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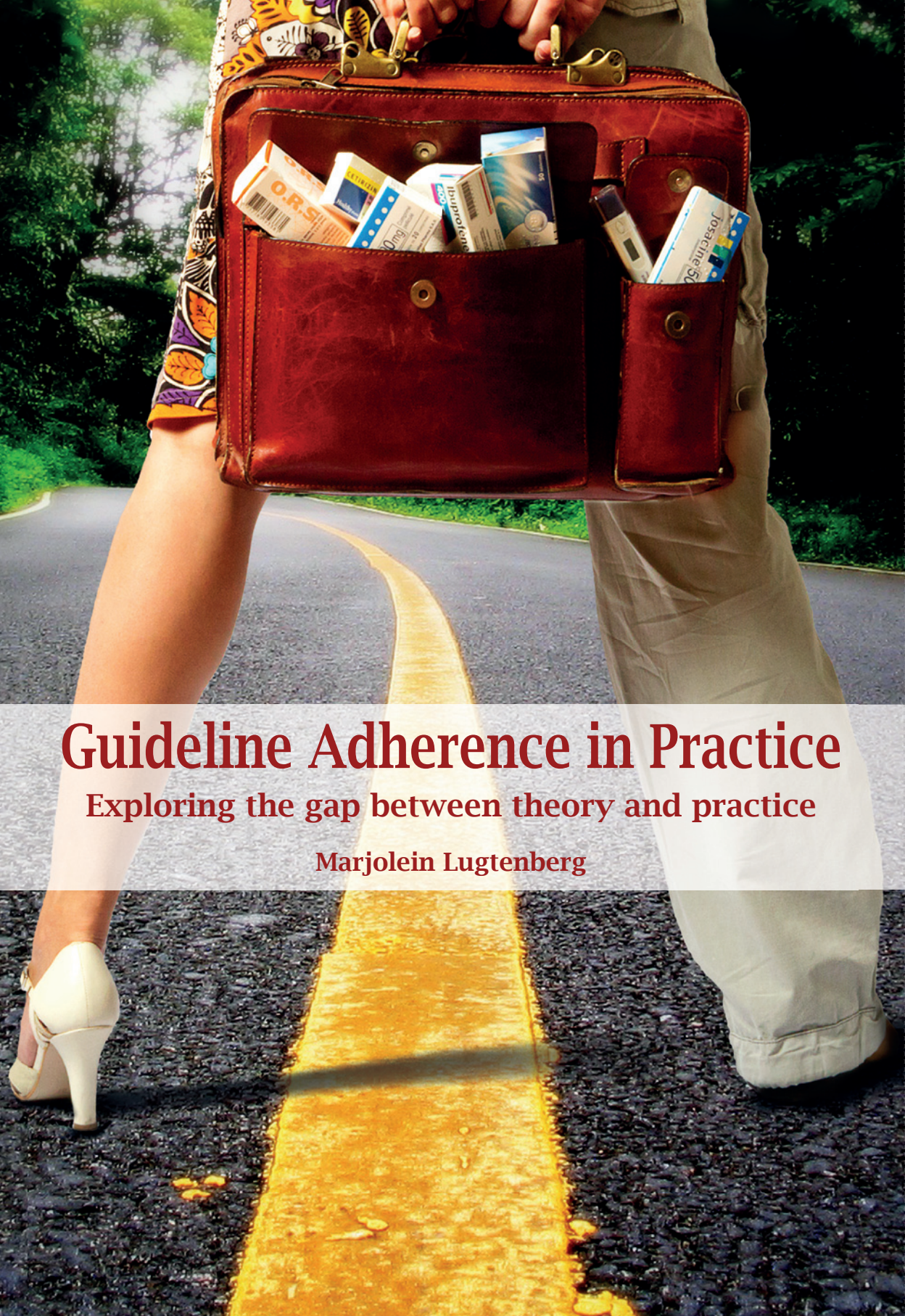
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Guideline Adherence in Practice

Exploring the gap between theory and practice

Marjolein Lugtenberg

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Guideline Adherence in Practice

Exploring the gap between theory and practice

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aan de Universiteit van Tilburg

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A grayscale photograph of a person from the waist down, walking on a paved path. The person is wearing a patterned dress and white high-heeled shoes. They are carrying a large black bag that is overflowing with various medicine boxes and bottles. Some of the visible text on the medicine boxes includes "OR-", "RETARD", "Dmg", "Dantrolen", and "Josacilin 50". The background shows a paved path with a white line, and some trees and foliage are visible in the distance.

Chapter 1

General Introduction

Background

Healthcare professionals are confronted with increasing demands to deliver high-quality care. For physicians, it is necessary to be informed about the best available evidence and to keep their knowledge up to date. However, the production of new findings in the field of patient care is progressing at an increasing pace, making it impossible for individual physicians to keep up to date ¹. Hence, there is a need to condense information and to translate the knowledge into tools supporting decision making in clinical practice, with the potential to optimise the quality of clinical care.

Clinical practice guidelines as tools to optimise quality of care

Clinical practice guidelines (CPGs) are regarded as useful tools to provide effective and efficient care ². They can be defined as “*systematically developed statements to assist practitioner and patient decisions about appropriate healthcare for specific clinical circumstances*” ^{3, 4}. The primary focus of guidelines is to improve the quality of care. CPGs can also be considered as a reflection of the current state of knowledge for both professionals and patients ⁵. By translating the best available evidence into specific recommendations for clinical practice, they can facilitate the uptake of new research findings and insights into clinical practice ⁵. The underlying assumption is that the provision of the best available evidence to healthcare professionals leads to optimal decisions in clinical practice and thus to optimal care.

Within the last three decades many guidelines have been developed, covering a variety of conditions and diseases in all areas of medicine. In 1977, the National Institutes of Health (NIH) in the United States became the first organisation to develop consensus statements, which can be considered as precursors of clinical practice guidelines ⁶. Around the same time, clinical guideline development became active in Canada. The consensus-development method was gradually adopted by more countries, including European countries such as Sweden, the Netherlands, Denmark, and the UK. This resulted in a clinical guideline movement in the 1990s when almost all western

countries became active in the development of CPGs ^{7, 8}. Whereas guidelines were initially based on consensus among experts, guideline development gradually formalised and evidence-based guidelines - linking the individual recommendations with their supporting evidence - became standard practice ⁹.

Guidelines and the Dutch context

Compared to other European countries, the Netherlands was a forerunner in guideline development ¹⁰. The two most prominent guideline organisations in the Netherlands that have long-standing experience with guideline development are the Dutch College of General Practitioners (NHG) ¹¹ and the Dutch Institute for Healthcare Improvement (CBO) ¹². Both organisations work according to the principles of evidence-based guideline development ⁹.

Traditionally, the NHG focused on primary care, whereas the CBO developed guidelines for secondary and hospital care. Thus far, the NHG has developed more than 90 guidelines for general practitioners (GPs) and a majority of them have been updated repeatedly ¹¹. Since 1981, CBO has developed guidelines on more than 130 different clinical topics ¹². In 2010, CBO was taken over by TNO Management Consultants, but it will continue producing CPGs under the brand name CBO. In the last decade, however, other organisations have also become active in guideline development, such as the Dutch Order of Medical Specialists (Orde van Medisch Specialisten), the Netherlands Institute of Mental Health & Addiction (Trimbos institute), the Dutch Association of Comprehensive Cancer Centres (ACCC), the Netherlands Centre for Excellence in Nursing (LEVV), and the Royal Dutch Society for Physical Therapy (KNGF).

Gap between theory and practice

Despite widespread distribution and promotion of clinical practice guidelines, adherence to guidelines in practice among physicians is often not optimal. A comprehensive study among Dutch GPs (n=195), showed that GPs did not prescribe drugs according to the guidelines in approximately one-third of the cases ¹³. Additionally, levels of adherence varied largely between practices and diagnoses ¹³. For example, guidelines on urinary tract infections (UTI) were on average followed in 42% of the cases, but levels of adherence varied from 0 to 95% between practices ¹³.

As opposed to primary care, few comprehensive studies have been conducted to examine the use of guidelines among Dutch specialists. A survey conducted in 2003 among Dutch medical specialists showed that about half of the specialists reported to use guidelines in practice ¹⁴. Other studies focusing on guideline adherence among Dutch specialists showed varying levels of adherence ¹⁵⁻¹⁷, as well as large practice variations between hospitals in the Netherlands ¹⁸. Modest levels of adherence to guidelines have been found in other countries as well. A comprehensive study in the U.S. showed that on average only approximately half of the patients (55%) received recommended care as described in the guidelines ¹⁹. In addition, unwarranted practice variation is regarded as a ubiquitous feature of U.S. health care ²⁰.

Although guideline adherence among physicians is not optimal, several international reviews have demonstrated that clinical guidelines can in fact improve clinical practice and patient care ²¹⁻²³. These reviews showed that the majority of studies demonstrated significant improvements with respect to the process of clinical care, indicating that guidelines can promote adherence to recommended practices. Compared to research focusing on the effects of guidelines on clinical practice, fewer studies examined the effects of guidelines on patient health outcomes and the evidence is inconclusive. In two reviews some effect was found ^{21, 24}, whereas another review found little support that guidelines contributed to improved patient health outcomes ²⁵. However, many of the studies included in these reviews used guidelines that were not developed according to the principles of evidence-based medicine ²⁵.

Barriers to guideline adherence among physicians

Several systematic reviews have shown that a large number of barriers may contribute to guideline non-adherence ²⁶⁻²⁸. These barriers can be active at different levels, such as at the level of the practitioner, patient, organisational context, or social and cultural context ²⁹⁻³².

The well-known framework of barriers to guideline adherence of Cabana et al ²⁶ classifies the identified barriers into three main categories: barriers related to knowledge, barriers related to attitudes, and barriers related to behaviour. With respect to knowledge, barriers due to lack of awareness and lack of familiarity with the guideline are distinguished. Barriers related to attitudes include lack of agreement with the guideline, lack of outcome expectancy, lack of self-efficacy, and lack of motivation. External barriers can be divided into patient-, guideline- and environmental factors.

Several studies have explored physicians' attitudes towards guidelines in general as a possible barrier to guideline usage ³³⁻³⁸. Other barrier studies focused on a single guideline that focused on a specific disease or condition e.g. ^{39, 40}. In addition, barriers are often identified and analysed at the level of the guideline as a whole rather than at the level of the individual recommendations within guidelines e.g. ^{26, 40}.

Interventions to improve guideline adherence among physicians

Several types of interventions can be used to facilitate the implementation of guidelines and help overcome barriers to their adoption in clinical practice. These include professional oriented interventions (e.g. distribution of educational materials, reminders and feedback), financial interventions (e.g. pay for performance, patient incentives), organisational interventions (e.g. changes in the practice setting, availability of resources and materials) and regulatory/coercive interventions (changes by law and legislation) ⁴¹⁻⁴³.

Reviews on the effectiveness of different interventions suggest that, although some interventions seem to be more effective than others, no single strategy is superior in all settings^{30, 44, 45}. It is recognised that a mere dissemination of guidelines is not enough and that more active strategies are needed to improve guideline adherence^{44, 46-48}. Moreover, for an intervention to be successful it is important to take into account all relevant barriers that play a role at different levels^{29, 30}. Therefore, a combination of interventions addressing barriers at various levels is often required for effective implementation^{30, 44}. Multifaceted interventions, however, do not always yield more effect than single ones^{49, 50}. A conclusive answer as to which interventions are most effective in which situations is thus far lacking. The importance of performing a ‘diagnostic analysis’ of the target setting and the needs and views of the target group to determine what type of strategy may be successful is increasingly being recognised^{29, 51}.

Many implementation studies have been conducted in the last decade. It is generally accepted that implementation interventions should be tailored to the specific barriers to guideline adherence and other features of the target group and setting^{30, 52, 53}. However, in practice the choice of an intervention is often based on personal preferences of the researchers or familiarity with specific interventions^{52, 54}, rather than on the outcomes of a systematic analysis of barriers⁵⁵. Interventions are often multifaceted, but not tailored to barriers. Moreover, the target users are usually not involved in selecting interventions to improve guideline adherence⁵⁶.

To summarise, the number of guidelines has grown enormously in the last two decades. Nevertheless, the individual adherence to guidelines among physicians is not optimal and the impact on patient outcomes is uncertain. In other words, while guidelines aim to bridge the gap between theory and practice, in reality they create a new gap since they do not implement themselves⁶.

This thesis: the GAP study

This thesis focuses on the gap between guidelines and clinical practice and describes the results of the so-called GAP study (*Guideline Adherence in Practice*)¹. The main objective of this study is to generate knowledge about the gap between the availability of a wide range of guidelines and their limited uptake in clinical practice and to provide recommendations about bridging this gap (see Figure 1).

By conducting a set of qualitative as well as quantitative studies we aim to identify the barriers that physicians perceive in adhering to recommendations in current guidelines and to explore which interventions could be used to address these barriers. In contrast to most other studies, the GAP study focuses on the level of key recommendations rather than guidelines as a whole. This is true both for identifying barriers as well as for identifying interventions to address these barriers. In addition, in designing interventions to improve guideline adherence, we aimed for active involvement of the target group instead of a top down approach. A better understanding of the gap between guidelines and practices may contribute to the development of more effective guideline implementation plans and, ultimately, to improved patient care.

The terms ‘clinical practice guidelines’, ‘practice guidelines’, ‘guidelines’ and ‘CPGs’ are considered as synonyms in this thesis.

¹ The GAP study (*Guideline Adherence in Practice*) started in 2007 and is conducted by Tranzo, Tilburg University in cooperation with Stichting KOEL (www.stichtingkoel.nl), a foundation responsible for continuing medical education (CME) for GPs in the South Western part of the Netherlands. The aim of this study is to gain insight into the gap between theory and practice. By conducting several qualitative and quantitative studies among Dutch GPs, the GAP study aimed to identify barriers to guideline adherence and useful interventions to address these barriers.

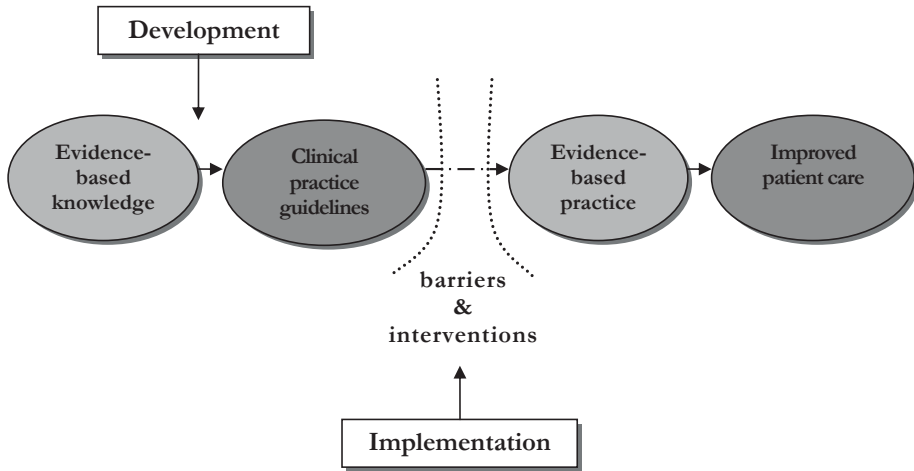


Figure 1 - Basic research model

Research objectives

The specific research objectives of this thesis are as follows:

1. To assess the effects of guidelines on quality of care with regard to structure, process and outcomes of care.
2. To identify perceived barriers among physicians (GPs, medical specialists) in adhering to guidelines in practice.
3. To explore appropriate and well-accepted interventions among physicians from the target group that address these barriers, in order to improve guideline adherence in practice.

