding the occurrence of polypharmacy and potential inappropriate and unnecessary drugs is important to reduce the prevalence of medication- related problems and ADEs in elderly patients (11, 14). It is therefore important to understand factors influencing the medication prescriptions of physicians. Several factors have been found that influence the prescribing behavior of physicians. In a study in 2009 it was found that physicians take several criteria in consideration when prescribing medications. Physicians seem to take the recommended daily dose and the patient preferences into account (15). Physicians more often seem to prescribe medications when the patient expects medications then when the patient has no expectations, and physicians are even more likely to prescribe medications when they themselves think the patient expects to get medications prescribed (16, 17). Physicians critically judge their treatments for individual patients when they derive individual pharmacological feedback, and pharmacotherapy consultations to discuss medications improve the quality of medication prescriptions (17-19). When physicians use quality criteria by means of guidelines for the prescription of medications, medications can be prescribed more safe and adequately (19). Other factors influencing the prescribing pattern of specialists, are beliefs about the efficacy, safety and tolerability of drugs. Finally, marketing strategies of pharmaceutical companies seem to contribute to differences in medication management (20).

Several studies indicate there are differences between physicians in the medication prescriptions to elderly patients. Physicians based in nursing homes prescribe on average fewer medications per elderly patient per year than physicians with office-based practices (21). Monroe, Carter (22) conducted a study in a nursing home and found that not geriatric trained physicians provided on average twice as many drugs per patient compared to geriatric trained physicians. The odds of being prescribed nine or more medications and the odds of being prescribed a PIM are higher within not geriatric trained physicians (22).

Schols, Crebolder (23) showed that general practitioners and other consulting physicians have not enough time and experience to provide the quality of care elderly patients require (23). The assumption has been that patients from general practitioners more often have polypharmacy and have more PIMs prescribed than patients from nursing home physicians because of the possible multiple prescribers and the absence of one final responsible person for all the medications of the patient (22, 23). A study in The Netherlands argued there is a big difference between the guidelines for the prescription of medications and the clinical practice of prescribing medications (8). According to Monroe, Carter (22), geriatric educated physicians follow guidelines and standards for geriatric patients more closely. All of these factors could influence the prescription of PIMs and multiple medications to elderly patients.

The study of Monroe et al. recommend pharmacological training for physicians who prescribe medications to elderly patients, geriatric specialization, and they recommend the use of guidelines like the Beers or the STOPP/START criteria (22). These criteria help to alert the physician to serve the right treatment when prescribing medications (22). STOPP stands for 'Screening Tool of Older Peoples' potentially inappropriate Prescriptions' (24). Both the STOPP and the Beers criteria include a

list of criteria for potential inappropriate medications that should not be prescribed to elderly patients and/or in specific situations (22, 25). The Dutch Multidisciplinary Guideline Polypharmacy in the Elderly 2012 advises to use the Dutch version of the STOPP criteria to support the choice for the best medications for elderly, because the PIMs by the STOPP criteria are most associated with ADEs, and the STOPP criteria are most in line with the Dutch healthcare system (3, 24-26).
Multiple studies indicated there are differences in the prescribing behavior of general practitioners compared to nursing home physicians. More research is required to learn whether these differences also exist in The Netherlands. Because prescribing multiple medications and prescribing PIMs entails risks of ADEs, more research should be conducted to investigate whether there are differences in the presence of polypharmacy and PIMs in the medications prescribed to nursing home patients and residential home patients.
Previous studies argue that geriatric education and more or less carefully following guidelines are possible reasons for differences in the medications prescribed to nursing home and residential home patients (21, 22). Extensive research into causes of possible differences in the medications prescribed to nursing home and residential home patients has not been carried out in The Netherlands yet. More extensive research is needed to study factors influencing the medication prescriptions of physicians to elderly patients in The Netherlands. Foregoing information leads to the following two research questions that will be addressed in this study:

1. *Are there differences in the prescription of potential inappropriate medications to and the presence of polypharmacy in patients living in a residential home, compared to patients living in a nursing home?*

2. *Which factors play a role in the medication prescriptions of general practitioners and nursing home physicians to elderly patients?*

## METHODS

A descriptive comparative study was conducted to investigate possible differences in the medications prescribed to nursing home patients compared to the medications prescribed to residential home patients. In the second part a descriptive study was conducted, investigating factors influencing the medication prescriptions physicians to elderly patients by a questionnaire.

### STUDY SETTING

The study was carried out in an institution in an eastern city in The Netherlands. The institution consisted of a residential home and a nursing home, with a total capacity of 80-90 residential home patients and 24 nursing home patients. The residential home patients received medication prescriptions from their own general practitioner and they possibly also received medication prescriptions from other concerned specialties. The nursing home patients received medication prescriptions from the nursing home physician. Whenever the nursing home patients got medications prescribed by a specialist, the nursing home physician had to approve the medicine and prescribe it to the patient. Medications from the nursing home patients were always the responsibility of the nursing home physician. The medications in the whole organization were supplied by one pharmacy.

### CASE SELECTION AND SAMPLING

All patients aged 65 years and older, living within the residential or nursing home at time of data collection, from 1 April 2013 till 31 May 2013, and being under supervision of either a nursing home physician or a general practitioner, were eligible for this study. Only patients that gave permission for access into their patient files were included in the study. When the data of patients were incomplete, the patients were not excluded from the study, all available and usable data were included in the study. Patients were excluded from the study when they moved or died during the data collecting period and/or when they were consulted by both a general practitioner and a nursing home physician. The patient characteristics of the residential home patients and the nursing home patients were checked on similarity with regard to age, gender, medical conditions, and the ‘Zorgzwaartepakket Verpleging & Verzorging’ (ZZP VV), which is the intensity of the care package for nursing and care. The intensity of care increases with the number of the ZZP: a patient with ZZP 1 only needs some guidance and a patient with ZZP 7 needs sheltered housing with intensive care (27). The residential home and nursing home housed patients with ZZPs between 1 and 7.
For the second part of the study, a questionnaire was created to study factors influencing the prescribing behavior of physicians. The questionnaires were send out to all physicians of

all the patients within the concerned institution. Both general practitioners and nursing home physicians had the opportunity to fill out the questionnaire. The returned questionnaires were anonymous.

### DATA COLLECTION

For both patient groups, quantitative data were collected from 1 April to 31 May 2013. A medical information form was created to collect the needed patient characteristics. Anonymity was guaranteed: the data were extracted within the organization and confidential information has not left the organization. Patients demographics of all patients were extracted from patient files from both the nursing and the residential home. Medical information from the nursing and residential home patients was extracted from the electronic patient files in the nursing and residential home and from the pharmacy. Information about the prescribed medications, start date of drugs, dosage and prescriber was collected at the pharmacy. The prescribed medications of the patients at one point in time were included in the study. Information to determine PIMs was collected by the STOPP criteria (26).

The drugs were classified according to the Anatomical Therapeutic Chemical (ATC) classification from the World Health Organization (WHO) (28). Only substances with an ATC code were included in the data analysis. In the study, oral, intramuscular, subcutane, oromucosal and transdermal medications were included.

