Chapter 1

Scope, objective and setting
1.1 Scope and objective

Introduction

Drug utilisation in the elderly has been subject of many studies [1-4]. In the Netherlands, people aged 65 and over comprise about 14% of the Dutch population and account for 40% of the drug prescription costs spent in hospital and community pharmacies [5]. Multiple chronic conditions and the fact that the possibilities for both preventive and therapeutic medical therapies for many diseases have increased in recent years, contribute to the high frequency of drug use in the elderly. The prescribing of a drug to counteract adverse effects of another drug (‘prescribing cascade’) may further increase drug use in the elderly [6].

In view of multiple co-morbidity, changes in drug kinetics and effects and the prescription of several drugs simultaneously (polypharmacy), elderly people are at an increased risk of drug-related problems such as drug-drug interactions, drug-disease interactions and adverse drug reactions (ADRs) [7]. The prevalence of ADRs ranges from 1.5 to 44% in elderly inpatients and from 2.5 to 50.6% in elderly outpatients [8]. Examples of age-related risks of ADRs are bleeding from oral anticoagulants and gastropathy associated with non-steroidal anti-inflammatory drugs [9]. Apart from the risk of overprescribing in this group [6,10], underprescribing of effective agents, such as statins, may also be harmful to the elderly [11-13]. Also, underdiagnosing of certain diagnoses, such as depression, is reported to be an issue in the elderly [14]. Despite the awareness of the problems associated with drug use in the elderly and the attention that has been given to rational prescribing, the frequency of drug-related hospital admissions among elderly people aged 65 and over is still considerable [15-17]. The incidence of drug-related problems is reported to be even higher in nursing home patients, due to the higher levels of drug use and the complexity of the conditions these patients are cared for [18,19].

Physicians are faced with a complex task when prescribing to elderly people [20-22]. Advanced age leads to increased frailty and altered pharmacokinetics and pharmacodynamics with large interindividual variability, often leading to unpredictable drug responses [23]. Elderly people are mostly not included in randomised clinical trials, both because of age and co-morbidity [24], and as a result information on efficacy, optimum drug dosages and toxicity are frequently lacking in this vulnerable age group [25,26]. Also, in daily clinical practice the circumstances, under which drugs are used, especially in the elderly, differ from those in randomised clinical trials. In view of the considerations mentioned above, prescribers need a thorough understanding of the risks, benefits and consequences of drug therapy in the elderly.
especially the frail elderly. By studying the uses and effects of drugs in this population in daily clinical practice such insight into these matters can be obtained. In particular in nursing homes, where frail elderly people reside with often high levels of drug use, and where adverse drug effects may lead to serious clinical consequences, it is useful to perform pharmacoepidemiologic studies. In the United States many such studies have been carried out, addressing three main issues: the measurement, determinants, and outcomes of drug use. The structure and organisation of Dutch nursing homes and the type of residents that is cared for, differ considerably from those in other European countries and the United States [27]. As a consequence, the concern that has been expressed in the United States regarding the excessive and inappropriate use of drugs in nursing homes, especially psychotropics [28], cannot automatically be applied to Dutch nursing homes.

Relatively few drug utilisation studies in Dutch nursing homes have been carried out. Several reasons may account for this fact. First, the medical speciality ‘nursing home medicine’ is the youngest of the 34 medical specialities in the Netherlands and has been acknowledged as an official medical speciality since 1990. In view of this short history, the extent of research in this speciality is relatively small. Second, the nursing home population in the Netherlands mainly consists of frail elderly patients. In this group ethical aspects, although this is not typically a Dutch issue, therefore may play a role. Ethical and practical questions arise when the value of certain medical interventions is assessed, such as the withdrawal of benzodiazepines. Furthermore, studies on clinical relevant outcomes are often lacking due to ethical considerations. A third reason why studies on drug use in Dutch nursing homes have not been performed more extensively, is that until the 1990s medication use on individual patient level was only registered in the medical chart and not in pharmacy computer systems. Only in the last decade, medication registration on individual patient level in computerised systems is more common. Performing pharmacoepidemiologic studies, which often requires large datasets, has therefore not been feasible until recent years.