Thesis outline

The thesis starts with a systematic review of the literature on the effects of evidence-based guidelines on quality of care in the Netherlands (**Chapter 2**). Both the effects of guidelines on the structure and process of care as well as the effects of guidelines on patient outcomes are described in this review.

Chapter 3 explores the barriers that Dutch GPs perceive in adhering to a diverse set of national guidelines for general practice. We conducted six qualitative focus group sessions in which twelve national guidelines and 56 recommendations were discussed, aiming to provide an overview of the range of barriers that GPs perceive in adhering to guideline recommendations in practice.

In **Chapter 4** we present the findings concerning one of the guidelines addressed in the focus group study in more detail, i.e. the guideline on uncomplicated urinary tract infections (UTI). This chapter provides an in-depth understanding of the barriers that GPs perceive in adhering to the key recommendations of this guideline and discusses the suggested interventions to address these barriers.

Chapter 5 focuses on barriers to adherence to guidelines in specialist care. Based on a survey among Dutch dermatologists, we describe the knowledge related, attitude related, and external barriers that they perceive in adhering to the guidelines for the treatment of moderate to severe plaque psoriasis.

Chapter 6 elaborates on one of the barriers that Dutch GPs perceive in adhering to guidelines in practice, which is lack of applicability due to comorbidity. We systematically assessed the content of an international sample of evidence-based guidelines in terms of addressing comorbidity as well as the underlying evidence of the comorbidity-related recommendations. Based on this analysis, conclusions are drawn on the extent that current guidelines are applicable to patients with comorbid conditions.

Chapter 7 presents the findings of a survey study among Dutch GPs assessing the perceived barriers to guideline adherence. Whereas the perceived barriers were explored qualitatively in Chapter 3 and 4 of this thesis, in this chapter these results are quantified by describing the relevance of each of the barriers in adhering to recommendations of a diverse set of guidelines in practice.

Chapter 8 addresses GPs' preferences for interventions to improve guideline adherence in practice and describes whether these preferences differ across recommendations in guidelines.

Finally, in **Chapter 9**, the main findings of this thesis are summarised and discussed, followed by the methodological considerations of this study as well as the implications of the findings for guideline development, implementation, policy makers, clinical practice and future research.

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Chapter 2

Effects of evidence-based guidelines on quality of care: a systematic review

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Quality and Safety in Health Care, 2009, 18(5): 385-392.

Abstract

Background: Evidence-based clinical guidelines aim to improve the quality of care. In The Netherlands, considerable time and effort have been invested in the development and implementation of evidence-based guidelines since the 1990s. Thus far, no reviews are available on their effectiveness. The primary aim of this article was to assess the evidence for the effectiveness of Dutch evidence-based clinical guidelines in improving the quality of care.

Methods: A systematic review of studies evaluating the effects of Dutch evidence-based guidelines on both the process and structure of care and patient outcomes was conducted. The electronic databases Medline and Embase (1990–2007) and relevant scientific journals were searched. Studies were only selected if they included a controlled trial, an interrupted time series design or a before and after design.

Results: A total of 20 studies were included. In 17 of 19 studies that measured the effects on the process or structure of care, significant improvements were reported. Thirteen of these studies reported improvement with respect to some of the recommendations studied. In addition, the size of the observed effects varied largely across the recommendations within guidelines. Six of nine studies that measured patient health outcomes showed significant but small improvements as a result of the use of clinical guidelines.

Conclusions: This review demonstrates that Dutch evidence-based clinical guidelines can be effective in improving the process and structure of care. The effects of guidelines on patient health outcomes were studied far less and data are less convincing. The high level of variation in effects across recommendations suggests that implementation strategies tailored to individual recommendations within the guideline are needed to establish relevant improvements in healthcare. Moreover, the results highlight the need for well-designed studies focusing on the level of the recommendations to determine which factors influence guideline utilisation and improved patient outcomes.

Background

Increasingly, clinical practice guidelines (CPGs) are being developed in all areas of medicine as a means to improve the quality of care. By translating the best available scientific evidence into specific recommendations, guidelines can serve as useful tools to achieve effective and efficient patient care ¹. Whereas guidelines initially were based on consensus among experts, guideline development has been gradually formalised and evidence-based guidelines - linking the individual recommendations with their supporting evidence - are becoming standard practice ². Developing evidence-based guidelines, however, does not guarantee improved quality of care. Effective implementation should ensure guideline adherence in practice and subsequently lead to improved patient outcomes.

Studies measuring the effects of guidelines on quality of care have predominantly focused on effects on clinical practice. Several international reviews showed that the majority of guideline studies resulted in significant improvements with respect to the process of care ³⁻⁵. Fewer studies have focused on the effects of guidelines on patient health outcomes. One review indicated improved patient health outcomes ³, whereas a second review, focusing on primary care, did not find a positive effect ⁶. However, most of the studies that were included in these reviews used older guidelines that were not developed according to the current standards of evidence-based medicine ⁷.

Guideline utilisation is complex and many factors may influence the impact of guidelines on care. Factors linked to the guideline itself are the strength of the evidence ^{8,9}, the method of development and transparency of the guideline ¹⁰ and the perceived adoptability, complexity and triability of the recommendations ^{11, 12}. Apart from guideline factors, the nature of the implementation strategy can contribute to guideline utilisation. Passive strategies, such as educational material and meetings, generally have a small effect and multifaceted strategies are not necessarily better than single interventions ^{1,13}. Finally, contextual, organisational and cultural factors may impede or limit guideline adoption regardless of how thoroughly they are implemented ^{14,15}.

The Netherlands has been a forerunner in evidence-based guideline development and guideline implementation research, compared with other European countries ¹⁶. Since 1982, more than 200 guidelines have been developed by the Dutch Institute for Healthcare Improvement (CBO) and the Dutch College of General Practitioners (NHG), the two most prominent guideline organisations in The Netherlands. Historically, the CBO focused on secondary care and the NHG on primary care, since there is a clear-cut distinction between primary and secondary care in the Dutch healthcare system. In the last decade, other organisations have also become active in guideline development. Partly because of the role of the Centre for Quality of Care Research (since June 2008 Scientific Institute for Quality of Healthcare), many implementation studies have been conducted to measure the effectiveness of the Dutch guidelines ¹⁶.

In spite of a considerable investment in the area of evidence-based clinical guidelines in The Netherlands, thus far, it is unclear to what extent these activities have been successful in improving compliance with guidelines and patient health outcomes. By examining the impact of evidence-based guidelines in a country the size of The Netherlands, which features well-defined organisations responsible for guideline development, unique observations can be made. The primary aim of this study is, therefore, to provide an overview of the effectiveness of Dutch evidence-based guidelines in improving the quality of care. In addition, we want to explore which factors are associated with guideline utilisation and improved patient outcomes.

Methods

Concepts and definitions

In this review, CPGs were defined as “systematically developed statements to assist practitioner decisions about appropriate healthcare for specific clinical circumstances” ¹⁷. Guidelines that use the results of systematic literature reviews in formulating the recommendations and that link the individual recommendations with their supporting evidence were regarded as evidence-based CPGs. A recommendation was defined as

“any statement that promotes or advocates a particular course of action in clinical care”¹⁸.

Implementation was defined as “a planned process and systematic introduction of innovations or changes of proven value; the aim being that these are given a structural place in professional practice, in the functioning of organisations or in the health care structure”¹⁹. Dissemination, on the other hand, is regarded as more passive than implementation and involves strategies such as distributing guidelines or publication of guidelines in scientific journals.

To evaluate effects on quality of care, we used Donabedian’s model, which distinguished the structure, processes and outcomes of care²⁰. Structure of care refers to “human, physical and financial resources that are needed to provide medical care” (eg, the presence of spirometry in general practice)²¹. Process of care refers to “the set of activities that go on within and between practitioners and patient” (eg, prescription of medication)²¹, whereas “the change in a patient’s current and future health status that can be attributed to antecedent health care” (eg, blood pressure) is defined as outcome of care²¹.

Search strategy

A systematic literature search was conducted in Medline, Embase and relevant Dutch scientific journals. Searches were performed in Medline and Embase of literature published from 1990 to May 2007 using several combinations of key-words (Appendix 1). We did not include studies published before 1990, as evidence-based guideline development in The Netherlands started in the early 1990s. To identify Dutch-language publications we performed a sensitive search in Medline (1990–2007) with the free text word “guideline*”, limited to Dutch language. In addition, two relevant Dutch scientific journals, *Huisarts & Wetenschap* and *Nederlands Tijdschrift voor de Geneeskunde*, were searched for additional studies.

Two reviewers (ML and JB) independently screened the titles and abstracts of the articles and selected 163 potentially relevant articles. Discrepancies were resolved by

discussion and consensus. These articles were further selected according to the following inclusion criteria (fig 1).

(1) The study concerned (a) clinical Dutch guideline(s). Drug formularies, patient guidelines and European guidelines were excluded.

(2) The study addressed the adherence to recommendations related to the process and structure of care and/or the effects of guidelines on patient health outcomes.

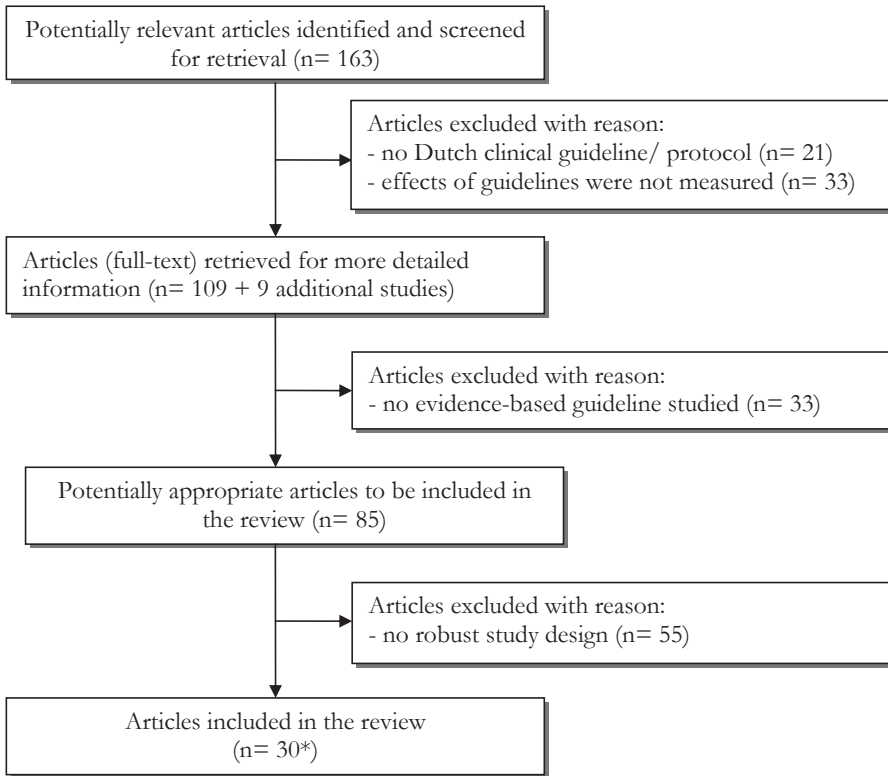
(3) The study concerned (an) evidence-based guideline(s). Local or regional protocols and guidelines that were derived from evidence-based national guidelines were also included.

(4) The study included a controlled trial (randomised controlled trial, controlled clinical trial), an interrupted time series or a before and after design. Studies that evaluated the effectiveness of different guideline dissemination and implementation strategies were included as well as studies that measured the effect of a guideline against a non-intervention control group.

In addition, we consulted reference lists from all articles that were retrieved for more detailed information.

Data extraction

Three categories of studies were distinguished based on the target users of the guideline(s): (1) general practitioners; (2) medical specialists and (3) other healthcare providers, such as physiotherapists and midwives. The following data were collected from each study: type of guideline (national or local/ regional); clinical area; setting; study design; number of included patients and physicians; type of intervention; process and structure measures; patient outcome measures; effects on process and structure of care; and effects on patient health outcomes.



* 30 articles referring to 20 different studies

Figure 1 – Flow diagram of study selection process (QUOROM)²²

Methodological quality

The methodological quality of the eligible studies was assessed by one reviewer (ML) and checked by a second reviewer (JB) using the quality criteria of the Cochrane Effective Practice and Organisation of Care Group (EPOC)²³. The EPOC quality criteria checklist includes seven criteria for randomised controlled trials, seven criteria for controlled before and after studies and seven criteria for interrupted time series. Although the EPOC criteria were not developed to assess the methodological quality of uncontrolled before and after studies, we used them for these studies as well, since there are no high-quality checklists available to measure the quality of these type of

studies. The quality criteria, such as concealment of allocation, follow-up of professionals and follow-up of patients or episodes of care, were scored as “done”, “not done”, “not clear” and in some cases as “not applicable”.

Data synthesis

Due to the heterogeneity of the studies, pooling of the results and calculating an overall estimate of the effects were not possible. Instead, we summarised the effectiveness in three categories: mostly effective (if the study demonstrated a significant effect on more than half of the outcome measures), partly effective (if the study reported a significant effect on half or less than half of the outcome measures) and not effective (if no significant effect was demonstrated). If a study evaluated the effectiveness of different guideline dissemination and implementation strategies, effectiveness was determined by the observed significant improvement in either of the study groups, rather than by a significant improvement in the intervention group compared with the control group.

Results

Description of the studies

Setting, study design and type of intervention

Thirty articles referring to 20 different studies fulfilled the inclusion criteria and were included in the selection. Most of the included studies targeted general practitioners (table 1) ^{24–44}. Three studies were conducted among medical specialists ^{45–47} and four studies targeted other healthcare providers ^{48–53}.

The majority of the studies concerned guidelines that had been developed at the national level ^{24–29, 31, 32, 34–45, 47–50}. Most studies focused on diagnosis and treatment ^{24, 31–33, 38–40, 43–50, 53}, while five studies concerned preventive care ^{25–30, 42} and three a combination of both ^{34–37, 41, 51, 52}. The most common studied medical conditions were cardiovascular diseases, influenza, diabetes mellitus type II, low-back pain, asthma and COPD.

Most of the studies were cluster randomised controlled trials ^{24, 33–37, 40, 41, 43, 44, 46, 49, 50, 53}. The studies used predominantly multifaceted intervention strategies to implement the guide-line(s) ^{24–29, 31–44, 46, 47, 49–53}. The intervention strategies most often used as part of multifaceted interventions were educational meetings, distribution of educational material, and audit and feedback.

Table 1 - Characteristics of included studies (n = 20)

	No
Type of healthcare provider	
General practitioners	13
Medical specialists	3
Other healthcare providers	4
Type of guideline	
National	15
Regional/local	5
Subject of study	
Preventive care	5
Diagnosis and treatment	12
Prevention/diagnosis and treatment	3
Study design	
Cluster RCT	9
Controlled before and after study	5
Interrupted time series design	1
Uncontrolled before and after study	5
Implementation strategy *	
Single	3
Distribution of educational materials	2
Outreach visits vs. audit and feedback	1
Multifaceted	17
Distribution of educational materials	11
Educational meetings	14
Local consensus processes	3
Educational outreach visits	4
Audit and feedback	11
Reminders	5
Marketing	3
Financial intervention	1
Type of effect measured	
Process and/or structure of care	19
Patient health outcomes	9

RCT, randomised controlled trial.