For the second part of the study a questionnaire was composed, containing questions on all factors found in literature that might influence physicians when prescribing medications. The questionnaire existed of both quantitative and qualitative questions. For the qualitative questions, open ended questions were used to give the physicians the opportunity to give their opinion, and closed ended questions with an option were used to give an complement to an answer. The questionnaire contained questions on general information, education, followed geriatric training, and years of experience in elderly care. The physicians were asked about the distinctions they made between elderly and non-elderly, and the occurrence of pharmacotherapeutic consultations was inquired. The time physicians had for reevaluating the medications of the patients was viewed, and the physicians were asked to what extent the expectations of patients influenced their medication prescriptions to elderly patients. The physicians were asked how much their prescribing behavior depends on costs of medications. The physicians had to specify whether or not they used guidelines, which guidelines they used, and to what extent they followed these guidelines. The last topic of the questionnaire focused on different criteria that helped physicians making the right choices. The physicians were asked about their knowledge about the STOPP and the Beers criteria and whether or not they took these criteria in consideration when prescribing medications.

### DATA ANALYSIS

A database was established and analyzed by SPSS version 21 for Windows (IBM Corporation and other(s) 1989, 2012). Assumptions for normality were checked and descriptive statistics were used to study the different patient characteristics. The nursing home patients and the residential home patients were checked on similarity by looking at the ZZPs, age, and the number of co morbidities. Differences in medications prescribed to residential home patients and nursing home patients were analyzed based on the number of medications prescribed, the number of PIMs prescribed and the presence of polypharmacy. PIMs were defined by the to the Dutch situation adapted STOPP criteria (3, 24-26). Depending on the number of medications and diseases, one single patient could have multiple PIMs prescribed. In this study polypharmacy was defined as the use of nine or more medications simultaneously (2, 6, 29).

The mean number of medications prescribed and the mean number of PIMs prescribed were calculated per patient group and differences were tested by an independent sample T-test. A p-value of $\leq 0.05$ was accepted as statistically significant in this study. The presence of polypharmacy in both groups was calculated, and the relationship between the type of institution and polypharmacy, and the type of institution and the prescription of PIMs, were tested by a Chi-square test. Relationships between the number of PIMs, the number of medications, the number of co morbidities, and age were tested with a Pearsons Correlation.

The results found in the questionnaire were partially analyzed by SPSS. The closed ended questions were analyzed and given in percentages. The open ended, qualitative questions were used as additional explanations for the closed ended questions.

Table 1: Patient characteristics, co morbidities and prescribed medications of all patients by type of institution (n=58)

| General patient characteristics by type of institution | | |
|---|---|---|
| | Nursing home (n=21) Mean (SD) or N (%) | Residential home (n=37) Mean (SD) or N (%) |
| Female patients | 16 (76.2) | 31 (83.8) |
| Mean age | 86.29 (5.79) | 85.24 (4.25) |
| Range age | 72 - 96 | 78 - 92 |
| Range of number of medications prescribed | 3-17 | 1-19 |
| Mean number of co morbidities per patient | 4.24 (1.64) | 3.89 (1.78) |
| Mean number of medications prescribed per patient | 8.62 (3.49) | 10.00 (4.17) |
| Number of patients in which polypharmacy is present | 8 (38.1) | 23 (62.2) |
| Mean number of PIMs prescribed per patient | 1.76 (1.41) | 1.30 (1.35) |
| Number of patients in which at least one PIM is prescribed | 17 (81.0) | 24 (64.9) |
| **Most frequently co morbidities by type of institution** | | |
| Dementia | 20 (22.5) | 10 (6.8) |
| Hypertension | 14 (15.7) | 21 (14.4) |
| Heart failure | 11 (12.4) | 25 (17.1) |
| Astma/COPD | 7 (7.9) | 13 (8.9) |
| Depression | 7 (7.9) | 12 (8.2) |
| Diabetes Mellitus | 5 (5.6) | 9 (6.2) |
| **Most frequently prescribed medication groups by type of institution** | | |
| Alimentary tract and metabolism | 44 (24.3) | 88 (23.9) |
| Blood and blood forming organs | 14 (7.7) | 33 (9.0) |
| Cardiovascular system | 35 (19.3) | 106 (28.8) |
| Muscolo-skeletal system | 8 (4.4) | 10 (2.7) |
| Nervous system | 59 (32.6) | 79 (21.5) |
| Respiratory system | 11 (6.1) | 25 (6.8) |

## RESULTS

The data of a total of 58 patients were included in the study. Of these patients, 21 were nursing home patients and 37 were residential home patients. The mean age of all the nursing home patients in the sample was 86 and the mean age of all residential home patients was 85 (Table 1). One subject received medications from both a general practitioner and a nursing home physician, this subject was excluded from the data analysis. The two patient groups were equally divided by age (mean age: nursing home = 86; residential home = 85; p = .463) and gender (Table 1). In all different subgroups in which analyzes were performed, the variances in the groups were assumed to be equal (Levene's Test for Equality of Variances in all cases > .05). The distribution of ZZPs differed among both groups. This problem was solved by analyzing different subgroups of patients with specific ZZPs and a specific number of co morbidities. The nursing home existed of patients that mainly had a ZZP of 5 or higher. In the residential home the distribution of ZZPs was more widespread, but the number of high ZZPs was quite similar to the high ZZPs within the nursing home. The mean number of co morbidities per patient group seemed to be equally divided (mean number co morbidities: nursing home = 4.24; residential home = 3.89; p = .467) (Table 1). The eight most common co morbidities are shown in Table 1. There was no relationship found between age and the number of co morbidities (Pearsons Correlation = - .033; p = .807). The three most commonly prescribed groups of medications according to the ATC- code were: alimentary tract and metabolism (nursing home = 24.3%; residential home = 23.9%), cardiovascular system (nursing home = 19.3%; residential home = 28.8%) and nervous system (nursing home = 32.6% ; residential home = 21.5%), as can be seen in Table 1.

### NUMBER OF MEDICATIONS PRESCRIBED AND POLYPHARMACY

There was a positive relationship (Pearsons Correlation = .549; p ≤ .000) between the number of co morbidities and the number of medications prescribed (p < .001). As could have been expected; the more co morbidities a patient had, the more medications were prescribed. Age seemed not to be related to the number of medications prescribed (Pearsons Correlation = -.144; p = .393). The mean number of prescribed medications was 8.62 per patient within all the nursing home patients and 10.00 medications per patient within all the residential home patients (p = .1025) (Table 1). This is not a significant difference and this group of patients is not very similar with regard to the ZZPs and the number of co morbidities. When only patients with ZZP ≥ 3 were analyzed, the mean number of co morbidities did not seem to differ between the two groups (p = .900), the mean number of medications prescribed was higher within the residential home patients, but this difference was not significant (mean number medications: nursing home = 8.07; residential home = 10.21; p = .061) (Table 2). Specifying the research group into ZZP ≥ 3 and the number of co morbidities ≥ 3 leads to a significantly higher mean number of prescribed medications within the residential home patients (mean number of medications: nursing home = 7.92; residential home = 11.22; p = .012) (Table 2). When the

patient groups were defined to ZZP ≥ 4 and the number of co morbidities ≥ 3, both groups existed of 13 patients. In this case the group of residential home patients were prescribed significantly more medications than the nursing home patients (mean number of medications prescribed: nursing home = 7.92; residential home = 11.62; p = .009), see Table 2.