**Objective and outline of the thesis**

The objective of this thesis is to provide insight in drug use, determinants of drug use and outcomes of drug use in the elderly and in particular in the frail elderly that reside in Dutch nursing homes. The studies that provide this information may lead to a better understanding of the risks of drug use in the (institutionalised) elderly and may serve as a starting point to improve prescribing practices. Furthermore, the results of these investigations may provide the tool for monitoring individual patients at risk for drug-related problems. In chapter 1 the objective and outline of the thesis are given. Furthermore, background information is given into the setting of the studies presented in this thesis. Chapter 2 describes drug use and determinants of drug use in nursing home patients and elderly outpatients. A description is given of the pharmacy prescription data that were collected from 6 nursing homes. These data comprised the main dataset used throughout this thesis. Several drug utilisation studies were performed with this dataset. Prescribing indicators were used with the aim to study drug use systematically. Furthermore, using prescription data from the InterAction database, we investigated drug use in elderly outpatients, focusing on psychotropics and non-steroidal anti-inflammatory drugs. Chapter 3 describes studies that focus on the outcome of drug use in both nursing home patients and elderly outpatients. In chapter 4, the main findings of the studies are discussed and suggestions for clinical practice are given.
References

1.2 Setting

Ambulatory elderly

The Dutch health care system is geared to facilitate elderly people (aged 65 and older) to live at home for as long and as independently as possible. Eighty-two percent of the people aged 65 and over live independently in the community [1]. Most people have healthcare insurance, which covers the costs of primary care and medication as well as the costs of in-hospital and outpatient treatment. In addition, every Dutch citizen is insured under the Exceptional Medical Expenses Act (AWBZ). This act provides the general public with insurance for health risks not covered by normal healthcare insurance, such as admission to nursing homes and residential homes and the costs of home care (e.g. meals-on-wheels and household help) [1].

General medical care is provided through general practitioners and pharmacies providing primary care services. In the Netherlands, more than 90% of healthcare problems are dealt with in primary care. General practitioners can refer patients to 143 hospitals (with almost 60,000 beds). Every academic hospital and each large teaching hospital (approximately 17 in total) has a specialised geriatric department, together with clinical geriatric teaching and research facilities [1]. In other non-teaching hospitals separate ‘Geriatrische Afdeling Algemeen Ziekenhuis’ (GAAZ)-departments are present, providing medical care for geriatric patients.

In recent years, several initiatives have been issued towards improvements in quality of life of elderly people. Increasingly, attention has been given to quality of drug use. In Dutch community pharmacies, pharmaceutical care is gradually implemented in daily community practice [2]. Community pharmacists have addressed some of the problems of medication use in the elderly and have given suggestions for improvement [3]. Internationally, several studies have focused on pharmaceutical care. In a multicenter international study performed in 7 European countries, it was found that community pharmacy-based provision of pharmaceutical care improved the well-being of elderly patients [4]. Patients reported better control of their medical conditions and cost savings associated with pharmaceutical care provision were observed in most countries. In a 12-month controlled intervention study it was found that community pharmacy-based interventions improved lung function, health-related quality of life, and self-management in asthma patients [5].

Several secondary medical care services are provided on an outpatient basis, such as the home visits of the Outpatient Thrombosis Services throughout the country to monitor oral anticoagulant therapy by measuring the prothrombin times. Home care organisations provide tailormade services for elderly people in need of continuous medical care, such as a daily need of dressing renewals or continuous pain relief. When the need for medical care becomes such that people cannot live totally in their own home anymore, admission into residential homes or nursing homes is possible on strict medical indication and depending on the amount of care needed. Regional pre-selection boards carry out assessment of eligibility for care in nursing homes and residential homes. However, no measuring instrument has been able to assess the need for care objectively and in a standardised way that is universally applicable [6].