*Interventions used as part of a single or multifaceted strategy were classified according to the Effective Practice and Organization of Care Group taxonomy of interventions.²³

Methodological quality

Overall, the quality of the included studies was moderate. A priori calculations of sample size were reported in seven studies^{24, 34–37, 43, 44, 47, 49–53}. In the majority of the studies that allocated study groups, practices or groups of healthcare providers were the unit of allocation^{25, 26, 30–37, 40–42, 46, 49, 50}, thereby protecting participants against contamination. In four studies, allocation was by individual provider^{24, 38, 39, 43, 44, 53}.

Five studies reported that more than 20% of providers dropped out^{24, 33, 42–44, 49, 50}. In four studies, data from less than 80% of patients were reported for at least one of the outcome measures or points in time^{31–39}. Two studies reported an agreement in (some of the) outcomes between raters of less than 90% (or $k, 0.8$)^{46, 49, 50}. In most of the studies, however, reliability of outcome measures was not reported at all^{24–32, 34–37, 40–45, 47, 48, 51–53}.

Effects on quality of care

Four studies evaluated the effectiveness of different dissemination or implementation strategies^{30, 41, 43, 44, 49, 50}, while 16 studies evaluated the effectiveness of a single implementation strategy (table 2).

Effects on process and structure of care

Of the 19 studies that examined effects of the guideline(s) on the process or structure of care, 17 showed significant improvements (table 2). The majority of these studies reported improvements with respect to some of the recommendations studied^{24–26, 28–32, 34–37, 40, 42–46, 51–53}. Only four studies showed an effect on all outcomes measuring adherence to the guideline^{27, 38, 39, 47, 49, 50}. In six studies, improvements were observed in half or less than half of the assessed process or structure of care measures^{24, 31, 32, 40, 43, 44, 46, 53}. Two studies failed to demonstrate any effect on the process or structure of care^{33, 41}.

Overall, the size of the effects varied largely across the recommendations within a guideline. Significant improvements in adherence to recommendations ranged from 7.2% to 88% in the 17 studies and varied by 76% across recommendations within one

study. In studies including a control group, odds ratios ranged from 0.2 (95% CI 0.1 to 0.6) to 27.13 (95% CI 12.86 to 57.24).

Effects on patient health outcomes

Nine studies assessed the effects of guidelines in terms of patient health outcomes. Six of these studies reported significant improvements in at least some of the outcomes studied ^{31, 32, 34–37, 43, 44, 48–52}. Wolters et al ^{43, 44} and De Laat et al ^{51, 52} reported improvements in all outcome measures, while four studies ^{31, 32, 34–37, 48–50} demonstrated modest improvements in some of the assessed patient outcome measures. In three studies ^{38–40, 47}, no effect on patient health outcomes was observed.

Table 2 - Summary of selected Dutch guideline studies addressing the effects on quality of care

First author; year	Clinical area	Study design	Intervention	Effects on process / structure of care	Effects on patient health outcomes
Engers et al., 2005 [24]	Management of low back pain	Cluster-RCT; GPs were randomly assigned (67 GPs, 616 consultations; 531 patients).	Multifaceted tailored implementation strategy (distribution of guideline, educational workshop, a tool for patient education, a tool for reaching agreement with other healthcare providers) vs. no intervention	Fewer referrals to a therapist during follow-up in IG compared to CG (36% vs. 76%; OR 0.2; 95% CI, 0.1–0.6). No sign. differences in 3 other outcome measures (e.g. prescription of pain medication on a time-contingent basis) (<i>partly effective</i>)	Not measured
Frijling et al., 2003 [25] + 2004 [26]	Preventive cardiovascular care	Controlled before and after study (617 general practices: IG: 316 / CG: 301).	Multifaceted intervention (conferences, dissemination of manuals, and support from trained non-physicians during outreach visits) vs. no intervention.	Improvement in all 8 structure-of-care-indicators in IG (varying from 12.5% for reminder for assessment of cardiovascular risk-factor profiles to 39.3% for reminder for blood pressure measurement) and in 2 out of 7 process-of-care indicators (varying from 9.7% for smoking cessation to 35.3% for measuring blood pressure) compared to CG. OR from 1.45 (95% CI, 1.02–2.07) to 27.13 (95% CI, 12.86–57.24). (<i>mostly effective</i>)	Not measured
Hak et al., 2000 [27]	Influenza and influenza vacci-nation	Uncontrolled before and after study (988 general practices).	Multifaceted intervention (employment of facilitators, information-based methods, small-group consensus meetings, individual instructions and supportive computer software).	Improvement in vaccine uptake (7.2%) and all 7 aspects of influenza immunization practice (varying from 9% for immunisation by practice assistant to 37% for sending personal reminders). (<i>mostly effective</i>)	Not measured

Table 2 - Summary of selected Dutch guideline studies addressing the effects on quality of care

First author; year	Clinical area	Study design	Intervention	Effects on process / structure of care	Effects on patient health outcomes
Hermens et al., 1999 [28] + 2001 [29]	Effective cervical cancer screening	Uncontrolled before and after study (988 general practices).	Multifaceted intervention: (educational materials, a computerised module, small group education meetings, consultations, outreach visits).	Improvement in 9 out of 10 indicators (varying from 5% for presence of a sex-age register to 33% for sending a reminder to non-compliers). (<i>mostly effective</i>)	Not measured
Hulscher et al., 1997 [30]	Organisational guidelines for cardiovascular disease prevention	Controlled before and after study (95 general practices: outreach visit: 33; feedback: 31, CG: 31).	Outreach visit method (visiting of practices by trained nurses), a feedback method (provision of feedback report with advice) vs. no intervention.	Outreach visit group improved in 6 out of 10 indicators (varying from 12% for sex-age register available to 88% for written protocols available). No improvements in feedback group. (<i>mostly effective</i>)	Not measured
Jans et al., 2000 [31] + 2001 [32]	Management of asthma and COPD	Controlled before and after study (19 practices (IG: 14/ CG: 5)/ 370 patients (IG: 280/ CG: 90).	Multifaceted intervention (identification of barriers, documentation of the care provided, specific education, feedback and peer review) vs. no intervention.	Improvement in 4 out of 8 aspects in IG (varying from 36% for monitoring of medication compliance to 74% for measurement of PEFr) compared to CG. (<i>partly effective</i>)	1 out of 4 outcomes improved in IG compared to CG (mean PEFr from 78.5 to 81.0). (<i>partly effective</i>)
Kasje et al., 2006 [33]	Treatment of chronic heart failure and diabetes mellitus type 2	Cluster-RCT, balanced in-complete block design, peer groups were randomised (16 peer groups: 10 CHF, 6 T2DM; 85 GPs; 979 patients).	Interactive educational programme for small peer groups (one arm received a programme on treatment of CHF, the other arm on hypertension treatment in DM2).	No effect on both outcome measures (prescribing of ACE inhibitors and antihypertensive treatment) in both groups compared to CG. (<i>not effective</i>)	Not measured
Lobo et al., 2002 [34] + 2004 [37] + Frijling et al., 2002 [36] + 2003 [35]	Prevention and treatment of cardiovascular care	Cluster-RCT; practices were randomised (124 practices/ 185 GPs/ 2268 patients; 537 diabetes/ 617 cardiovascular disease/ 1114 hypertension).	Multifaceted intervention (feedback reports and support from facilitators including discussion of feedback reports, selection of clinical issues for improvement, selection of methods for change and evaluation during 15 outreach visits per practice) vs. no intervention.	Improvement in all 6 aspects of organising preventive cardiovascular care, such as the nr. of preventive tasks performed by practice assistant in IG compared to CG. Improvement in process of cardiovascular care in 5 out of 12 indicators: OR from 1.55 (95% CI, 1.35-1.77) for risk factors in patients with hypertension to 4.11 (95% CI, 2.17-7.77) for checking for clinical signs of deterioration in patients with heart failure. Improvement in 2 out of 7 indicators of process of diabetes care. OR from 1.52 (95% CI, 1.07-2.16) for eye examination to 1.68 (95% CI, 1.19-2.39) for foot examination. (<i>mostly effective</i>)	Improvement in 2 out of 8 aspects of HRQL in diabetes patients compared to CG (mean change from 3.71 (95% CI: 0.73-6.68; scale 0-100) for mental health to 3.93 (95% CI, 1.08-6.78) for vitality) and in 3 out of 8 aspects in patients with cardiovascular disease (from 3.01 (95% CI, 0.72-5.30) for vitality to 3.96 (95% CI, 0.50-7.42) for social functioning). No improvement in patients with hypertension. (<i>partly effective</i>)

Table 2 - Summary of selected Dutch guideline studies addressing the effects on quality of care

First author; year	Clinical area	Study design	Intervention	Effects on process / structure of care	Effects on patient health outcomes
Renders et al., 2001 [38] + 2002 [39]	Diabetes Mellitus type II	Controlled before and after study (27 GPs (IG: 22/ CG: 5) and 389 patients (IG: 312/ CG: 77).	Multifaceted intervention (distribution of guidelines, postgraduate education, audit and feedback, templates to register diabetes care; a recall system) vs. no intervention.	Improvement in all 9 indicators (varying from 16% for measurement of BP to 44.7% for measurement of HDL cholesterol) compared to CG. OR from 2.43 (95% CI 1.01-5.82) to 12.08 (4.70 - 31.01). (<i>mostly effective</i>)	The intervention did not improve any of the 14 patient outcomes, such as blood pressure and HbA1c. (<i>not effective</i>)
Smeele et al., 1999 [40]	Treatment of asthma/ COPD	Cluster-RCT; GPs were randomised (34 GPs (IG: 17/ CG: 17) 433 patients (IG: 210/ CG:223).	Multifaceted intervention (an intensive, interactive group education and peer review programme) vs. no intervention.	Improvement in 2 structure-of-care aspects (varying from 16% for skills to 18% for presence of peak flow meters) in IG compared to CG. None of the 6 process-of care aspects showed sign. changes. (<i>partly effective</i>)	No changes in any of the 3 patient outcomes (symptoms, smoking habit, disease specific quality of life) compared to CG. (<i>not effective</i>)
Van der Weijden et al., 2005 [41]	Cholesterol for screening and management of hypercholesterolemia	Cluster-RCT; practices were randomised (32 GPs (IG: 16/ CG: 16); 20 general practices; 3950 patient records).	Multifaceted intervention (guideline dissemination, group education, supportive materials, feedback, and face-to-face instruction on location) vs. guideline dissemination.	No improvement in 2 outcome measures (quality of selective case finding and quality of diagnostic procedures) in both groups. (<i>not effective</i>)	Not measured
Van Essen et al., 1997 [42]	Influenza vaccination	Controlled before and after study (2 regions; 79 practices (IR: 82/CR: 97); 242 GPs (IR: 118/ CG: 124); 550.000 patients).	Multifaceted intervention (distribution of educational materials, educational meetings; distribution of vaccines, information on practice routines etc) vs. no intervention.	Improvement in IR on vaccine rate (21%) and 3 out of 5 organisational aspects (varying from 16% for special vaccination hours to 29% for vaccine in stock) compared to CR. (<i>mostly effective</i>)	Not measured
Wolters et al., 2005 [43] + 2006 [44]	Management of lower urinary tract symptoms	Cluster-RCT; GPs were randomised (142 GPs (IG: 70/ CG: 72); 187 patients).	A distance learning programme (evidence-based information, assessment of learning needs, knowledge test; patient education materials) vs. written guidelines.	Lower referral rate to a urologist in distance learning group (OR 0.08; 95% CI, 0.02-0.40). No effect on other 2 primary outcomes (PSA testing, prescription of medication). (<i>partly effective</i>)	No difference between groups. In both groups urinary symptoms sign. decreased. (<i>mostly effective</i>)
Kamphuis et al., 2002 [45]	Diagnosis of pulmonary embolism	Uncontrolled before and after study (117 patients before and 119 patients after)	Physicians were asked to strictly follow the diagnostic protocol after a non-high-probability perfusion-ventilation scan.	Improvement of 26% in adherence to the guideline (20% before and 46% after the implementation of the guideline). (<i>mostly effective</i>)	Not measured
Schouten et al., 2007 [46]	Antibiotic treatment of lower respiratory tract infections	Cluster-RCT; multicenter; hospitals were randomised (6 hospitals; 1906 patients).	Multifaceted intervention (feedback on baseline performance and selection of interventions on the basis of analysing barriers) vs. no intervention.	Improvement in 2 out of 5 primary outcomes in IH compared to CH (varying from 14% for antibiotic prescription; OR 2.63 (95% CI, 1.57–4.42) to 15.7% for adaptation of antibiotic dose; OR 7.32 (95% CI, 2.09–25.7). (<i>partly effective</i>)	Not reported.

Table 2 - Summary of selected Dutch guideline studies addressing the effects on quality of care

First author; year	Clinical area	Study design	Intervention	Effects on process / structure of care	Effects on patient health outcomes
Van Kasteren et al., 2005 [47]	Optimizing antibiotics policy	Interrupted time series design (13 hospitals; 1763 procedures before/ 2050 after).	Multifaceted intervention (performance feedback and implementation of national clinical practice guidelines).	Improvement in all 4 outcome measures (costs excluded) (varying from 12.4% for timing to 56% for antibiotic choice). (<i>mostly effective</i>)	No effect on overall SSI rates (<i>not effective</i>)
Bakker et al., 2006 [48]	Treatment of Diabetes Mellitus type II	Uncontrolled before and after study (70 patients).	Medical doctors were instructed to strictly adhere to the guideline.	Not measured	Improvement in 6 out of 7 outcome measures, e.g. lowering HbA1c (decrease 1.7%), and body weight (decrease 3.8 kg). (<i>mostly effective</i>)
Bekkering et al., 2005a [49] + 2005b [50]	Management of low back pain	Cluster-RCT: practices were randomised, block-randomisation (113 physiotherapists; 68 practices).	A multifaceted active strategy (dissemination of guideline and active training strategy consisting of education, discussion, role playing, feedback, reminders) vs. standard dissemination.	Improvement in all 4 outcome measures in active strategy group compared to standard dissemination group. OR from 1.99 (95% CI 1.06-3.72) for setting functional treatment goals to 3.59 (95% CI 1.35 to 9.55) for giving adequate patient information. Adherence to all four criteria also improved more in active strategy group (42% vs. 30%; OR 2.05; 95% CI 1.15 -3.65). (<i>mostly effective</i>)	No sign. difference between groups. Improvement in 2 out of 3 primary outcome variables (physical functioning from 38-20 (scale 0-100) in active strategy group and from 40.5-17.5 in standard group and pain from 7.0-2.0 (scale 0-10) in both groups) in first 12 weeks. (<i>mostly effective</i>)
De Laat et al., 2006 [51] + 2007 [52]	Prevention and treatment of pressure ulcers	Uncontrolled before and after study (process of care: T0: 657; T1: 735; T2: 755 patients and patient outcomes: 399 patients).	Guideline was introduced in staff meeting, announcement in several hospital media and the introduction of pressure reducing viscoelastic foam mattresses.	Improvement in inadequate prevention (from 19 to 4% after 4 months and to 6% after 11 months) and in inadequate treatment (from 60 to 31%). (<i>mostly effective</i>)	Improvement in both patient outcome measures (incidence of pressure ulcers decreased from 54 to 32 per 1000 patient days; pressure ulcer free time increased from 12-19 days). (<i>mostly effective</i>)
Van der Sanden et al., 2005 [53]	Management of asymptomatic impacted lower third molars	Cluster-RCT; GDPs were randomised (92 GDPs: I: 46/ C: 46).	A multifaceted intervention (i.e. feedback, reminders, and an interactive meeting) vs. no intervention.	Increased knowledge of dentists in IG compared to CG. No improvement in other outcome measure (referral rates). (<i>partly effective</i>)	Not measured

GP = general practitioner; GDP = general dental practitioner; RCT = randomised controlled trial; IG = intervention group; CG = control group; IR = intervention region; CR = control region; IH = intervention hospital; CH = control hospital; OR = odds ratio; CI = confidence interval; sign.= significant. NSAIDs = nonsteroidal anti-inflammatory drugs; COPD = chronic obstructive pulmonary disease; PEFR = peak expiratory flow rate; CHF = chronic heart failure; DM2 = diabetes mellitus type 2; ACE inhibitors = inhibitors of angiotensin-converting enzyme; HRQL = health related quality of life; BP = blood pressure; HDL cholesterol = 'high density' lipoprotein cholesterol; PSA test = prostate-specific antigen test; SSI = surgical site infections. Mostly effective, significant effect on more than half of the outcome measures was reported not effective = no significant effect on any of the outcome measures was reported; partly effective = significant effect on half or less than half of the outcome measures was reported; mostly effective = significant effect on more than half of the outcome measures was reported

Characteristics of the studies and effects on quality of care

All studies focusing on preventive care were mostly effective in terms of the process or structure of care (table 3)^{25–30, 42}. With respect to type of design, all uncontrolled before and after studies that measured effects on process or structure of care^{27–29, 45, 51, 52} or on patient health outcomes^{48, 51, 52} were categorised as mostly effective. In contrast, both studies that failed to demonstrate an effect on clinical practice were cluster randomised controlled trials^{33, 41}.