In all of the subgroups the percentage of patients with polypharmacy was higher within the residential home (Table 2). In all four created subgroups the type of institution was significantly statistically related to the presence of polypharmacy (Table 2). The relationship between type of institution and presence of polypharmacy became stronger when the patient groups became more complex. The significant relationship showed that more residential home patients had polypharmacy, compared to the nursing home patients.

## PRESCRIPTION OF PIMs

In this study 81.0% of all nursing home patients and 64.9% of all residential home patients had at least one PIMs prescribed (Table 1). The number of PIMs prescribed was significantly related to the number of medications prescribed (Pearsons Correlation = .399; p = .005): when the number of prescribed medications increased, the number of PIMs increased. When all patients were included, the mean number of PIMs was slightly higher within the nursing home patients (mean number PIMs: nursing home = 1.76; residential home = 1.30; p = .221) see Table 1. Within the patients with ZZP ≥ 3 and a number of co morbidities ≥3, the mean number of PIMs per patient was slightly higher within the residential home patients, but this difference was not significant (mean number of PIMs: nursing home = 1.23; residential home = 1.57; p = .256). Within these patients, 69.2% of the nursing home patients, and 69.6% of the residential home patients had at least one PIM prescribed (Table 2). When the patients groups were specified to ZZP ≥ 4 and number of co morbidities ≥ 3, the difference between the number of PIMs prescribed in both groups became slightly larger, but the difference still was not significant (mean number of PIMs: nursing home = 1.23; residential home = 1.85; p = .158). In this situation, 69.2% of the nursing home patients, and 76.9% of the residential home patients had at least one PIM prescribed (Table 2).

When all patients were included in the analysis, the type of institution was not statistically related

Table 2: Characteristics of medication prescriptions by type of institution

| | Patients with ZZP ≥ 3 (n=43) Mean (SD) or N (%) | | Patients with ZZP ≥ 4 (n=32) Mean (SD) or N (%) | | Patients with ZZP ≥ 3 and number of co morbidities ≥ 3 (n=36) Mean (SD) or N (%) | | Patients with ZZP ≥ 4 and number of co morbidities ≥ 3 (n=26) Mean (SD) or N (%) | |
|---|---|---|---|---|---|---|---|---|
| | Nursing home patients (n=14) | Residential home patients (n=29) | Nursing home patients (n=14) | Residential home patients (n=18) | Nursing home patients (n=13) | Residential home patients (n=23) | Nursing home patients (n=13) | Residential home patients (n=13) |
| Mean age in years | 86.50 (5.92) | 85.28 (4.32) | 86.50 (5.92) | 85.06 (4.63) | 85.77 (5.46) | 85.39 (4.56) | 85.77 (5.46) | 85.15 (5.01) |
| Mean number of co morbidities | 4.14 (1.66) | 4.07 (1.85) | 4.14 (1.66) | 3.83 (1.92) | 4.31 (1.60) | 4.74 (1.42) | 4.31 (1.60) | 4.77 (1.30) |
| Mean number of medications prescribed per patient | 8.07 (3.41) | 10.21 (4.46) * | 8.07 (3.41) | 10.11 (4.38) * | 7.92 (3.50) | 11.22 (4.29) ** | 7.92 (3.50) | 11.62 (3.89) ** |
| Number of patients in which polypharmacy present | 5 (35.7) | 19( 65.5) ** | 5 (35.7) | 12 (66.7) ** | 4 (30.8) | 17 (73.9) ** | 4 (30.8) | 10 (76.9) ** |
| Number of patients in which at least one PIM is prescribed | 10 (71.4) | 20 (69.0) | 10 (71.4) | 14 (77.8) | 9 (69.2) | 16 (69.6 | 9 (69.2) | 10 (76.9) |
| Mean number of PIMs prescribed per patient | 1.43 (1.51) | 1.48 (1.43) | 1.43 (1.51) | 1.72 (1.53) | 1.23 (1.36) | 1.57 (1.50) | 1.23 (1.36) | 1.85 (1.68) |

* = p- value ≤ 0.10 (Comparison between the medication prescriptions of nursing home patients and residential home patients)
or (Statistical relationship between type of institution and presence of polypharmacy)
** = p-value ≤ 0.05 (Comparison between the medication prescriptions of nursing home patients and residential home patients)
or (Statistical relationship between type of institution and presence of polypharmacy)

to having a PIM prescribed (Chi-square 1.673, p-value 0.196). In the other subgroups the statistical relationship between the type of institution and having a PIM prescribed was even less.

Table 3: Results questionnaire 'Factors influencing prescribing behavior of physicians'

| General characteristics respondents Mean (SD) or N (%) | | | | |
|---|---|---|---|---|
| Number of respondents | 8 | | | |
| Mean age | 50.50 (11.17) | | | |
| Female physicians | 3 (37.5) | | | |
| General practitioners | 7 (87.5) | | | |
| Nursing home physicians | 1 (12.5) | | | |
| Mean years experience in care elderly | 17.00 (9.75) | | | |
| Followed geriatric training | 1 (12.5) | | | |
| **Results questionnaire closed ended questions N (%)** | | | | |
| | **Yes** | | **No** | |
| Feedback pharmacists | 8 (100.0) | | 0 (0.0) | |
| Medication review last twelve months | 4 (50.0) | | 4 (50.0) | |
| More likely to prescribe medications when it concerns an elderly patient | 3 (37.5) | | 5 (62.5) | |
| More likely to prescribe when patient wants medications | 6 (85.7) | | 1 (14.3) | |
| | **Rarely or never** | **Occasionally** | **Fairly often** | **Very often** |
| Frequency of feedback from pharmacy | 0 (0.0) | 0 (0.0) | 4 (50.0) | 4 (50.0) |
| Frequency of changing medication after medication review | 0 (0.0) | 2 (50.0) | 2 (50.0) | 0 (0.0) |
| Usage other motivations when prescribing to older patient | 1 (12.5) | 2 (25.0) | 1 (12.5) | 4 (50.0) |
| Taking costs in consideration when prescribing medications | 0 (0.0) | 3 (42.9) | 4 (57.1) | 0 (0.0) |
| Usage criteria/guidelines when prescribing medications | 0 (0.0) | 1 (14.3) | 5 (71.4) | 1 (14.3) |
| Usage Beers criteria when prescribing medications | 6 (85.7) | 0 (0.0) | 1 (14.3 | 0 (0.0) |
| Usage of STOPP criteria when prescribing medications | 5 (71.4) | 1 (14.3) | 1 (14.3) | 0 (0.0) |

## PRESCRIBING BEHAVIOUR PHYSICIANS

A questionnaire was send out to all general practitioners and nursing home physicians who were active within the concerned institution. A total of 7 general practitioners and one nursing home physician returned the questionnaire. The mean age of all respondents was 50.5 and the general practitioners had on average 17 years of experience in the care for elderly patients (Table 3). Because only one nursing home physician filled in the questionnaire, no comparisons were made between the factors influencing the medication prescriptions of nursing home physicians and general practitioners. General motivations influencing the prescribing behavior of physicians to elderly patients were analyzed.