Institutionalised elderly

In the Netherlands, of the people aged 65 and over 5.5% live in residential homes and 2.7% live in nursing homes [1]. Residential homes offer board, lodging and care to elderly who are no longer able to cope on their own. These homes do not offer nursing. Medical care is provided by the residents’ general practitioner and medication is provided by the residents’ community pharmacy. There are 1425 residential homes in the Netherlands, with a total of 117,500 beds (55 per 1000 inhabitants aged 65 and over) [1]. The Dutch nursing home is a healthcare institution for chronically ill persons in need of permanent medical and paramedical attention and complex nursing care and is compared to skilled nursing facilities in the US [1]. The type of care can be characterised as continuous, long-term, systematic and multidisciplinary [7]. Several features make them different from nursing homes in other countries. First, clear criteria based on medical diagnoses, activities of daily living, behavioural characteristics and mental functioning for nursing home admission exist. On the basis of these criteria, a distinction is made between eligibility for admission and whether people should be admitted to either a somatic nursing home or a psychogeriatric nursing home. Residents with predominantly psychogeriatric disorders (mainly dementia) are cared for in psychogeriatric nursing homes, whereas in somatic nursing homes people with predominantly somatic disorders, such as Parkinson’s disease or diabetes mellitus, reside. Often, psychogeriatric care and somatic care is provided in the same nursing home, and the division between the two types of care is between wards. Second, the way care is provided in Dutch nursing homes is markedly different from other countries. For instance, specially trained nursing home physicians provide medical care on a continuous basis. This medical speciality requires a two-year postgraduate academic education. In other countries, medical care in nursing homes is provided by general practitioners, mostly on an on-demand basis and not continuously. Furthermore, in the Netherlands, care is provided by a multidisciplinary team, in which nursing home physicians (1 full-time doctor per 100 residents), nurses, physical therapists, speech therapists, and psychologists closely colla-
borate. Medical specialists, such as neurologists and psychiatrists, provide specialised medical care on consult basis. There are 330 nursing homes in the Netherlands, with a total of 57,000 beds (27 per 1000 inhabitants aged 65 and older) [1]. As mentioned earlier, all nursing home admissions are financed by the AWBZ. The AWBZ reimburses about 98% of all nursing homes expenses. In addition to addressing financial stability issues, this act regulates the care standards for this sector, monitored by regional health inspectors. Another act that relates to quality issues in nursing homes is the ‘Care Institutions Quality Act’ (Kwaliteitswet Zorginstellingen). This act aims at adequate quality assurance in health care institutions.

Either community pharmacists or hospital pharmacists can provide the distribution of medicines in Dutch nursing homes. To investigate the quality of the medication distribution process and other pharmaceutical activities, in 1997 the Dutch Health Care Inspectorate held a survey among 33 nursing homes. About half of these nursing homes were served by a hospital pharmacy, the other half by a community pharmacy. It was concluded that quality aspects should be more incorporated in the medication distribution processes. The pharmacist should play a more profound role in the pharmaceutical care to nursing home residents, such as participation in drug and therapeutics committees, evaluation of prescribing on patient level, and regular updates of drug formularies [8]. As a result of this survey, a ‘Guideline Pharmaceutical Care in Nursing Homes’ was drafted in 1998 [9]. This guideline describes how pharmaceutical care by the pharmacist in nursing homes is best performed, and serves as a guideline for implementing quality assurance processes. For both economic and therapeutic reasons, a drug formulation is used in almost every Dutch nursing home, constituting of a limited list of preferred medications. In several Dutch nursing homes, drug therapy issues are regularly discussed in Pharmacotherapy Discussion Groups, in which both nursing home physicians and pharmacists participate. For certification, these meetings should be held at least 6 times a year. Studies addressing the quality of pharmaceutical care in nursing homes have not been performed extensively. Mainly this work has been carried out in the United States [10,11], but in recent years European studies also focus on this issue [12-16].

References