There were no differences in effects on quality of care with respect to type of healthcare provider, type of guideline or between studies that used multifaceted intervention strategies and studies that used a single intervention.

Table 3 – Characteristics of included studies (N=20) and effects on quality of care

	Process / structure of care			Patient outcomes		
	Not effective	Partly effective	Mostly effective	Not effective	Partly effective	Mostly effective
<i>Type of healthcare provider</i>						
General practitioners	2	4	7	2	2	1
Medical specialists	0	1	2	1	0	0
Other healthcare providers	0	1	2	0	0	3
<i>Type of guideline</i>						
National	1	4	9	3	2	3
Regional / local	1	2	2	0	0	1
<i>Subject of study</i>						
Preventive care	0	0	5	0	0	0
Diagnosis & treatment	1	6	4	3	1	3
Prevention / diagnosis & treatment	1	0	2	0	1	1
<i>Study design</i>						
Cluster-RCT	2	5	2	1	1	2
Controlled before and after study	0	1	4	1	1	0
Interrupted time series design	0	0	1	1	0	0
Uncontrolled before and after study	0	0	4	0	0	2
<i>Implementation strategy</i>						
Single	0	0	2	0	0	1
Multifaceted	2	6	9	3	2	3

RCT, randomized controlled trial.

Mostly effective, significant effect on more than half of the outcome measures was reported; not effective, no significant effect on any of the outcome measures was reported; partly effective, significant effect on half or less than half of the outcomes measures was reported.

Discussion

Overall, the results of this study demonstrate that there is evidence for the effectiveness of Dutch evidence-based guidelines on the process and structure of care in The Netherlands. The majority of the studies reported improvement with respect to some of the recommendations studied. In addition, the size of the effects varied largely across recommendations within the guidelines. The effects of guidelines on patient health outcomes were studied far less and data are less convincing. Two-thirds of the studies that measured patient outcomes reported significant improvements. However, the observed changes in patient outcomes were generally modest and only found for some of the outcomes studied.

Findings from our review in terms of the process of care are comparable with those of previous international reviews which demonstrated small to moderate improvements³⁻⁵. With respect to patient outcomes, results from earlier reviews were inconsistent^{3, 6}. However, measuring patient outcomes is complex due to many factors such as long delays and confounding of many outcomes^{54, 55}. Our review provides some evidence for the effects of guidelines on patient outcomes. It also suggests that guidelines focusing on preventive care are particularly effective in improving the process or structure of care. Nevertheless, the number of studies in our review does not allow us to draw firm conclusions on the effects of guidelines on patient outcomes or on factors that contribute to improved quality of care.

An important finding of our study is that the observed effects varied largely across recommendations. The variation could be explained by barriers related to individual recommendations rather than barriers that apply to the guideline as a whole. For example, although we selected only evidence-based guidelines in our study, the strength of the evidence may vary across recommendations, thereby influencing their impact^{8, 9}. Also, a recommendation may not be performed because of other factors such as healthcare professional issues (eg, lack of motivation) or environmental factors (eg, lack of resources). Future research should focus on barriers related to both the

guideline and its specific recommendations when exploring the association with effects on quality of care.

Furthermore, the fact that the effects of guidelines varied largely across recommendations might suggest that guideline implementation should focus more on individual recommendations rather than the guideline as a whole. Whereas the majority of studies included in our review used multifaceted strategies to implement the guideline, these were generally not tailored to individual recommendations. The nature of the implementation strategy is often the same for all recommendations within a guideline. A more focused approach, based on the results of an analysis of barriers of adhering to individual recommendations could improve the use and effectiveness of guidelines in practice.

One of the strengths of the present study is that it focuses on the effectiveness of evidence-based guidelines on quality of care. Previous reviews also considered guidelines that were not developed according to the standards of evidence-based medicine. In addition, in our study the effects of guidelines within one healthcare system were analysed. The guidelines in the studies included in this review were produced by well-known and credible organisations in The Netherlands and these guidelines generally have acceptable quality scores and are adequate tools for healthcare improvement ^{56, 57}.

As stated before, The Netherlands has been a forerunner in evidence-based guideline development and implementation research in Europe. Based on the current literature, we have no reason to believe that the effectiveness of evidence-based guidelines, in terms of quality of care, is different in other countries or that more robust designs are generally used to assess these effects. Contextual and country-specific factors may, however, influence the effectiveness of evidence-based guidelines in terms of quality of care. In some countries, such as Scotland and New Zealand, guidelines are produced in a similar context as in The Netherlands, making the conclusions applicable to these countries as well ².

Several limitations to the present study can be mentioned. First, despite the long tradition of evidence-based guideline development in The Netherlands, the number of studies measuring the effects of guidelines with a robust design was limited. Therefore, we decided to include uncontrolled before and after studies as well, while taking into account the weaknesses of these designs. However, our results demonstrate that these studies tended to have more positive results than studies using more robust designs. Because of the relatively small number of uncontrolled before and after studies in our review, our conclusions regarding the effectiveness of guidelines were not much affected by it. Nevertheless, this finding highlights the need for well-designed studies measuring the effectiveness of Dutch evidence-based guidelines.

Second, the studies included in our review were very heterogeneous, not allowing pooling of the results. On the other hand, heterogeneity of studies may increase the generalisability of findings as a wider range of different settings, study populations and behaviours are included⁵⁸. Third, to determine effectiveness of guidelines on quality of care, we counted the number of measures in each study that showed a significant result. In this assessment, we did not take into account the effect sizes of the individual measures (equal weights are given to improvements of 1 or 70%)⁵⁸. As an alternative, we categorised the effectiveness of an intervention in mostly, partly and not effective, which may provide more insight than a dichotomy.

In conclusion, there is a huge imbalance between the number of guidelines developed and the number of high-quality studies that assess their effectiveness. Despite this, our review demonstrates that Dutch evidence-based guidelines can be effective in improving the process and structure of care. Evidence on the effectiveness of guidelines on patient outcomes is less convincing. The variation in effects across recommendations suggests that it is useful to focus on recommendations when analysing barriers to guideline adherence and to design implementation strategies tailored to individual recommendations instead of to the guideline as a whole. Further research is needed to determine which factors linked to the guideline and its specific recommendations are important in predicting guideline utilisation and improved patient outcomes.

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Appendix 1: Search strategy

1. Search: Medline (1990-2007)

- | No. | Request |
|-----|---|
| 1 | 1990 in py |
| 2 | 20070504 in ud |
| 3 | (dutch near5 guideline?) in ti,ab |
| 4 | (netherlan* near5 guideline?) in ti,ab |
| 5 | GUIDELINE- in PT |
| 6 | (GUIDELINE- in PT) and ((dutch or netherlands*) in ti,ab) |
| 7 | #3 or #4 or #6 |
| 8 | (implement* or adherenc* or compliance) in ti,ab |
| 9 | "Health-Plan-Implementation"/ all subheadings |
| 10 | #7 and (#8 or #9) |
| 11 | (quality near (care or health)) in ti,ab |
| 12 | "Outcome-and-Process-Assessment-Health-Care"/ all subheadings |
| 13 | explode "Outcome-Assessment-Health-Care"/ all subheadings |
| 14 | #12 or #13 |
| 15 | Nederlands-tijdschrift-voor-geneeskunde in jn |
| 16 | (Nederlands-tijdschrift-voor-geneeskunde in jn) and (GUIDELINE- in PT) |
| 17 | "Quality-of-Health-Care"/ all subheadings |
| 18 | ((patient? near outcome?) or (health near benefit?)) in ti,ab |
| 19 | ((Nederlands-tijdschrift-voor-geneeskunde in jn) or (netherlands in mesh)) and (GUIDELINE- in PT) |
| *20 | (#7 or #19) and (#8 or #9) and (#11 or #14 or #17 or #18) |

2. Search: Medline (1990-2007)

- | No. | Request |
|-----|---|
| 1 | 1990 in py |
| 2 | 20070504 in ud |
| 3 | Nederlands-tijdschrift-voor-geneeskunde in jn |
| 4 | netherlands in ad |
| 5 | "Practice-Guideline" in MIME,MJME,PT |
| 6 | #4 and #5 |
| 7 | (dutch or netherlands) in ti,ab |
| 8 | ((implement* or adher* or adher* or complian* or non?adhere* or non?complian* or availab*) in ti,ab) near guideline?) in ti,ab |
| 9 | "Practice-Guideline" in MIME,MJME,PT |
| *10 | ((implement* or adher* or adher* or complian* or non?adhere* or non?complian* or availab*) in ti,ab) and #9 and (#3 or #4 or #7) |
| 11 | #8 and (#3 or #4 or #7) |
| *12 | (#8 in ti) and (#3 or #4 or #7) |
| 13 | "Health-Plan-Implementation"/ all subheadings |
| 14 | "Health-Knowledge-Attitudes-Practice" in MIME,MJME,PT |
| 15 | "Quality-of-Health-Care"/ all subheadings |
| 16 | ((patient? near outcome?) or (health near benefit?)) in ti,ab |
| 17 | ((local near recurren*) or (overall near5 survival) or survival or positive or uniformity or (quality near5 care) or (life near5 expectanc*) or mortality or efficacy or effecti*) in ti,ab |
| *18 | #8 and (#3 or #4 or #7) and (#13 or #14 or #15 or #16 or #17) |

Search: Embase (1990-2007)

No. Request

- 1 1990 in py
- 2 20070504 in ud
- 3 (dutch near5 guideline?) in ti,ab
- 4 (netherlan* near5 guideline?) in ti,ab
- 5 "practice-guideline"/ all subheadings
- 6 "practice-guideline"/ all subheadings and ((dutch or netherland*) in ti,ab)
- 7 (implement* or adherenc* or compliance) in ti,ab
- 8 explode "treatment-outcome"/ all subheadings
- 9 "outcome-assessment"/ all subheadings
- 10 "total-quality-management"/ all subheadings
- 11 explode "quality-of-life"/ all subheadings
- 12 "health-care-quality"/ all subheadings
- 13 #8 or #9 or #10 or #11 or #12
- 14 (#3 or #4 or #6) and #7 and (#13 or (((patient? near outcome?) or (health near benefit?)) in ti,ab))
- *15 (#3 or #4) and #7 and (#13 or (((patient? near outcome?) or (health near benefit?)) in ti,ab))

A person wearing a patterned dress and white high-heeled shoes is walking on a paved path. They are carrying a black bag filled with various medicine boxes, including brands like 'Diplofalon' and 'Josacilin 50'. The scene is captured from a low angle, focusing on the person's legs and the bag.

Chapter 3

Why don't physicians adhere to guideline recommendations in practice? An analysis of barriers among Dutch general practitioners

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Implementation Science 2009, 4:54

Abstract

Background: Despite wide distribution and promotion of clinical practice guidelines, adherence among Dutch general practitioners (GPs) is not optimal. To improve adherence to guidelines, an analysis of barriers to implementation is advocated. Because different recommendations within a guideline can have different barriers, in this study we focus on key recommendations rather than guidelines as a whole, and explore the barriers to implementation perceived by Dutch GPs.

Methods: A qualitative study using six focus groups was conducted, in which 30 GPs participated, with an average of seven per session. Fifty-six key recommendations were derived from twelve national guidelines. In each focus group, barriers to the implementation of the key recommendations of two clinical practice guidelines were discussed. Focus group discussions were audiotaped and transcribed verbatim. Data was analysed by using an existing framework of barriers.

Results: The barriers varied largely within guidelines, with each key recommendation having a unique pattern of barriers. The most perceived barriers were lack of agreement with the recommendations due to lack of applicability or lack of evidence (68% of key recommendations), environmental factors such as organisational constraints (52%), lack of knowledge regarding the guideline recommendations (46%), and guideline factors such as unclear or ambiguous guideline recommendations (43%).

Conclusion: Our study findings suggest a broad range of barriers. As the barriers largely differ within guidelines, tailored and barrier-driven implementation strategies focusing on key recommendations are needed to improve adherence in practice. In addition, guidelines should be more transparent concerning the underlying evidence and applicability, and further efforts are needed to address complex issues such as comorbidity in guidelines. Finally, it might be useful to include focus groups in continuing medical education as an innovative medium for guideline education and implementation.

Background

Clinical practice guidelines are commonly regarded as useful tools for quality improvement ¹. However, their impact on clinical practice is not optimal. Several reviews have shown that guidelines have only been moderately effective in changing the process of care, and that there is much room for improvement ²⁻⁶. For instance, general practitioners (GPs) in the Netherlands do not prescribe drugs according to the national guidelines in about one-third of cases, and this figure has stayed fairly constant during the last few years ^{7, 8}. In addition, levels of adherence vary largely between practices and between diagnoses ⁷⁻⁹.

To improve adherence to guidelines in practice, an analysis of barriers to implementation of guidelines among target users is advocated ^{10, 11}. A large number of potential barriers have been identified operating at different levels, such as the level of the practitioner, the level of the patient, the organisational context, and the social and cultural context ¹⁰⁻¹⁴. A recently conducted review and synthesis of qualitative studies ¹⁵ identified six themes of barriers to the implementation of guidelines among GPs: the content of the guidelines, the format of the guidelines, GPs individual experience, preserving the doctor-patient relationship, professional responsibility, and practical issues.

Few studies have focused on a set of guidelines considering the variety of barriers that should be addressed to improve guideline adherence ¹². In addition, guideline studies often focus on barriers regarding the guideline as a whole, rather than on barriers operating at the level of the individual recommendations within the guidelines ¹⁶⁻¹⁹. As different recommendations within the same guideline can have different barriers, it might be more useful to focus on barriers of individual recommendations to optimize the strategies needed for implementation of guidelines in practice.

The aim of this study was to identify the perceived barriers towards the use of national guidelines for general practice by focusing on the key recommendations within the guidelines. By analysing multiple key recommendations from a set of guidelines, we

aim to identify which barriers occur most frequently across the selection. These findings may be useful for guideline developers as well as for professional organisations in designing tailored implementation strategies.