All of the respondents received feedback from the pharmacists about doses and duration of usage of medications and half of the respondents stated that a medication review had taken place in the last twelve months (Table 3). Most of the respondents (75%) argued that they did not had enough time to review the medications of all patients. More than one third (37.5%) of the respondents stated they would be more likely to prescribe medications when it concerned an elderly patient, more than half of the respondents often used guidelines when prescribing medications, and more than half of the respondents (62.5%) often or very often used other motivations when they were prescribing medications to an elderly patient (Table 3). 85.7% of the respondents suggested they probably would prescribe medications to an elderly patient when they noticed the patient wanted medications (Table 3). Most of the respondents rarely or never used the Beers or STOPP criteria when prescribing medications (Table 3). The aforementioned outcomes of the questionnaire indicate that physicians do have some other motivations when prescribing medications to elderly patients.

The quality of the feedback the respondents received from the pharmacy was basically good and most of the respondents appreciated the control of the pharmacist. They thought the feedback sometimes *was to brief* and *the pharmacy did not always had a clear view of the patients*. Time seemed to be an obstacle within the medication reviews. The respondents often only reviewed the medications of elderly patients, but even then time was seen as an obstacle. All of the respondents that participated in a medication review, changed the medication prescriptions after that review, mainly because *the evidence was clear again* and *the medication was critically viewed*. The main reasons of the respondents of being more likely to prescribe medications when it concerned an elderly patient, were that *elderly wanted to "get something from the doctor"* and that *prescription by an infection is done faster in elderly patients because of impaired immunity of the patients*. The physicians differentiated between younger and elderly patients by *kidney and other organ functions, interactions, relevance of indication to*

*prescribe, requirements in life, more side effects, more risks*, and *by the fact that in elderly people not everything has to be treated*. Main reasons of the respondents to prescribe medications when the patient wanted to get medications prescribed were that: *the medication could have a placebo effect, that the patient would be satisfied when medication was prescribed, that the patient had positive expectations of medications, and that it would decreases the demand for care*. The respondents did not always agree with the guidelines they used: *often they are established too general, treatments are specific for each patient so guidelines and criteria do not always work, and sometimes new understandings are not included*. Besides the mentioned guidelines and criteria, the respondents mentioned they used other criteria, like the 'Pharmacotherapeutic Compass', standards from the 'National Society of General Practitioners' (NHG), consultations with a pharmacist, and experience with elderly patients and with specific medications.

Physician sometimes had insufficient time to deliver the quality of care they would like to deliver to elderly patients. The physicians explained that elderly often need more medications, and elderly patients often want to get medications prescribed. Physicians sometimes were more likely to prescribe medications to elderly, because it could have a placebo effect, and the patients then are satisfied.

## DISCUSSION

The purpose of this study was to explore possible differences in the medications prescribed to nursing home patients compared residential home patients. The second part of the study was focused on general factors influencing the medication prescriptions of physicians to elderly patients.

In the more complex patient groups, patients with a high ZZP and multiple co morbidities, there were significantly more medications prescribed to the residential home patients than to the nursing home patients. This result corresponds to other studies where geriatric trained physicians/physicians with experience seemed to prescribe fewer medications than general practitioners/physicians that were less involved with elderly patients (21, 22).

There was also a significant relationship between the type of institution and the presence of polypharmacy, which is in agreement with other studies (22): in the residential home, significantly more patients had polypharmacy, compared to the nursing home. Although only a small sample was included, the relationship between type of institution and presence of polypharmacy seemed to be very strong and the differences in percentages were large, which makes this outcome relevant.

Medications prescribed to residential home patients were in this study compared to medications prescribed to nursing home patients. Previous studies compared the medications prescribed by geriatric trained/nursing home based physicians to the medications prescribed by general practitioners/office based physicians (21, 22). This study might also say something about the medication prescriptions of the physicians; all medications of nursing home patients were prescribed by a nursing home physician and whenever a patient visited a specialist and got medications, the nursing home physician had to approve and prescribe these medications. The reason we have, in this study, examined the medication prescriptions from the perspective of the patient is, that medications prescribed to residential home patients can be prescribed by their own general practitioner, but also by other general practitioners and/or other specialties, which, in turn, would not say anything about the medication prescriptions of general practitioner in general.

In the current study, 81.0% of the nursing home patients and 64.9% of the residential home patients included had at least one PIM prescribed. This is higher than the percentage that is mentioned in other studies, where 40% of the nursing home patients in the one study and 36.9% in the other study had a PIM prescribed (3, 22). Factors explaining the relative high presence of PIMs in this institution have not been found. Previous study has shown that the odds of being prescribed a PIM are significantly higher within the prescriptions of not geriatric trained physicians (22). In this study, no significant differences are found in the mean number of PIMs prescribed to the residential home patients, compared to the nursing home patients. There also was no significant relationship between the type of institution and the number of PIMs prescribed.

The current study was carried out within one institution, with a total capacity around 110 patients. Because it was difficult to gain permission from all patients and/or their legal representative for access into their patient files, not all patients from the institution were included into the study. The relatively small and not complete research group (21 nursing home patients and 37 residential home patients) seems

to be representative for the whole institution, because the ZZPs of all patients were equally divided and similar to the ZZPs within the whole institution. The two groups were similar with regard to age, ZZP and mean number of co morbidities. Other studies included more patients in their study to compare the prescribing behavior of general practitioners and nursing home physicians (21, 22), but their outcomes were in line with the outcomes of this study. The reliability of the outcomes would have been greater when more patients were included, because the subgroups of complex patients would have been larger, which could have allowed more tests. Nevertheless, the significant outcomes of this study seem to be relevant, and differences found are so large that some attention should be paid.

The medication prescriptions of both groups were comparable because all medications were supplied by one single pharmacy. Both groups were from the start equally divided by age and gender, but there were differences between the groups with respect to ZZP and the number of co morbidities. Statistical tests have been carried out in more complex patient groups to ensure a more honest comparison. This leads to the fact that the study might not be representative to other institutions, because less complex patients were not included in the analysis. However, the result is relevant for other institutions in The Netherlands, because the current developments in healthcare ensure patients to continue to live at home longer, and only more severe patients will be admitted to residential or nursing homes (30, 31). Because the absence of less complex patients, we could not identify to what extent polypharmacy, PIMs and multiple medications are present in less complex patients in the institution. This probably does not reduce the value of this study to a large extent, because, as mentioned earlier, nursing and residential homes increasingly provide shelter to more complex patients, and especially these complex elderly patients are at risk of harmful interactions caused by polypharmacy and PIMs (1, 2).

Because the study was carried out in one institution, the medication prescriptions might not representative for the medication prescriptions of all other physicians, which could limit the generalizability of the study.

The institution in which this study was carried out has a religious character which could have influenced the medication prescribed to the patients. How, and whether or not it has influenced the medication prescriptions is not known. Other studies also do not indicate if, and how, religion influences medication prescriptions. The religious character does not affect the outcome of this study, because both groups were religious. In future studies it would be interesting to examine whether religion influences the prescription of medications.

It is possible that in the study PIMs have been undetected because of lack of registered information. Only electronic patient files and information from the pharmacy was used for the data collection. It is not possible that too many PIMs have been detected. If PIMs have been undetected, this would have been the case to the same extent in both patient groups, and it therefore does not influence the results of this study.

Several studies have investigated the differences in the prescribing behavior of general practitioners and nursing home physicians. These studies indicate that lack of knowledge and/or experience, and less closely following guidelines might cause the prescription of multiple medications and the prescription of PIMs to elderly patients (22, 23). In this study, factors that could influence the prescribing behavior of physicians were investigated. The number of nursing home physicians was already limited, and unfortunately only one nursing home physician returned the questionnaire. Because of this limited response, no comparison could be made between general practitioners and nursing home physicians with regard to the factors that influence the prescribing behavior. For future research it would be interesting to investigate factors influencing physicians and causing the differences in the medications prescribed to residential home compared to nursing home patients in The Netherlands.

Factors influencing the prescribing behavior of physicians prescribing for elderly in general could still be analyzed in this study. Interesting was that most of the respondents were more likely to prescribe medications to a patient when they noticed the patients wanted medication, which corresponds with previous research (16, 17). The physicians did not always have sufficient time to organize medication reviews, which could result in overlooking possible harmful interactions of medications (1, 2), and could be a cause of the prescription of PIMs to elderly patients. Whether a medication review lowers the prescription of multiple medications and/or PIMs could not be told based on the results of this study.

In conclusion, despite some shortcomings, this study indicates there are significant differences in the number of medications prescribed, and the presence of polypharmacy between nursing home patients and residential home patients, which is in line with the results of other studies. Differences in the number of medications prescribed in both groups alone cannot be interpreted as a measurement for the quality of care, but based on this study we learned that the number of medications prescribed is significantly related to the number of PIMs prescribed. Because of the risks for adverse drug events, the occurrence of PIMs and polypharmacy should be reduced to increase the safety of the patients (9, 10). Final answers cannot be given about the reasons for the differences in the prescribed medications to nursing home patients and residential home patients. More research should be conducted in The Netherlands to study the particular causes for the differences in medications prescribed to nursing home patients compared to residential home patients. Practically none of the concerned physicians had undergone geriatric training or used the STOPP criteria when prescribing medications. We would advise to investigate in further research whether geriatric training and the use of STOPP criteria reduce the prescription of PIMs and multiple medications from physicians to elderly patients. For now we recommend, in agreement with previous research, medication reviews and the use of the STOPP criteria to help to alert the physician to serve the right treatment when prescribing medications to elderly patients (22, 24-26).

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## RECOMMENDATIONS

Based on the outcomes of this master thesis I would like to recommend Carrintreggeland and/or other interested parties to conduct more research into the possible differences in the medications prescribed to residential home patients compared to nursing home patients. In future research it would be interesting to examine factors causing the differences found in the current study. Also the effect of using STOPP criteria, of following geriatric training, and of experience in elderly care on the prescription of medications from physicians to elderly patients would be interesting to study in following research.

None of the physicians that filled in the questionnaire on prescribing behavior used the STOPP criteria, while the Dutch 'Multidisciplinary Guideline Polypharmacy in the elderly 2012' advised to use these criteria as a tool in carrying out pharmacotherapeutic analysis. The guideline is created by general practitioners, geriatric specialized physicians and medical specialists. I would like to advise physicians that provide care to elderly patients to use the STOPP criteria as a tool to prevent prescription of potential inappropriate medications in elderly patients. Physicians generally already are concerned with multiple different guidelines, but in my opinion this tool can play an important role in improving safe and adequate medication prescriptions, and in preventing elderly patients from adverse drug events and drug-drug interactions.

## REFLECTION

The final purpose to finish the master Health Sciences was to conduct a graduate research and to develop a master thesis. For this master thesis I wanted to discuss a topic that was interesting for me as a nurse, in which I succeeded. Because of my experience in nursing, I already knew a thing about medications, diseases in frail elderly patients, and nursing and residential homes. The first part of the master thesis I thought were the hardest. I had little experience in doing a literature study and even fewer experience in writing a plan of action for a master thesis. By reading trough multiple different articles, I became more familiar with the aspect of doing research. The basics of doing research I have learned during the premaster period and during the master Health Sciences, where I have followed different courses on different topics of doing research. Within a relatively short timeframe I had created a basic design of the introduction and method section of the master thesis.

The practical part of the study was more time consuming. Making appointments with various parties often was difficult partly due to busy schedules of different persons. In retrospect I think I could have showed more initiative to ensure appointments were made and to ensure everything was arranged in a shorter time frame.

Once the most important agreements were made, I could start with collecting data. In order to collect data of all patients, the patients, or their legal representative, had to give permission for access into their patient files. This appeared to be very time consuming and I think waiting for approval took the most time of all. Eventually I had enough consent forms to start with data analysis. From then on it all went a lot faster, and I could start writing the final product.