Methods

Setting

The Dutch College of General Practitioners (NHG) has developed a set of more than 80 national guidelines that cover the majority of conditions and diseases seen in general practice ²⁰. The guidelines have been developed according to the principles of evidence-based medicine, formulating recommendations based on the best available evidence ²¹. Along with the development of guidelines, NHG also puts considerable effort into promoting the use of these guidelines among the target group. They select key recommendations within each guideline, provide a two-page summary, and supply tools for application, such as electronic decision tools, patient information leaflets, and educational materials. In addition, continuing medical education (CME) for GPs in the Netherlands is only accredited if it is based on this set of nationally endorsed guidelines.

Study design

Six two-hour focus group sessions were conducted in which twelve NHG guidelines were discussed. Focus groups have proven to be a useful method of providing in-depth information and exploring cognitions and motivations underlying behaviour ²²⁻²⁵. This is particularly useful when behaviour change is needed. The focus groups enabled us to identify the most relevant barriers perceived by GPs in applying guidelines in practice.

Selection of clinical guidelines

An expert panel of GPs (n=16) was asked to help selecting the guidelines for our study. The panel was recruited by the organisation responsible for CME for GPs in the Southwestern part of the Netherlands (Stichting KOEL) ²⁶. We provided an overview of the NHG guidelines published since 2003 and asked the panel members for each guideline about the relevance of studying the effects of the guideline on quality of care

and the potential improvement of quality of care as a result of implementing the guideline. In addition, they were asked to select five guidelines that should have high priority as part of a guideline implementation study.

The panel suggested nineteen guidelines having high priority. From these nineteen, we selected twelve guidelines according to the equal distribution among prevalence and type of diseases, and the measurability of quality improvement on patient outcomes (Table 1). Fifty-six key recommendations were abstracted from the twelve guidelines (Additional File, in Dutch).

Table 1 – Selected guidelines

Guideline	Number of key recommendations	Year of publication
Asthma among children	7	2006
Atrial fibrillation	5	2003
Cardiovascular risk management	7	2006
Cerebrovascular accident	5	2004
Depressive disorder	5	2003
Eye inflammation ('red eye')	3	2006
Rhinosinusitis	2	2005
Sexually transmitted diseases	4	2004
Sleeping disorder	7	2005
Thyroid disorders	3	2006
Transient ischemic attack	3	2004
Urinary tract infections	5	2005

Selection of participants

GPs were recruited by Stichting KOEL through advertisement in their electronic newsletter and website. They could register for more than one focus group session and were offered CME accreditation (two hours per session). All 34 GPs that had registered for one or more focus group sessions were invited and 30 of them (88%) participated in the sessions (range, 5 to 13). Nine of them participated in two sessions and one in all six sessions. One-half of the participants were male, and most of them were between 45 and 54 years of age (37%), practiced in a group setting (45%), and worked in a rural area or small town (39%). Compared to the total population of Dutch GPs ²⁷, participants working in group practices and in towns or small cities were slightly overrepresented.

Focus groups sessions

The participants received a copy of the key recommendations of the guidelines one week in advance. In each focus group session, the GPs had a semi-structured discussion about the perceived barriers to the implementation of the key recommendations of two guidelines. The sessions were chaired by a GP with at least 15 years of experience in general practice and guideline development (JB), and co-chaired by a health services researcher (ML). A topic guide with open-ended questions was used to structure the discussion. The six sessions were held at Stichting KOEL from March to June 2008 and were audiotaped.

Data analysis and synthesis

The focus groups were transcribed verbatim. Two researchers (ML and JZ) independently studied the transcripts and classified the comments according to the framework of Cabana et al.¹². In this framework, three main categories of barriers to following guidelines are distinguished: barriers related to knowledge, barriers related to attitude, and external barriers that are subdivided into several subcategories. For those comments that did not fit into the categories of the framework, additional types of barriers were formulated (Table 2).

Additionally, we further divided organisational constraints into organisational constraints within the own organisation or practice (such as opening hours or insufficient number of personnel/staff), organisational constraints outside the organisation (such as policies in hospitals or out of hours services), and organisational constraints between organisations (such as communication and collaboration with other healthcare providers). Results of the two researchers were compared and discrepancies were discussed until consensus was reached. When necessary, a third researcher (JB or GW) was consulted.

In the synthesis of the data, the key recommendation is the unit of analysis. For each barrier in our model, we calculated the number and percentage of key recommendations to which the barrier applied.

Table 2 – Perceived barriers* to the implementation of key recommendations from selected guidelines

Perceived barriers	Key recommendations (N = 56)		Clinical guidelines (N = 12)	
	N	%	N	%
Knowledge	26	46	10	83
Lack of knowledge	26	46	10	83
Lack of awareness/ familiarity	26	46	10	83
Attitude	51	91	12	100
Lack of agreement with guideline recommendation	38	68	12	100
Interpretation/ lack of evidence**	13	23	9	75
Lack of applicability	32	57	12	100
Lack of self-efficacy	11	20	8	67
Lack of outcome expectancy	17	30	10	83
Inertia of previous practice/ lack of motivation	15	27	8	67
Behaviour	46	82	12	100
Patient factors	22	40	11	92
Patients preferences/ demands	14	25	9	75
Patients ability/ behaviour**	11	20	8	67
Guideline recommendation factors	24	43	11	92
Unclear/ ambiguous**	18	32	11	92
Incomplete/ not up to date**	8	14	4	33
Not easy to use/ too complex**	3	5	3	25
Environmental factors	29	52	12	100
Lack of time/time pressure	7	13	5	42
Lack of resources/ materials	7	13	5	42
Organisational constraints	20	36	11	92
Lack of reimbursement	2	4	2	17

* Barriers were classified according to the framework of Cabana *et al.* (1999) with some additional types of sub-barriers (**)

Results

Perceived barriers

Barriers related to attitude were perceived for 91% of the key recommendations; behaviour-related barriers and knowledge-related barriers were perceived for 82% and 46% of the key recommendations respectively (Table 2).

Within these three main categories, the most perceived barriers were lack of agreement with guideline recommendations (applicable to 68% of the key recommendations), followed by environmental factors (52%), lack of knowledge of the guideline recommendations (46%), and guideline recommendation factors (43%). Table 3 presents the perceived types of barriers per guideline. In the following sections, the

perceived barriers are discussed according to the main categories of barriers: knowledge, attitude and behaviour.

Barriers related to knowledge

Lack of awareness/familiarity

GPs were generally aware of the guidelines, but did not know the specific content of 46% of the key recommendations (Table 2). GPs were mostly familiar with part of the key recommendation, but did not know, for instance, the recommended dosage of the drug (Appendix 1). Lack of awareness or familiarity was most relevant for the guidelines regarding transient ischemic attack and sexually transmitted diseases (Table 3).

Barriers related to attitude

Lack of agreement with guideline recommendation

The most reported attitudinal barrier was a lack of agreement with the guideline recommendation (68%). This barrier was mostly related to a lack of applicability (57%) (Table 2). GPs felt that benefits often did not outweigh the harms, or that a recommendation was not applicable to a specific group of patients, such as patients with comorbidity (Appendix 2). Another reason why GPs did not agree with the recommendation was that they argued the evidence (or lack of evidence) underlying a recommendation (23%) (Appendix 2). Lack of agreement with guideline recommendations was a problem for all key recommendations in the guidelines for rhinosinusitis, thyroid disorders, transient ischemic attack, and urinary tract infection (Table 3).

Lack of self-efficacy

The lack of belief that one is capable of adequately performing the recommendation in practice was a barrier in 20% of the key recommendations. Reasons mentioned were a lack of skills, experience or training, or having more confidence in the expertise of other healthcare providers (Appendix 2). This type of barrier was most often

mentioned for the key recommendations in the guidelines for thyroid disorders, and sexually transmitted diseases (Table 3).

Lack of outcome expectancy

In 30% of the key recommendations, GPs agreed with the content, but did not believe that applying the recommendation would result in better patient outcomes (Appendix 2). This was particularly a problem for the guidelines regarding rhinosinusitis, asthma among children, and sleeping disorder (Table 3).

Inertia of previous practice/lack of motivation

In 27% of the key recommendations, GPs were not sufficiently motivated to change, or felt that it was hard to overcome the inertia of previous practice due to habits and routines (Appendix 2). These barriers were most frequently mentioned for the guidelines regarding eye inflammation and cardiovascular risk management (Table 3).

Barriers related to behaviour

Patient factors

Patient factors were mentioned as a barrier with respect to 40% of the key recommendations. In 25% of cases, GPs felt that patients' preferences did not match with the guideline recommendation (Table 2). Patient ability or behaviour was perceived as a barrier for 20% of the key recommendations, e.g., patients were not able to perform a required action accurately, or did not show up for follow-up (Appendix 3). Patient factors were most often reported as a barrier for the guidelines regarding rhinosinusitis, eye inflammation, and thyroid disorder (Table 3).

Guideline recommendation factors

In 43% of the key recommendations, factors related to the guideline were perceived as a barrier to implementation (Table 2). Recommendations were found to be unclear or confusing (32%), not covering all relevant information, or not being up to date (14%), or too complex or not easy to use in practice (5%) (Appendix 4). These types of

barriers were most prominent for the guidelines regarding sexually transmitted diseases, cerebrovascular accident, and asthma among children (Table 3).

Table 3 – Perceived barriers to the implementation of key recommendations per guideline

Clinical practice guideline (Number of key recommendations)	Knowledge		Attitude			Behaviour		
	Lack of awareness/familiarity	Lack of agreement	Lack of self-efficacy	Lack of outcome expectancy	Inertia previous practice/lack of motivation	Patient factors	Guide-line factors	Envi-ron-mental factors
Asthma among children (7)	+	++	--	+	--	-	+	-
Atrial fibrillation (5)	--	+	--	--	-	--	+	++
Cardiovascular risk management (7)	--	-	--	--	+	-	-	-
Cerebrovascular accident (5)	+	++	-	-	--	--	++	--
Depressive disorder (5)	--	+	--	--	--	-	--	--
Eye inflammation (3)	-	+	-	-	+	+	--	++
Rhinosinusitis (2)	--	++	--	++	--	++	+	+
Sexually transmitted diseases (4)	++	+	+	-	+	+	++	+
Sleeping disorder (7)	+	-	--	-	--	-	--	-
Thyroid disorder (3)	+	++	+	--	--	+	-	++
Transient ischemic attack (3)	++	++	-	-	-	-	-	-
Urinary tract infections (5)	+	++	--	-	-	--	-	++
Mean 12 guidelines (4.7)	-	+	--	-	-	-	-	+

-- barrier applicable to 0 to 25% of the key recommendations
- barrier applicable to 25 to 50% of the key recommendations
+ barrier applicable to 50 to 75% of the key recommendations
++ barrier applicable to 75 to 100% of the key recommendations

Environmental factors

Environmental factors were the most prominent barrier related to behaviour (52%) (Table 2). Particularly, organisational constraints were often reported as a barrier (36%). These constraints mostly referred to organisational constraints outside the organisation, such as logistic problems in out of hours services. Perceived constraints within the practice included communication and lack of education or skills among practice assistants. Constraints between organisations were unclear division of tasks

and lack of collaboration with specialists in hospitals (Appendix 5). Other environmental barriers were lack of time (13%) and lack of resources (13%) (Appendix 5). Environmental barriers were relatively often perceived for the guidelines concerning eye inflammation, thyroid disorders, atrial fibrillation, and urinary tract infection (Table 3).

Discussion

Our study revealed a broad spectrum of barriers that Dutch GPs perceive in applying the key recommendations of a set of nationally developed guidelines. Although the focus of the barriers differed across guidelines, each key recommendation had a unique combination of barriers. As a consequence, multiple interventions tailored to the specific barriers of the key recommendations are needed to improve the implementation of guidelines in practice.

The most prominent barrier was lack of agreement with guideline recommendations. GPs often disagreed with recommendations because they argued the underlying evidence provided or felt that it was not clear why they should apply them. In addition, they perceived some recommendations not being applicable due to heterogeneity of patient populations. Other studies also demonstrated that lack of applicability is an important barrier to guideline adherence, particularly to patients with comorbidity^{18, 28, 29}. Evidence-based guidelines focus on patients with single diseases and often exclude complex patients, which limits the applicability in practice³⁰⁻³³. Further research and efforts are needed on methods to address comorbidity in guidelines in order to improve the applicability of guideline recommendations^{31, 32, 34}.

Environmental barriers, particularly organisational constraints, were the second most often perceived group of barriers to implementation. These constraints mostly referred to logistic problems within the own practice or within out of hours healthcare services. Moreover, lack of collaboration with other types of healthcare professionals was perceived as a barrier in our study, which is consistent with other studies^{17, 35-38}. Improvements can be made by better organising care and by improving

multiprofessional collaboration. Standardisation of processes and procedures, and interprofessional agreements on referral and follow-up might be useful.

Dutch GPs are generally aware of the guidelines because they are a fundamental part of the postgraduate training and continuing medical education. This is a strong feature of the professionalisation of GPs that is rooted in the 1980s when the guideline program of the NHG started. Nevertheless, GPs did not know the content well for almost half of the key recommendations in the guidelines selected in our study. GPs might be confronted with too many guidelines, as each year eight to ten new guidelines or updated versions are produced. To improve knowledge on guidelines, it may be useful to regularly conduct sessions among GPs, because the participants in our study appreciated the focus group sessions and considered these as an innovative medium for guideline education and implementation. The effectiveness of interactive education with active involvement and participation has been demonstrated in other studies as well ³⁹⁻⁴¹.

In our study, we found that guideline factors were a relevant barrier to implementation, which is consistent with previous studies ^{12, 42}. GPs prefer short guideline recommendations that are easy to understand. The challenge is to produce simple and clear guideline recommendations that also address the complexity of problems seen in daily practice. Presenting guideline recommendations in multiple formats, such as algorithms, one or two page summaries, and electronic web-based versions with hyperlinks to more detailed information might serve the varying needs of physicians and patients ^{42, 43}.

We used an existing framework of barriers to guideline adherence from Cabana et al. ¹², and explored whether it covered the full range of barriers perceived by GPs in our study. We suggest that lack of applicability should be a more prominent category, including different reasons such as that the benefits may not outweigh the harms or patients with comorbidity who need special attention. In addition, the external barriers could be extended with some subcategories, as presented in Table 2. Finally, organisational constraints could be subdivided into organisational constraints within

the own organisation or practice, those outside the organisation and those between organisations. Other studies also suggested additions to the framework^{44, 45}.

One of the strengths of our study is that we examined a large set of guidelines produced within one longstanding guideline program. Most qualitative studies have focused on a specific health topic, or studied only one or two guidelines^{18, 19, 42, 46, 47}, limiting the applicability of their findings. Secondly, we focused on barriers to key recommendations, rather than on barriers to guidelines as a whole. Our in-depth analysis of barriers provides detailed information on potential interventions needed to improve guideline adherence. This information can be used by professional groups or organisations, regionally and nationally, to develop multifaceted interventions, tailored to the individual recommendations in the guideline. For example, to improve the implementation of the guideline on urinary tract infections, it was suggested to develop local protocols for diagnosis in out of hours services, as the recommendation on diagnosis (i.e., the use of a dipslide method) did not apply well in these settings. Finally, the findings from our study may be useful for guideline developers in the process of updating the guidelines to raise the acceptance and implementability of the guideline recommendations.

Several limitations should be considered in interpreting our findings. First, we collected opinions from a small sample of GPs, with GPs working in group practices and in towns and small cities being slightly overrepresented²⁷. However, the aim of our focus group study was to identify possible barriers qualitatively, rather than quantifying their relative importance among a representative group of GPs. Results from this study will be used as input for a survey to be conducted among a larger sample of GPs in order to quantify our findings. Secondly, we only included GPs and no other healthcare professionals in our focus group sessions. As some of the barriers were related to behaviour of the practice assistants or practice nurses, it might be useful to include these professions in focus group sessions as well.

Conclusion

In conclusion, we identified a wide range of barriers that Dutch GPs face when using national guidelines. Using the focus group method proved to be an effective method to collect information on barriers. Results from this study help explaining why GPs do not adhere to guideline recommendations in practice, and provide useful suggestions for improving adherence. Our study also illustrated that lack of adherence to individual recommendations is related to multiple barriers. A detailed, in-depth analysis of barriers, as conducted in this study, offers opportunities for professional organisations to develop multiple, barrier driven, and tailored interventions to improve adherence in practice.

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Appendix 1 - 5: Examples of perceived barriers

Appendix 1: Examples of perceived barriers related to knowledge

LACK OF AWARENESS/FAMILIARITY

Guideline Sleeping disorder

'Can I be really honest with you? I have never read the guideline, never looked at it, never...'

Guideline Cerebrovascular accident (KR 2)

'I did not know about 160 mg acetylsalicylic acid for the course of two weeks... I always start with 80 mg in patients with stroke.'

Appendix 2: Examples of perceived barriers related to attitude

LACK OF APPLICABILITY – benefits do not outweigh the harms

Guideline urinary tract infection (KR 4)

'I usually prescribe ciprofloxacin for the course of 10 days, because Augmentin is badly tolerated according to my experience.'

LACK OF APPLICABILITY – not applicable to patient population

Guideline depressive disorder (KR1)

'In practice, you never see patients with depression only or anxiety disorder only. Both often overlap. Then, the management plan is unclear.'

INTERPRETATION/LACK OF EVIDENCE – lack of evidence

Guideline atrial fibrillation (KR3)

'I only do thyroid gland testing. I do not understand the need for testing Hemoglobin and glucose in patients with atrial fibrillation. What's the evidence?'

LACK OF SELF-EFFICACY

Guideline thyroid disorders (KR 2)

'I do not have experience in treating hyperthyroid patients and only see a few of them per year. I think this is not sufficient to build up expertise.'

LACK OF OUTCOME EXPECTANCY

Guideline sleeping disorder (KR 6)

'.. as GP in training, I was motivated to stop long term use of hypnotics in patients with a sleeping disorder. But now, people tell me: don't do it, it demands a lot of energy, without any predicted result. Then you start thinking: hands off, leave it.'

INERTIA OF PREVIOUS PRACTICE

Guideline cardiovascular risk management (KR 4)

'The new guideline recommends using systolic blood pressure...in monitoring drug treatment in patients with hypertension. However, I am used to monitor diastolic blood pressure...and then I feel guilty if I see someone with 150...I think that's a big change.'

Appendix 3: Examples of perceived barriers related to behaviour: patient factors

PATIENT FACTORS – Patient preferences and demands

Guideline rhinosinusitis (KR2)

'There is a tension between the recommendation and patient demands. Patients expect antibiotics. This sometimes causes friction...yes.'

PATIENT FACTORS – Patient ability and behaviour

Guideline asthma among children (KR2)

'Some children perform well in spirometry, but with a very large number the results are totally invalid. Well, with some children it is just not going to work.'

Guideline cardiovascular risk management (KR 7)

'Yes, I try to, but there are always patients that do not show up for follow-up. Always. Also with medication.'

Appendix 4: Examples of perceived barriers related to behaviour: guideline recommendation factors

GUIDELINE RECOMMENDATION FACTORS – Confusing/not clear

Guideline asthma among children (KR1)

'I read the recommendation [on allergy testing in children younger than six years] five times, and I still did not understand it!'

GUIDELINE RECOMMENDATION FACTORS – Incomplete/not up to date

Guideline cerebrovascular accident (KR1)

'This recommendation is based on obsolete opinions. You cannot keep patients with stroke at home. All of them should be immediately admitted to hospital.'

Appendix 5: Examples of perceived barriers related to behaviour: environmental factors

ENVIRONMENTAL FACTORS – Organisational constraints (outside organisation)

Guideline urinary tract infection (KR1)

'How to use a dipslide in out of hours services on Sunday? Then you need someone who reads the results on Monday. That is really bothersome.'

ENVIRONMENTAL FACTORS – Organisational constraints (within own practice)

Guideline eye inflammation (KR2)

'I would like to reduce antibiotic prescriptions in patients with red eye, but the practice assistant often deals with these patients who ask for a prescription by telephone. The bottleneck is mainly in prescriptions requested over the telephone. There is an important improvement to make there, yes! As the assistant thinks that at any time a prescription is necessary.'

ENVIRONMENTAL FACTORS – Organisational constraints (between organisations)

Guideline cerebrovascular accident (KR 4/5)

'It is unclear what the hospital arranges and what we need to do when stroke patients return to their homes. There should be a formal handoff between hospital and the GP.'

ENVIRONMENTAL FACTORS – Lack of time/time pressure

Guideline cardiovascular risk management (KR 1/2)

'It's great what we could offer in cardiovascular risk management, but it would need full weekdays to realize this in practice.'

ENVIRONMENTAL FACTORS – Lack of/unpractical resources/materials

Guideline sexually transmitted diseases (KR3)

'There are different media, which is unpractical in use...and the media used in cervix streams can only be shortly preserved.'

Additional File: Key recommendations of guidelines (Dutch)

1. Asthma among children/ Astma bij kinderen (M24; 2006)

Kernaanbeveling 1:

Bij kinderen tot 6 jaar met aanwijzingen voor allergie of een allergische rhinitis en bij alle kinderen vanaf 6 jaar met klinische aanwijzingen voor astma (recidiverend optreden van kortademigheid of astma, al dan niet na inspanning) wordt aanbevolen screenend allergologisch onderzoek d.m.v. RAST-test op inhalatie-allergenen te verrichten.

Kernaanbeveling 2:

Bij kinderen vanaf 6 jaar is spirometrie zinvol bij twijfel aan of ter bevestiging van de diagnose astma.

Kernaanbeveling 3:

Bij kinderen wordt de diagnose astma **niet** gesteld als een kind alleen hoest en niet piept volgens de ouders, en de dokter hoort geen piepen bij lichamelijk onderzoek terwijl het kind wel klachten heeft. Hetzelfde geldt voor kinderen met klachten van benauwdheid bij inspanning zonder piepen of nachtelijk hoesten zonder piepen.

Kernaanbeveling 4:

Raad roken door het kind zelf, door ouders/ verzorgers of door anderen in de omgeving van het kind dringend af.

Kernaanbeveling 5:

Het voorschrijven van allergenwerende matras- en kussenhoezen is alleen zinvol als op meerdere onderdelen saneringsmaatregelen worden ingezet.

Kernaanbeveling 6:

Bij kinderen tot en met 6 jaar met (verdenking) astma wordt een bèta-2-sympathicomimeticum voorgeschreven via een dosis-aerosol met een inhalatiekamer en wordt het effect altijd na 1 tot 2 weken geëvalueerd. Bij kinderen ouder dan 6 jaar met astma dient een poederinhalator voorgeschreven te worden.

Kernaanbeveling 7:

Bij onvoldoende effect van bronchusverwijder (en goed medicatiegebruik) of bij frequente klachten (twee of meer dagen per week luchtwegklachten of twee of meer inhalaties met bronchusverwijder per dag gedurende 1 tot 2 weken nodig) is onderhoudsbehandeling met inhalatiecorticosteroiden de aanbevolen medicamenteuze therapie.

2. Atrialfibrillation/ Atriumfibrilleren (M79; 2003)

Kernaanbeveling 1:

Het hartritme dient onderzocht te worden bij de volgende klachten en bevindingen: hartkloppingen, duizeligheid in de zin van licht gevoel in het hoofd of het gevoel flauw te vallen, wegrakingen, een verminderde inspanningstolerantie, tekenen van hartfalen, een TIA of CVA.

Kernaanbeveling 2:

Bij iedere patiënt bij wie de bloeddruk wordt gemeten, wordt het ritme en de frequentie van de hartslag vastgelegd.

Kernaanbeveling 3:

Bij het vermoeden van atriumfibrilleren maakt de huisarts een ECG en laat laboratoriumonderzoek (Hb, glucose, TSH, evt. K en Kr) uitvoeren. De diagnose atriumfibrilleren wordt gesteld op basis van het ECG.

Kernaanbeveling 4:

Patiënten met atriumfibrilleren en vermoeden van een hartklepafwijking op grond van auscultatie van het hart of wanneer er onduidelijkheid bestaat over het bestaan van hartfalen, worden verwezen voor echodiagnostiek van het hart (naar cardioloog of diagnostisch centrum indien beschikbaar). Patiënten met atriumfibrilleren jonger dan 65 jaar worden verwezen naar de cardioloog voor nadere diagnostiek

Kernaanbeveling 5:

Bij patiënten ouder dan 65 jaar met paroxysmaal of chronisch atriumfibrilleren **zonder** hoog risico op TIA of CVA (afwezigheid van hypertensie (nu of in de voorgeschiedenis), diabetes mellitus, hartfalen, coronaire hartziekte of reumatische hartklepafwijking) wordt acetylsalicylzuur 80 mg per dag voorgeschreven. Bij patiënten ouder dan 65 jaar met paroxysmaal of chronisch atriumfibrilleren **met** een hoog risico op TIA of CVA (bij aanwezigheid van hypertensie (nu of in de voorgeschiedenis), diabetes mellitus, hartfalen, coronaire hartziekte of reumatische hartklepafwijking) wordt een coumarinederivaat voorgeschreven, tenzij hiervoor een contra-indicatie bestaat.

3. Cardiovascular risk management/ Cardiovasculair risicomanagement (M84; 2006)

Kernaanbeveling 1:

De huisarts brengt het cardiovasculair risicoprofiel in kaart bij:

- patiënten met hart- en vaatziekten (HVZ) of diabetes mellitus type 2 (DM2);
- patiënten die bekend zijn met een systolische bloeddruk ≥ 140 mmHg of totaal cholesterolgehalte $\geq 6,5$ mmol/l;
- rokende mannen ≥ 50 jaar en rokende vrouwen ≥ 55 jaar;
- patiënten die reeds worden behandeld met antihypertensiva of statines.

Dit risicoprofiel bestaat uit de volgende factoren:

- leeftijd;
- geslacht;
- roken;
- systolische bloeddruk;
- lipidspectrum (TC, HDL, TC/HDL-ratio, LDL, triglyceriden);
- glucosegehalte;
- familieanamnese (vader, moeder, broer of zus met HVZ <60e levensjaar);
- voeding (gebruik van verzadigd vet, vis, groente en fruit, zout);
- alcoholgebruik;
- lichamelijke activiteit;
- body mass index en middelomtrek

Kernaanbeveling 2:

Aan patiënten met HVZ, DM2 of een geschat 10-jaarsrisico van sterfte door HVZ $\geq 5\%$ (met behulp van SCORE risicofunctie of risicometer) worden adviezen gegeven over voldoende bewegen, gezonde voeding, beperkt alcoholgebruik en, indien van toepassing, stoppen met roken.

Kernaanbeveling 3:

Aan patiënten met HVZ wordt acetylsalicylzuur 1dd 80 mg voorgeschreven tenzij er een indicatie is voor orale antistollingstherapie (bijvoorbeeld bij boezemfibrilleren of structurele hartafwijking). Tevens wordt behandeling met een cholesterolverlager (statine) geadviseerd, tenzij bij een LDL $< 2,5$ mmol/l en geen sterk verhoogd risico (bijvoorbeeld recidiverend hartinfarct, sterk belaste familieanamnese of clustering van risicofactoren).

Kernaanbeveling 4:

Bij een geschat 10-jaarsrisico van sterfte door HVZ lager dan 5% is medicamenteuze behandeling van licht tot matig verhoogde bloeddruk (SBD 140-180 mmHg) en/of licht tot matig verhoogd cholesterolgehalte (TC/HDL-ratio 5-8) meestal niet zinvol.

Kernaanbeveling 5:

Indien besloten wordt tot antihypertensieve therapie bij patiënten zonder HVZ en zonder DM2, wordt geadviseerd te starten met een diureticum in een lage dosering.

Kernaanbeveling 6:

Bij medicamenteuze behandeling met cholesterolverlagers wordt geadviseerd te starten met simvastatine of pravastatine 40 mg. Bij patiënten met HVZ of DM2 waarbij de LDL-streefwaarde $< 2,5$

mmol/l niet haalbaar is, kan bij patiënten met een sterk verhoogd risico (bijvoorbeeld recidiverend hartinfarct, sterk belaste familieanamnese of clustering van risicofactoren) worden overwogen om (initieel of in tweede instantie) atorvastatine of eventueel rosuvastatine voor te schrijven.

Kernaanbeveling 7:

Na instelling van de behandeling met antihypertensiva en/of cholesterolverlagers wordt ten minste jaarlijks de therapie geëvalueerd. Het controleschema wordt verder individueel opgesteld, afhankelijk van het risicoprofiel, de (co)morbiditeit en de persoonlijke wensen.

4. Cerebrovascular accident / CVA (M81; 2004)

Kernaanbeveling 1:

Patiënten met een CVA (acute neurologische uitvalsverschijnselen, zich uitend in verlamming van ledematen of gelaat, spraakstoornissen, of anderszins) worden op korte termijn verwezen voor opname op een *stroke-unit*, tenzij de uitvalsverschijnselen slechts gering van omvang zijn of spontaan al sterk verbeteren.

Kernaanbeveling 2:

Bij patiënten met een CVA die thuisblijven omdat de uitvalsverschijnselen spontaan sterk verbeteren, wordt een cardiovasculair risicoprofiel opgesteld (zie NHG-Standaard Cardiovasculair risicomanagement). Tevens wordt direct gestart met acetylsalicylzuur 1dd 160 mg gedurende twee weken, waarna de dosering wordt verlaagd naar 1dd 80 mg.

Kernaanbeveling 3:

Bij patiënten met een CVA die thuisblijven omdat de uitvalsverschijnselen spontaan sterk verbeteren, wordt het voorschrijven van bloeddrukverlagende medicatie onmiddellijk na het CVA afgeraden. Het is beter daar twee weken mee te wachten tot de patiënt klinisch stabiel is.

Kernaanbeveling 4:

Bij patiënten met een CVA die thuisblijven, draagt de huisarts zorg voor een spoedige start van de revalidatie - in een verpleeghuis (dagbehandeling), revalidatiecentrum of thuis - en periodieke evaluatie van het beloop en de behoefte aan zorg.

Kernaanbeveling 5:

Ook in de chronische fase (d.w.z. als er geen verbetering meer te verwachten is) geeft de huisarts voorlichting aan patiënten met een CVA en hun centrale verzorgers met het accent op praktische informatie die kan bijdragen aan een zinvolle en bevredigende dagbesteding. Ook worden zij geattendeerd op activiteiten van de patiëntenvereniging zoals lotgenotencontacten, partnercontacten en voorlichtingsbijeenkomsten.