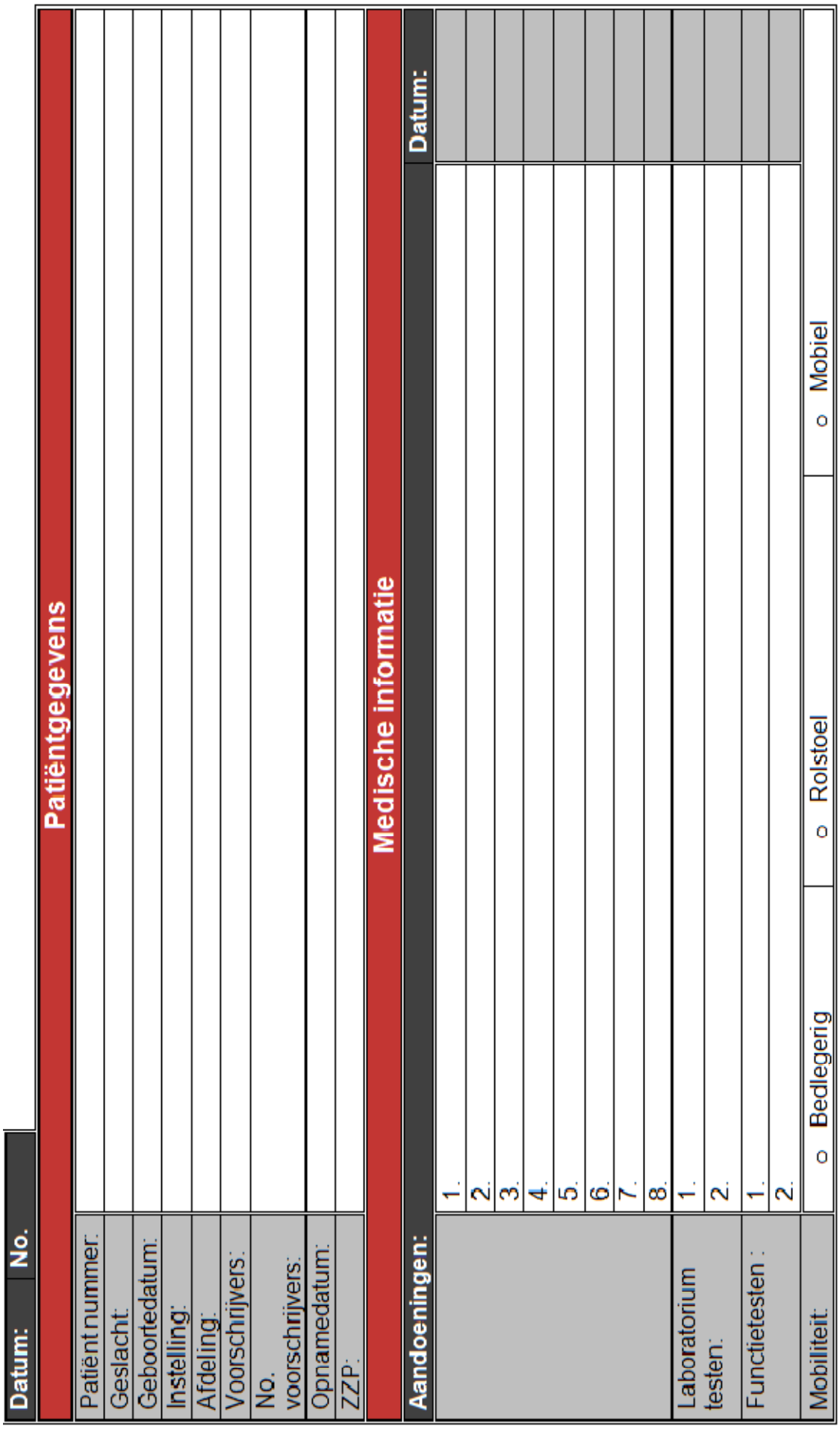
Besides the time consuming period of waiting for approval from the patients, I think the whole research project went smoothly. I have had multiple appointments with my supervisors to receive feedback on my master thesis.

In retrospect I thought I have learned a lot, and it was very interesting carrying out this research and creating this master thesis.

## APPENDICES

1. Medical information form for data collection of patient characteristics
2. Questionnaire ‘Factors influencing medication prescriptions of physicians to elderly patients’

## 1. MEDICAL INFORMATION FORM FOR DATA COLLECTION OF PATIENT CHARACTERISTICS



| Datum: | No. |
|---|---|
| **Patiëntgegevens** | |
| Patiëntnummer: | |
| Geslacht: | |
| Geboortedatum: | |
| Instelling: | |
| Afdeling: | |
| Voorschrijvers: | |
| No. voorschrijvers: | |
| Opnamedatum: | |
| ZZP: | |
| **Medische informatie** | |
| **Aandoeningen:** | **Datum:** |
| 1. | |
| 2. | |
| 3. | |
| 4. | |
| 5. | |
| 6. | |
| 7. | |
| 8. | |
| Laboratorium testen: | 1. |
| | 2. |
| Functietesten : | 1. |
| | 2. |
| Mobiliteit: | o Bedlegerig o Rolstoel o Mobiel |

## 2. QUESTIONNAIRE "FACTORS INFLUENCING MEDICATION PRESCRIPTIONS OF PHYSICIANS TO ELDERLY PATIENTS"

# Factoren die het voorschrijven beïnvloeden

| Begrip | Dimensies | Indicatoren | Enquêtevraag |
|---|---|---|---|
| Algemene informatie | | Geslacht<br>Leeftijd<br>Instelling<br>Opleiding<br>Vakgroep | Geslacht: man/vrouw<br>Leeftijd:<br>Instelling: verpleeghuis/verzorgingshuis<br>Opleiding(en):<br>Vakgroep: huisarts/verpleeghuisarts |
| Mate van aanwezigheid van determinanten die invloed kunnen hebben op het voorschrijfgedrag van artsen | Jaren ervaring in ouderenzorg:<br>Het aantal jaren ervaring in de ouderenzorg kan het voorschrijfgedrag beïnvloeden (1). | Het aantal jaren ervaring in de ouderenzorg | Aantal jaren ervaring binnen de zorg voor de oudere patiënt (65+): |
| | Opleiding/bijscholing:<br>Geriatrische bijscholing en/of opleiding beïnvloed het voorschrijfgedrag voor ouderen positief. Scholing zorgt voor zorgvuldiger volgen van richtlijnen (1, 2). | Wel/geen geriatrische bijscholing/opleiding | Heeft u een geriatrische opleiding, scholing of bijscholing gevolgd?<br>Heeft u zich verdiept in het voorschrijven van medicijnen aan de oudere patiënt (65+) en zo ja, op welke manier? |
| | Feedback apotheker op voorschrijfgedrag arts:<br>Opmerkingen van de apotheker over interacties, doses en gebruiksduur beïnvloeden het voorschrijfgedrag positief (1-3) | Wel/geen feedback ontvangen van apotheker<br>Frequentie ontvangen feedback van apotheker | Krijgt u wel eens feedback van een apotheker over interacties, doses en/of gebruiksduur van medicijnen?<br>Kunt u aangeven hoe vaak u gemiddeld per maand feedback ontvangt over interacties, doses en/of gebruiksduur van medicijnen? |
| | Farmacotherapeutisch overleg, medicatie beoordeling:<br>Volgens de literatuur moet er minimaal een keer per jaar een medicatie beoordeling/ farmacotherapeutisch overleg plaatsvinden (herevalueren van medicijnen van patiënt met meerdere disciplines, waaronder voorschrijver, apotheker, patiënt of wettelijk vertegenwoordiger)(1,4-6) | Wel/ geen medicatie beoordeling/ farmacotherapeutisch overleg<br>Frequentie medicatie beoordeling /farmacotherapeutische overleg per patiënt | Heeft er de afgelopen 12 maanden een medicatie beoordeling/ farmacotherapeutisch overleg van alle patiënten plaatsgevonden? Zo nee, waarom niet?<br>Hoe vaak heeft de afgelopen 12 maanden een medicatie beoordeling/ farmacotherapeutisch overleg plaatsgevonden per patiënt? |
| | Beers – criteria:<br>Gebruik van de Beers criteria helpt om veilig medicijnen voor te schrijven aan ouderen. Gebruik van de Beers criteria helpt om 'poteltial inappropriate medications'(PIMs) niet voor te schrijven aan ouderen (7). | Wel/geen en mate van gebruik Beers criteria | In welke mate maakt u gebruik van de Beers-criteria bij het voorschrijven van medicatie aan oudere patiënten? |
| | STOPP –criteria:<br>Gebruik van de STOPP criteria helpt om veilig medicijnen voor te schrijven aan ouderen. Gebruik van de STOPP criteria helpt om 'potential inapropriate medications' (PIMs) niet voor te schrijven aan ouderen (8). | Wel/geen en mate van gebruik STOPP criteria | In welke mate maakt u gebruik van de STOPP criteria bij het voorschrijven van medicatie aan oudere patiënten? |
| | Richtlijnen:<br>Het hebben/gebruiken van medische richtlijnen zorgt voor veilige en adequate medicijnvoorschriften (5). | Wel/geen en mate van gebruik richtlijnen.<br>Welke richtlijnen | In welke mate maakt u gebruik van richtlijnen bij het voorschrijven van medicatie aan oudere patiënten?<br>Van welke richtlijn(en) maakt u gebruik bij het voorschrijven van medicijnen aan oudere patiënten? |
| | Overig | Andere, niet eerder genoemde factoren | Zijn er nog andere, niet eerder genoemde factoren waarvan u denkt dat ze van invloed zijn op het voorschrijven van medicijnen aan oudere patiënten? Zo ja, zou u deze kunnen |