5. Depressive disorder/ Depressieve stoornis (depressie) (M44; 2003)

Kernaanbeveling 1:

De huisarts stelt de diagnose depressieve stoornis bij vijf van de volgende symptomen, waaronder ten minste één van de twee kernsymptomen*, gedurende ten minste twee weken:

- depressieve stemming gedurende het grootste deel van de dag, bijna elke dag*;
- duidelijke vermindering van interesse of plezier in alle of bijna alle activiteiten gedurende het grootste deel van de dag, bijna elke dag*;
- duidelijke gewichtsvermindering of gewichtstoename;
- slapeloosheid of overmatig slapen, bijna elke dag;
- psychomotorische agitatie of remming, bijna elke dag;
- moeheid of verlies van energie, bijna elke dag;
- gevoelens van waardeloosheid of buitensporige of onterechte schuldgevoelens, bijna elke dag;
- verminderd vermogen tot nadenken of concentratie of besluiteloosheid, bijna elke dag;
- terugkerende gedachten aan de dood, terugkerende suïcidegedachten zonder dat er specifieke plannen zijn gemaakt, of een suïcidepoging of een specifiek plan om suïcide te plegen

Kernaanbeveling 2:

Het beleid wordt vooral bepaald door de mate van de lijdensdruk en het disfunctioneren en afgestemd op de voorkeuren en wensen van de patiënt.

Kernaanbeveling 3:

Bij depressieve klachten, waarbij niet aan de criteria voor een depressieve stoornis wordt voldaan (zie kernaanbeveling 1), worden antidepressiva **niet** aangeraden omdat hiervan geen relevante effecten te verwachten zijn.

Kernaanbeveling 4:

Indien een behandeling met antidepressiva wordt gestart, kan de huisarts kiezen voor een tricyclisch antidepressivum (TCA) of een specifieke serotonineheropnameremmer (SSRI). De keuze wordt in overleg met de patiënt bepaald en hangt af van de aanwezigheid van contra-indicaties, co-morbiditeit, potentiële bijwerkingen en eerdere ervaringen.

Kernaanbeveling 5:

Na vier tot zes weken wordt het effect van de medicatie en eventuele bijwerkingen geëvalueerd. Bij voldoende respons en geen of acceptabele bijwerkingen wordt de medicatie in principe 6 maanden voortgezet.

6. Eye Inflammation ('Red eye')/ Het rode oog (M57; 2006)

Kernaanbeveling 1:

Bij een rood oog gepaard gaande met pijn, daling van het gezichtsvermogen of lichtschuwheid (indien niet veroorzaakt door keratoconjunctivitis fotoelectrica, corpus alienum of ander trauma), wordt de visus bepaald, de pupillen en pupilreacties beoordeeld en nader onderzoek van de cornea verricht met behulp van fluoresceïnekleuring.

Kernaanbeveling 2:

Bij diffuse roodheid en afwezigheid van jeuk, alarmsymptomen (pijn, visusdaling of lichtschuwheid) en cornea-afwijkingen, is er waarschijnlijk sprake van een infectieuze conjunctivitis. Indien de klachten korter dan drie dagen duren of er bestaat niet veel hinder, kan worden afgewacht zonder antibiotische behandeling.

Kernaanbeveling 3:

Als bij een (vermoedelijk) bacteriële conjunctivitis (diffuse roodheid, 's ochtends dichtgeplakte ogen en afwezigheid van jeuk, alarmsymptomen en cornea-afwijkingen) wordt besloten tot antibiotische behandeling, gaat de voorkeur uit naar chlooramfenicol oogzalf 1% 2-4 dd. Bij een blefaritis kan ook fusidinezuur worden voorgeschreven, in andere gevallen van conjunctivitis is dit middel niet zinvol gezien de resistentieontwikkeling.

7. Rhinosinusitis/ Rhinosinusitis (M33; 2005)

Kernaanbeveling 1:

Bij patiënten met rhinosinusitis geeft de huisarts voorlichting over het gunstige beloop van rhinosinusitis en adviezen over symptoombestrijding (stomen, (fysiologische) zoutoplossing via neusdruppels of spray, decongestiva, pijnstilling).

Kernaanbeveling 2:

Uitsluitend bij patiënten met een (verhoogd risico op een) afwijkend beloop wordt een antimicrobiële behandeling overwogen, d.w.z. bij:

- een patiënt die ernstig ziek is;
- alarmsymptomen (oedeem of roodheid van de oogleden van één oog, visusstoornissen zoals acuut verminderde visus of gestoorde volgbeweging, neurologische symptomen zoals meningeale prikkeling of uitvalsverschijnselen, suf of apathisch gedrag, en slecht drinken bij zuigelingen);
- opnieuw koorts na een aantal koortsvrije dagen binnen één klachtenepisode;
- klachten die in een periode van 2 weken niet afnemen;
- meer dan 3 klachtenepisodes per jaar;

- een gestoorde afweer (zoals slecht ingestelde diabetici, chronische corticosteroïdengebruikers, HIV-patiënten met een verlaagd aantal T-cellen, patiënten die een chemotherapeutische of radiotherapeutische behandeling ondergaan)

In deze gevallen wordt doxycycline of amoxicilline voorgeschreven gedurende één week. Bij kinderen jonger dan 13 jaar, bij zwangeren en bij vrouwen die borstvoeding geven is amoxicilline het middel van eerste keus. Bij allergie of intolerantie kan de huisarts kiezen voor erytromycine of azitromycine.

8. Sexually transmissible diseases/ Het soa-consult (M82; 2004)

Kernaanbeveling 1:

Volg bij patiënten zonder klachten maar met ongerustheid na seksueel contact, in overleg met de patiënt, het volgende onderzoeksbeleid:

- bij heteroseksuele jongeren: onderzoek chlamydia en gonorroe.
- bij wisselende heteroseksuele contacten: onderzoek chlamydia en gonorroe en bij grote ongerustheid tevens syfilis, hepatitis B, HIV-infectie.
- bij homo- of biseksuele contacten, homo- of biseksuele partner, of als patiënt of diens partner werkzaam is in prostitutie of prostituant is: onderzoek chlamydia, gonorroe, syfilis, hepatitis B en HIV-infectie.
- als partner intraveneuze drugsgebruiker is: onderzoek hepatitis B en HIV-infectie.
- als patiënt en/of partner afkomstig zijn uit HIV-endemische gebieden: onderzoek chlamydia, gonorroe, syfilis, hepatitis B en HIV-infectie.
- als patiënt en/of partner afkomstig zijn uit hepatitis-B-virus-endemische gebieden: onderzoek hepatitis B.

Kernaanbeveling 2:

Verricht bij mannen met een urethritis (afscheiding uit de penis of pijn in de urethra met leukocyturie (>10 leukocyten per gezichtsveld in het sediment van de eerstestraalsurine)) onderzoek naar een chlamydia-infectie en gonorroe en start direct met (eenmalig) 1 gram azitromycine oraal. Geef bij een grote kans op gonorroe (purulente afscheiding, klachten enkele dagen na contact waarbij besmetting zou hebben plaatsgevonden, prostitutie, homo- of biseksueel contact), of wanneer de kans dat er geen vervolcontact zal zijn groot is, eenmalig 1 gram azitromycine oraal plus eenmalig 1 gram cefotaxim intramusculair.

Kernaanbeveling 3:

Chlamydiadiagnostiek bij een vrouw wordt verricht door afname van materiaal voor PCR uit cervix en urethra. Voor het uitsluiten van Chlamydia bij een vrouw **zonder** klachten is een PCR op urine of een door de vrouw zelf afgenomen uitstrijk met een vaginale wat (indien beschikbaar) ook voldoende.

Kernaanbeveling 4:

De huisarts motiveert patiënten met een chlamydia-infectie, gonorrhoe of acute hepatitis B om de seksuele partner(s) tot een half jaar terug te waarschuwen en op te sporen. Bij dragerschap van het hepatitis-B-virus moeten alle seksuele partners en gezinsleden worden gewaarschuwd. Als de patient HIV-positief is, is het zinvol zo mogelijk alle seksuele partners uit het verleden op te sporen, eventueel vanaf het moment dat een eerdere test negatief was. Als de patiënt het moeilijk vindt om contact op te nemen, kan de huisarts hiervoor schriftelijk materiaal (een zogenaamde waarschuwingsstrook van de Stichting Soa-Aids-Nederland) meegeven of de GGD inschakelen voor contactopsporing, bijvoorbeeld bij anonieme contacten.

9. Sleeping disorder/ Slaapproblemen en slaapmiddelen (M23; 2005)

Kernaanbeveling 1:

Bij slapeloosheid vindt aanvullend onderzoek alleen plaats op grond van ervaren klachten. Bij het *restless legs* syndroom wordt het Hb en MCV bepaald.

Kernaanbeveling 2:

De huisarts geeft voorlichting over wat onder normale slaap wordt verstaan en probeert te zorgen voor een meer relativerende opstelling van de patiënt ten opzichte van een korte slaap.

Kernaanbeveling 3:

Bij 'gewone' slapeloosheid worden slaapadviezen of ontspanningsoefeningen gegeven en is slaapmedicatie niet nodig.

Kernaanbeveling 4:

Slaapmedicatie wordt overwogen bij acute psychosociale problemen, bij passagère verstoring van het dag-/nachtritme, zoals bij een jet lag, en bij chronische somatische aandoeningen met aanhoudende klachten ondanks specifieke therapie.

Kernaanbeveling 5:

Indien men kiest voor slaapmedicatie, schrijft men een kortwerkend middel voor, zoals temazepam 10-20 mg (ouderen 10 mg) of zolpidem 5-10 mg (ouderen 5 mg), niet meer dan 5 tot 10 tabletten, met als gebruik zo nodig of intermitterend. Dagelijks gebruik moet worden vermeden.

Kernaanbeveling 6:

Bij chronisch slaapmiddelengebruik probeert men de patiënt te laten stoppen via een minimale interventiestrategie (met behulp van stopbrieven, beschikbaar via NHG-Patiëntenbrieven).

Kernaanbeveling 7:

Bij slaapapneu, narcolepsie en een ernstige vorm van het vertraagde slaapfasesyndroom (te laat afgestemde biologische klok) dient men de patiënt door te verwijzen voor nadere diagnostiek en/of behandeling.

10. Thyroid disorder/ Schildklieraandoeningen (M31; 2006)

Kernaanbeveling 1:

Streef bij de behandeling van een patiënt met **hypothyreoïdie** naar een normale TSH-waarde en stel de medicatie (met levothyroxine) verder bij op grond van klachten. Spreek in de instelfase, niet eerder dan zes weken na de laatste doseringsverandering, een laboratoriumcontrole (TSH en vrij T4) af. In het eerste jaar nadat de patiënt klachtenvrij is geworden en het TSH en vrije T4 door medicatie zijn genormaliseerd, vinden de controles elke drie maanden plaats. Spreek vervolgens een jaarlijkse controle af, levenslang.

Kernaanbeveling 2:

Indien de huisarts specifieke kennis heeft van schildklieraandoeningen kan een patiënt met **hyperthyreoïdie** (ziekte van Graves) door de huisarts medicamenteus worden behandeld via de combinatiemethode. Hierbij wordt de schildklier eerst volledig stilgelegd met een thyreostaticum (bij voorkeur thiamazol 1dd30 mg), waarna levothyroxine wordt bijgegeven. Bespreek de voor- en nadelen van de verschillende behandelopties (medicamenteus, radioactief jodium, chirurgie) met de patiënt en betrek hem of haar bij de besluitvorming.

Kernaanbeveling 3:

De huisarts verwijst patiënten met een solitaire nodus of met een dominante nodus in een multinodulair struma naar een internist voor aanvullende diagnostiek.

11. Transient Ischemic Attack/ TIA (M45; 2004)

Kernaanbeveling 1:

De huisarts stelt de diagnose *transient ischaemic attack* (TIA) als:

- de uitvalsverschijnselen acuut en zonder voortekenen waren begonnen en zich binnen 5 minuten volledig ontwikkeld hadden;
- alle verschijnselen tegelijk ontstonden en de uitval langer dan 1 minuut duurde;
- de uitvalsverschijnselen niet meer bij lichamelijk onderzoek aanwezig zijn;
- de uitvalsverschijnselen te verklaren zijn vanuit een stoornis in de bloedvoorziening van de hersenen door de linker of rechter a. carotis interna of de a. basilaris (zie tabel).

Tabel: Uitvalsverschijnselen die passen bij een TIA

Lokalisatie stoornis in bloedvoorziening	Neurologisch begrip	Verschijnselen
Arteria carotis interna sinistra*	Hemiparese	totale of gedeeltelijke verlamming of vaardigheidsstoornis van de rechter bovenste extremiteit, rechter onderste extremiteit en het rechter aangezicht
	Sensibiliteitsstoornis†	doof, verminderd of tintelend gevoel van de rechter arm, het rechter been of het rechter aangezicht
	Homonyme hemianopsie‡	zwart of niets zien met beide ogen in de rechter helft van het gezichtsveld
	Afasie	niet op de goede woorden komen, gesproken taal niet begrijpen, de woorden wel weten, maar deze niet kunnen uitspreken of vreemde woorden zeggen
	Dysartrie‡	onduidelijke spraak
	Amaurosis fugax	zwart of niets zien met het linker oog. Soms betreft de uitval alleen het onderste of bovenste deel van het gezichtsveld. Er zijn gewoonlijk geen andere uitvalsverschijnselen.
Arteria basilaris	Parese	totale of gedeeltelijke verlamming of vaardigheidsstoornis die zich niet per se beperkt tot een lichaamshelft
	Sensibiliteitsstoornis	doof, verminderd of tintelend gevoel in linker of rechter lichaamshelft of beiderzijds
	Hemianopsie‡	zwart of niets zien met beide ogen in de linker of de rechter helft van het gezichtsveld
	Combinaties van:†	
	vertigo	draaiduizeligheid
	dysartrie‡	onduidelijk spreken
	diplocie	boven of naast elkaar zien van twee gelijke beelden, hetgeen verdwijnt als een van de ogen wordt gesloten
	dysfagie	verslikken
ataxie	stuurloosheid of zwalken (dronkemansgang)	

* Een stoornis in de bloedvoorziening door de arteria carotis interna dextra gaat gepaard met dezelfde uitvalsverschijnselen, maar dan aan de andere kant. Afasie treedt dan echter alleen op als het spraakcentrum in de rechter hersenhelft is gelokaliseerd, hetgeen doorgaans het geval is bij linkshandigen.

† Indien deze verschijnselen geïsoleerd voorkomen, mag de diagnose TIA niet gesteld worden.

‡ Op basis van een hemianopsie of dysartrie zonder andere uitvalsverschijnselen valt niet uit te maken of de stoornis in de cerebrale bloedvoorziening in de arteria basilaris of een van de carotiden gelokaliseerd is.

Kernaanbeveling 2:

Bij patiënten met een TIA wordt een cardiovasculair risicoprofiel opgesteld (zie NHG-Standaard Cardiovasculair risicomangement). Tevens wordt gestart met acetylsalicylzuur 1dd 160 mg ineens, waarna de behandeling (levenslang) wordt voortgezet met 1dd 80 mg. Daarnaast komen zij in aanmerking voor (2 x daags 200 mg) dipyridamol met gereguleerde afgifte (zie addendum). Bij atriumfibrilleren heeft het gebruik van een coumarinderivaat de voorkeur boven acetylsalicylzuur. Bij contra-indicaties voor acetylsalicylzuur is clopidogrel een goed alternatief.

Kernaanbeveling 3:

Patiënten met voorbijgaande uitvalsverschijnselen die wijzen op een stoornis in het stroomgebied van de arteria carotis interna (zie tabel), worden binnen drie dagen verwezen naar de neuroloog voor een duplexscan (combinatie van echografie en dopplersonderzoek), om te beoordelen of er een indicatie bestaat voor carotis-chirurgie.