| | | | |
|---|---|---|---|
| | | | specificeren? |
| Effecten/gevolgen van determinanten die invloed kunnen hebben op het voorschrijfgedrag van artsen | Feedback apotheker:<br>Opmerkingen van de apotheker over interacties, doses en gebruiksduur beïnvloeden het voorschrijfgedrag positief (1-3) | Feedback opvolgen<br>Kwaliteit feedback | In welke mate past u medicijnvoorschriften aan wanneer u feedback van de apotheker ontvangt over interacties, doses en/of gebruiksduur?<br>Wat vindt u van de kwaliteit van de feedback die u van de apotheker ontvangt? |
| | Farmacotherapeutisch overleg, medicatie beoordeling:<br>Volgens de literatuur moet er minimaal een keer per jaar een medicatie beoordeling/ farmacotherapeutisch overleg plaatsvinden (herevalueren van medicijnen van patiënt met meerdere disciplines, waaronder voorschrijver, apotheker, patiënt of wettelijk vertegenwoordiger)(1,4-6) | Medicijnvoorschriften aanpassen naar aanleiding van farmacotherapeutisch overleg<br>Tijd voor herevalueren | In welke mate past u voorgeschreven medicijnen aan wanneer een wijziging ter sprake komt tijdens een medicatie beoordeling/ farmacotherapeutisch overleg?<br>Waarom past u de voorgeschreven medicijnen juist wel/niet aan wanneer dit ter sprake komt tijdens een medicatie beoordeling/farmacotherapeutisch overleg?<br>Vind u dat u voldoende tijd hebt u om het medicijngebruik van alle patiënten te herevalueren? |
| | Leeftijd patiënten:<br>Onderzoek laat zien dat het voorkomt dat artsen anders voorschrijven aan oudere patiënten dan aan jongere patiënten(9). | Onderscheid maken<br>Manier van onderscheid maken | In welke mate maakt u gebruik van andere criteria/beweegredenen bij het voorschrijven van medicijnen aan de oudere patiënt (65+) in vergelijking met jongere patiënten?<br>Op welke manier maakt u onderscheid tussen jongere patiënten en oudere patiënten?<br>Zou u geneigd zijn eerder medicijnen voor te schrijven wanneer het om een oudere (65+) patiënt gaat, dan wanneer het om een jongere patiënt gaat? Waarom wel/niet? |
| | Patiënt voorkeuren/ vraag patiënt:<br>Rekening houden met de voorkeuren/vraag van de patiënt bij het voorschrijven van medicijnen beïnvloed de manier van voorschrijven van medicatie(1, 10-12) | Rekening houden met wensen/verwachtingen<br>Anders voorschrijven als patiënt wensen/verwachtingen heeft | Waartoe bent u het meest geneigd wanneer u merkt dat een patiënt medicijnen wenst/verwacht?<br>Kunt u aangeven waarom u juist meer/minder geneigd bent medicijnen voor te schrijven wanneer u merkt dat een patiënt graag medicijnen wenst/verwacht? |
| | Kosten:<br>Kosten kunnen een beïnvloedende factor zijn bij het voorschrijven van medicatie (11). | Invloed kosten op voorschrijfgedrag | In welke mate neemt u kosten van een medicijn mee bij de keuze voor een bepaald medicijn? |
| | Beers-criteria:<br>Gebruik van de Beers criteria helpt om veilig medicijnen voor te schrijven aan ouderen. Gebruik van de Beers criteria helpt om 'poteltial inappropriate medications'(PIMs) niet voor te schrijven aan ouderen (7). | Criteria opvolgen<br>Eens/oneens met criteria | In welke mate volgt u de criteria op die gesteld worden in de Beers- criteria?<br>Bent u het eens met de Beers-criteria? Waarom wel/niet? |
| | STOPP-criteria:<br>Gebruik van de STOPP criteria helpt om veilig medicijnen voor te schrijven aan ouderen. Gebruik van de STOPP criteria helpt om 'potential inapropriate medications' (PIMs) niet voor te schrijven aan ouderen (8). | Criteria opvolgen<br>Eens/oneens met criteria | In welke mate volgt u de criteria op die gesteld worden in de STOPP criteria?<br>Bent u het eens met de STOPP-criteria? Waarom wel/niet? |
| | Richtlijnen:<br>Het hebben/gebruiken van medische richtlijnen zorgt voor veilige en adequate medicijnvoorschriften (5). | Richtlijnen opvolgen<br>Eens/oneens met richtlijnen | In welke mate volgt u de criteria op die gesteld worden in de richtlijn(en)?<br>Bent u het eens met de richtlijnen die u hanteert? Waarom wel/niet? |

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# Voorschrijfgedrag

Geachte lezer,

Mijn naam is Marjon Versteeg, masterstudent aan de Universiteit Twente. Ik doe een afstudeeronderzoek naar het voorschrijfgedrag van huisartsen en verpleeghuisartsen. Ik hoop op basis van de uitkomsten van dit afstudeeronderzoek inzicht te krijgen in mogelijke verschillen en/of overeenkomsten tussen huisartsen en verpleeghuisartsen in het voorschrijven van medicijnen aan ouderen en de mogelijke redenen hiervoor. Ik voer dit onderzoek uit binnen verpleeg- en verzorgingshuis 'Huize Maranatha' te Rijssen in samenwerking met Apotheek Kroonweide.
In het eerste deel van mijn onderzoek besteed ik aandacht aan de voorgeschreven medicijnen en in het tweede deel van het onderzoek zal ik ingaan op factoren die het voorschrijfgedrag kunnen beïnvloeden. Voor dit tweede deel zou ik graag een enquête af willen nemen over de verschillende factoren die van invloed zouden kunnen zijn op uw voorschrijfgedrag. Het invullen van de vragenlijst zal vijf tot tien minuten van uw tijd in beslag nemen.

Ik zou het zeer op prijs stellen wanneer u de enquête binnen twee weken invult.

Alvast mijn hartelijke dank.

Met vriendelijke groet,

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# Enquête medicatie voorschrijven

**Algemeen**

1. Geslacht:
   - o Man
   - o Vrouw

2. Leeftijd:
   - o …

3. Vakgroep:
   - o Huisarts
   - o Verpleeghuisarts

4. Aantal jaren ervaring binnen de zorg voor de oudere cliënt (65+):
   - o ……

5. Heeft u een geriatrische opleiding, scholing of bijscholing gevolgd?
   - o Ja
   - o Nee

6. Opleiding(en):
   - o …
   - o …

7. Heeft u zich verdiept in het voorschrijven van medicijnen aan de oudere patiënt (65+) en zo ja, op welke manier?
   - o Ja, …
   - o Nee

**Feedback apotheker**

8. Krijgt u wel eens feedback van een apotheker over interacties, doses en/of gebruiksduur van medicijnen?
   - o Ja
   - o Nee → ga door naar vraag 12

9. Kunt u aangeven hoe vaak u gemiddeld per maand feedback ontvangt over interacties, doses en/of gebruiksduur van medicijnen?
   - o 1-2 keer
   - o 3-4 keer
   - o 5 keer of vaker

10. In welke mate past u medicijnvoorschriften aan wanneer u feedback van de apotheker ontvangt over interacties, doses en/of gebruiksduur?
    - o Zelden of nooit
    - o Af en toe
    - o Redelijk vaak
    - o Erg vaak

11. Wat vindt u van de kwaliteit van de feedback die u van de apotheker ontvangt?
    - o …

**Medicatie beoordeling**

12. Heeft er in de afgelopen 12 maanden een medicatie beoordeling/ farmacotherapeutisch overleg van alle patiënten plaatsgevonden? Zo nee, waarom niet?
    - o Ja
    - o Nee, … → ga door naar vraag 15

13. Hoe vaak heeft er in de afgelopen 12 maanden gemiddeld een medicatie beoordeling/ farmacotherapeutisch overleg plaatsgevonden per patiënt?

- o …

14. In welke mate past u voorgeschreven medicijnen aan wanneer een wijziging ter sprake komt tijdens een medicatie beoordeling/ farmacotherapeutisch overleg?
    - o Zelden of nooit
    - o Af en toe
    - o Redelijk vaak
    - o Erg vaak

15. Waarom past u de voorgeschreven medicijnen juist wel/niet aan wanneer dit ter sprake komt tijdens een medicatie beoordeling/farmacotherapeutisch overleg?
    - o …

16. Vind u dat u voldoende tijd hebt u om het medicijngebruik van alle patiënten te herevalueren?
    - o Onvoldoende tijd
    - o Matig voldoende tijd
    - o Voldoende tijd
    - o Ruim voldoende tijd
    - o Genoeg tijd

**Leeftijd patiënten**

17. In welke mate maakt u gebruik van andere criteria/beweegredenen bij het voorschrijven van medicijnen aan de oudere patiënt (65+) in vergelijking met jongere patiënten?
    - o Zelden of nooit
    - o Af en toe
    - o Redelijk vaak
    - o Erg vaak

18. Op welke manier maakt u onderscheid tussen jongere patiënten en oudere patiënten?
    - o …

19. Zou u geneigd zijn eerder medicijnen voor te schrijven wanneer het om een oudere (65+) patiënt gaat, dan wanneer het om een jongere patiënt gaat? Waarom wel/niet?
    - o Ja, omdat
    - o Nee, omdat

**Verwachtingen/wensen patiënt**

20. Waartoe bent u het meest geneigd wanneer u merkt dat een patiënt medicijnen wenst/verwacht?
    - o Vrijwel zeker geen medicijnen voorschrijven
    - o Waarschijnlijk geen medicijnen voorschrijven
    - o Waarschijnlijk wel medicijnen voorschrijven
    - o Zeer waarschijnlijk wel medicijnen voorschrijven

21. Kunt u aangeven waarom u juist meer/minder geneigd bent medicijnen voor te schrijven wanneer u merkt dat een patiënt graag medicijnen wenst/verwacht?
        - o Meer geneigd tot voorschrijven, omdat ..
        - o Minder geneigd tot voorschrijven, omdat..

**Kosten**

22. In welke mate neemt u kosten van een medicijn mee bij de keuze voor een bepaald medicijn?
    - o Zelden of nooit
    - o Af en toe
    - o Redelijk vaak
    - o Erg vaak

**Hulpmiddelen/ criteria/richtlijnen**

23. Er zijn verschillende middelen die een handvat kunnen bieden bij het voorschrijven van de juiste medicijnen. Kunt u aangeven in welke mate u gebruik maakt van onderstaande middelen bij het voorschrijven van medicatie aan oudere patiënten?

| | Zelden of nooit | Af en toe | Redelijk vaak | Erg vaak |
|---|---|---|---|---|
| Richtlijnen voor het voorschrijven van medicijnen | | | | |
| Beers-criteria[1] | | | | |
| STOPP-criteria[2] | | | | |
| Anders | | | | |

24. Van welke andere hulpmiddelen/criteria maakt u gebruik bij het voorschrijven van medicijnen aan oudere patiënten?

25. Wanneer u gebruik maakt van bovenstaande hulpmiddelen, kunt u dan aangeven in welke mate u de criteria opvolgt die gesteld worden in het betreffende hulpmiddel?

| | Zelden of nooit | Af en toe | Redelijk vaak | Erg vaak | Niet van toepassing |
|---|---|---|---|---|---|
| Richtlijnen voor het voorschrijven van medicijnen | | | | | |
| Beers-criteria | | | | | |
| STOPP-criteria | | | | | |
| Anders | | | | | |

26. Wanneer u gebruikt maakt van richtlijnen, kunt u dan aangeven van welke richtlijnen u gebruik maakt bij het voorschrijven van medicijnen aan oudere patiënten?
    - o …
    - o …

27. Bent u het eens met de richtlijnen die u hanteert? Waarom wel/niet?
    - o …

*Wanneer u (een van) onderstaande hulpmiddelen niet kent, dan mag u de bijbehorende vraag overslaan.*

28. Bent u het eens met de Beers-criteria? Waarom wel/niet?
    - o **…**

29. Bent u het eens met de STOPP-criteria? Waarom wel/niet?
    - o …

30. Zijn er nog andere, niet eerder genoemde factoren waarvan u denkt dat ze van invloed zijn op het voorschrijven van medicijnen aan oudere patiënten? Zo ja, zou u deze kunnen specificeren?

31. Opmerkingen:

[1] De Beers- criteria is een lijst met mogelijk ongepaste medicijnen voor oudere mensen, de criteria zijn ontwikkeld door Beers en collega's voor verpleeghuisbewoners (Beers et al. 2002).

[2] De STOPP (Screening Tool of Older Persons' potentially inappropriate Prescriptions) criteria zijn een set van mogelijk ongepaste medicijnen in oudere mensen. De STOPP criteria zijn gebaseerd op vaak voorkomende mogelijk ongepaste medicijnen en zijn opgesomd volgens fysiologische systemen (Hamilton et al. 2011).