12. Urinary Tract Infections/ Urineweginfectie (M05; 2005)

Kernaanbeveling 1:

Het urineonderzoek bij klinische verdenking op urineweginfecties bestaat in eerste instantie uit een nitriettest, waarna bij een negatieve uitslag een dipslide wordt ingezet.

Kernaanbeveling 2:

Ongecompliceerde urineweginfecties, d.w.z. urineweginfecties bij niet-zwangere, overigens gezonde vrouwen, dienen in eerste instantie behandeld te worden met nitrofurantoïne. Bij overgevoeligheid voor nitrofurantoïne wordt trimethoprim geadviseerd.

Kernaanbeveling 3:

Bij een gecompliceerde urineweginfectie, d.w.z. bij tekenen van weefselinvasie (koorts, rillingen, algemeen ziek-zijn, flank- of perineumpijn) of urineweginfectie bij patiënten uit een risicogroep (mannen, zwangere vrouwen, personen jonger dan 12 jaar, patiënten met afwijkingen aan de nieren of urinewegen in de voorgeschiedenis (zoals ernstige nierinsufficiëntie, cystennieren, nierstenen, een neurogene blaas of bemoeilijkte mictie), patiënten met een verminderde weerstand (zoals tgv. bestraling, immunosuppressiva of diabetes mellitus), patiënten met een verblijfskatheter) dient voorafgaand aan de behandeling urine te worden verzameld voor kweek en resistentiebepaling.

Kernaanbeveling 4:

Bij een gecompliceerde urineweginfectie dienen patiënten **met** tekenen van weefselinvasie, evenals alle jongens tot 12 jaar, meisjes tot en met 4 jaar en daarnaast patiënten met aandoeningen van de nieren of urinewegen, een verminderde weerstand (m.u.v. diabetes) of een verblijfskatheter, gedurende 10 dagen te worden behandeld met amoxicilline/ clavulaanzuur, totdat de uitslag van de kweek en resistentiebepaling bekend is. Bij overgevoeligheid dient dit te worden vervangen door co-trimoxazol of een fluorochinolon (norfloxacin 2dd400 mg of ciprofloxacine 2dd500 mg, maar niet in de zwangerschap of tijdens lactatie of bij leeftijd < 16 jaar).

Kernaanbeveling 5:

Bij een gecompliceerde urineweginfectie bij patiënten zonder tekenen van weefselinvasie dienen mannen, zwangeren, meisjes van 5-12 jaar en diabetes gedurende 7 dagen te worden behandeld met

nitrofurantoïne totdat de uitslag van de kweek en resistentiebepaling bekend is. Bij overgevoeligheid voor nitrofurantoïne wordt gekozen voor 7 dagen trimethoprim.



Chapter 4

Guidelines on uncomplicated urinary tract infections are difficult to follow: perceived barriers and suggested interventions

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Abstract

Background: Urinary tract infections (UTI) are among the most common health problems seen in general practice. Evidence-based guidelines on UTI are available, but adherence to these guidelines varies widely among practitioners for reasons not well understood. The aim of this study was to identify the barriers to the implementation of a guideline on UTI perceived by Dutch general practitioners (GPs) and to explore interventions to overcome these barriers.

Methods: A focus group study, including 13 GPs working in general practices in the Netherlands, was conducted. Key recommendations on diagnosis and treatment of uncomplicated UTI were selected from the guideline. Barriers to guideline adherence and possible interventions to address these barriers were discussed. The focus group session was audio-taped and transcribed verbatim. Barriers were classified according to an existing framework.

Results: Lack of agreement with the recommendations, unavailable and inconvenient materials (i.e. dipslides), and organisational constraints were perceived as barriers for the diagnostic recommendations. Barriers to implementing the treatment recommendations were lack of applicability and organisational constraints related to the availability of drugs in pharmacies. Suggested interventions were to provide small group education to GPs and practice staff members, to improve organisation and coordination of care in out of hour services, to improve the availability of preferred dosages of drugs, and to pilot-test guidelines regionally.

Conclusions: Despite sufficient knowledge of the recommendations on UTI, attitudinal and external barriers made it difficult to follow them in practice. The care concerning UTI could be optimized if these barriers are adequately addressed in implementation strategies. The feasibility and success of these strategies could be improved by involving the target group of the guideline in selecting useful interventions to address the barriers to implementation.

Background

Urinary tract infection (UTI) is one of the most common health problems for which patients seek medical care. It is responsible for about 1% of all general practitioner (GP) consultations in the UK ¹ and results in approximately 7.9 million physician visits in the United States annually ². In the Netherlands, UTIs rank 8th on the list of most common reasons for visiting a GP and also account for 1% of all visits ³. Most of these are uncomplicated UTIs, defined as cystitis in non-pregnant adult women. In the Dutch healthcare system, uncomplicated UTI is diagnosed and treated by GPs and rarely needs specialist care.

To optimize care concerning uncomplicated UTI, evidence-based clinical guidelines have been developed in several countries ⁴. However, adherence to these guidelines has shown to be far from optimal. In a large study among a representative sample of general practices in the Netherlands, it was found that GPs followed the guideline with respect to the treatment of UTIs in 42% of the cases and that the level of adherence varied widely (0-95%) between practices ⁵. A recent study showed that Dutch GPs treated UTIs according to the guideline in 50% of the cases ⁶. In other countries similar levels of adherence regarding the treatment of UTIs were found ⁷⁻⁹. Reasons underlying GPs suboptimal behaviour are thus far poorly understood ⁶⁻⁹.

An analysis of barriers to the implementation of a guideline is considered to be a first important step in improving guideline adherence ^{10, 11}. The barriers identified can subsequently be used to develop tailored implementation strategies. Little is known on how to translate the identified barriers into tailored interventions. Several studies have shown that the choice of a specific intervention in practice is not necessarily based on the analysis of barriers ¹², but is often determined by personal preferences or familiarity with some types of interventions ^{10, 13}. Moreover, the target users of the guideline are usually not involved in selecting implementation strategies to improve adherence ¹⁴.

The aim of our study was to identify the perceived barriers to implementation of a national guideline on uncomplicated UTI among Dutch GPs and to explore

interventions that could address these barriers. By conducting an in-depth analysis of barriers and possible interventions to achieving change among the target group, we aimed to provide useful suggestions for improving the care concerning uncomplicated UTI.

Methods

Setting: the GP in the Dutch Healthcare system

In the Netherlands, the GP has a central role in primary care as both family physician and gatekeeper to specialist care. Nearly all (99%) Dutch citizens are registered with a GP. Consultation of GPs is free and co-payments for drugs and other services are very low compared to other countries¹⁵. GPs also deliver primary care in out of hours services, which are organised by regional collaborative groups¹⁶. Almost all GPs are member of the Dutch College of General Practitioners (NHG), which is responsible for guideline development, education, and practice support¹⁷. Since late 1980s the NHG has developed more than 80 national guidelines for general practice, including a guideline on UTI.

Study design

We conducted a focus group session among a sample of Dutch GPs (N=13) working in practice. Focus groups are considered as useful methods to explore cognitions and motivations underlying behaviour, providing detailed information on perceived barriers and resistance¹⁸⁻²¹. In addition, focus groups often encourage creative thinking, which can be particularly useful in exploring interventions to address the barriers to guideline adherence. The focus group session on UTI was part of a larger study on guideline implementation; the results of this study were published elsewhere²².

Selection of participants

GPs were recruited by Stichting KOEL, a foundation responsible for continuing medical education for GPs in the South-Western part of the Netherlands²³, through advertising in their electronic newsletter and website. The GPs were offered continuing medical education accreditation points (2 hours). One week in advance to the session,

they received a copy of a summary of the guideline. All thirteen GPs that registered for the UTI focus group session, participated.

UTI guideline and key recommendations

The UTI guideline developed by the NHG was published in 1989²⁴ and updated in 1999²⁵ and in 2005²⁶. In 1999 the recommendations on diagnosing UTI changed in preferring the dipslide method above microscopic urinary investigation. In 2005, the classification of diagnostic categories changed, i.e. only UTIs in patients without particular risk factors or concomitant diseases, in otherwise healthy, non-pregnant women, are considered as uncomplicated. Due to increased bacterial resistance to trimethoprim, nitrofurantoin is recommended as the drug of first choice and the recommended duration of treatment with nitrofurantoin was extended from 3 to 5 days. A summary of the 2005 guideline concerning uncomplicated UTI is provided in Table 1.

Table 1 – Summary of the Dutch guideline on uncomplicated UTI 2005 (second revision)

- History taking is paramount for diagnosis of UTI. If history is typical, urinalysis is not necessary in non pregnant, otherwise healthy women.
 - Urinalysis consists of a nitrite dipstick test, followed by a urine dipslide test in case of a negative nitrite test.
 - A UTI is defined as a positive nitrite test or a dipslide with at least 10^4 colony-forming units per ml urine.
 - If a woman has complaints similar to an earlier uncomplicated UTI, empirical treatment can be considered without urinalysis.
 - In uncomplicated urinary tract infections, i.e. cystitis in non-pregnant, otherwise healthy women, nitrofurantoin (5 days) is the drug of first choice. In case of hypersensitivity, trimethoprim (3 days) is recommended.
 - Fluorochinolonen should only be prescribed based on the specific results of a urine culture including antibiotic resistance pattern.
-

Focus group session

The GPs had a semi-structured discussion about barriers to the implementation of the recommendations of the UTI guideline. They were also asked to suggest interventions to address the barriers to implementation. In this study implementation is defined as the introduction of an innovation into daily routine; this demands removal of barriers to change by using strategies that have been shown to be effective in practice²⁷. We therefore considered all potential barriers that may hinder physicians from following

the guideline recommendations consistently in practice. A checklist with relevant topics based on an existing framework of barriers ²⁸, including guideline knowledge, attitude towards the guideline, external barriers to guideline adherence and suggested interventions to address the barriers, was used to structure the discussion. The session was chaired by a GP with 15 years of experience in general practice (JB), and co-chaired by one of the authors (ML). The session was held at Sticking KOEL in Zwijndrecht, the Netherlands in 2008, and was audio taped.

Data analysis and synthesis

The audio taped discussion was transcribed verbatim. We used Cabana's framework of guideline barriers ²⁸ to classify and analyse the data. According to this framework, guideline adherence can be affected by three main categories of barriers, which are divided into several sub-categories of barriers: 1) knowledge-related barriers (lack of awareness and lack of familiarity), 2) attitude-related barriers (lack of agreement, lack of self-efficacy, lack of outcome expectancy and lack of motivation/inertia of previous practice) and 3) external barriers that limit physicians' ability to apply the guideline in practice (guideline factors, environmental factors and patient factors).

Two of the authors (ML and JZ) independently studied the transcripts and classified comments about barriers according to the framework of Cabana et al. ²⁸. If necessary, additional types of barriers, not covered by the existing framework, were formulated. Discrepancies in classification between the two authors were discussed until consensus was reached.

Results

Description of participants

Most of the participants were male (69%), were aged between 45 and 54 years (54%), were working in a group practice (46%) and had their practice located in a rural area or small town (54%). Compared to the Dutch population of GPs ²⁹, GPs working in group practices and in practices located in a rural area or small town were slightly overrepresented.

Perceived barriers to diagnosis of UTIs

The participants were familiar with the recommendations on diagnosis. One of the perceived barriers to diagnosing UTI was a lack of agreement with the guideline recommendation (Table 2). Some GPs disagreed with performing the nitrite dipstick test only and preferred to combine this test with leukocyte esterase dipstick test, which is often available on the same strip. Reason for disagreement was that they argued the evidence supporting this recommendation.

"I am always using the whole strip because of the evidence. Though a positive leukocyte test does not provide much information, a negative leukocyte test does. That's why I am in favour of still performing a leukocyte test".

The complete dipstick test is often used in practice to replace the dipslide, in particular when symptoms are mild and patients agree with watchful waiting if the test is negative. The GPs also questioned the applicability of the recommendation concerning the use of the dipslide in case of serious or severe complaints. In these cases, GPs did not always apply the dipslide.

"It [diagnosis] also depends on the severity of the complaints. If the patient has serious complaints and she should have waited until the next day for the results, I usually do not use the dipslide method at all".

In addition, some GPs mentioned that dipslides are inconvenient to use in practice and not always available, both in their own practice and in out of hours services.

"I am aware of the recommendation, but I think the dipslide is inconvenient to apply in practice and that is why I don't use it. Moreover, I could not even use it, because I do not have a dipslide in my practice".

They also mentioned organisational barriers to performing dipslides on Friday and during the weekends in out of hour services.

"You can basically use the dipslide only from Monday until Thursday [...].If you have a patient on Sunday, there is no one [practice assistant or GP] available to read the results of the dipslide on Monday".

Another barrier within the own organisation related to the recommendation on diagnosis was that routines and habits of practice assistants need to be changed, for instance, that in the case of symptoms of recurrent uncomplicated UTIs, empirical treatment could be started without urinalysis:

"The big change in our practice was that assistants should first take patient's history before urinalysis, and that urinalysis is not always indicated. We tried to write a new protocol for them, but the assistants argued that they often receive the urine from patients without knowing the history of the patient".

Suggested interventions to improve adherence

To improve guideline adherence concerning the diagnosis of uncomplicated UTI, GPs suggested that more efforts are needed to raise awareness of the supporting evidence of guideline recommendations (Table 2). They emphasized that it is insufficient to just disseminate the guideline, and that they need to be convinced by strong arguments why they should change their routines. According to the GPs, discussing guideline recommendations and the accompanying scientific background information in small peer review groups would be a useful method.

"In my experience, it is not enough to just read the guideline or guideline summary. Then I will not be convinced and will not change my routines [...]. You really need to 'do' something with it, such as discussing the guideline recommendations in small group of GPs, exchanging arguments, and discussing pros and cons. Then it will have an effect".

To reduce organisational constraints, GPs suggested that it might be useful to develop protocols specifically targeting practice assistants:

"It would be really helpful to develop a protocol for practice assistants, in addition to the guideline. Because they do most of the work! "

Table 2 – Barriers to adherence and suggested interventions to improve adherence to recommendations on diagnosing uncomplicated UTI

	Perceived barriers	Suggested interventions
<i>Barriers related to knowledge</i>	No barriers	Not applicable
<i>Barriers related to attitudes</i>		
<i>Lack of agreement with recommendation</i>	<p><u>Lack of evidence:</u> Arguing supporting evidence for performing only the nitrite dipstick test (rather than combining it with leukocyte esterase dipstick test).</p> <p><u>Lack of applicability:</u> Belief that benefits do not outweigh patients' discomfort due to time to wait for results of dipslide, particularly in case of serious complaints.</p>	<p><u>Small group education:</u> Provide detailed information on supporting evidence of recommendations and discuss recommendations in peer review groups.</p>
<i>External barriers</i>		
Environmental factors		
<i>Organisational constraints</i>	<p><u>Within organisation:</u></p> <ul style="list-style-type: none"> - Difficult to change routines of practice assistants. - Not possible to apply the dipslide on Friday (nobody available to read the results on Saturday). <p><u>Outside organisation:</u> Difficult to apply dipslide in weekend in out of hour service, particularly on Sunday (nobody available to read the results on Monday).</p>	<p><u>Dealing with diagnosing UTI in out of hours:</u></p> <ul style="list-style-type: none"> - Develop regional protocols for weekend based on local agreements with hospitals. - Provide method for arranging local agreements in national guideline. - Adapt guideline recommendation to current practice by not recommending using dipslides in out of hour services.
<i>Lack of/inconvenient resources/material</i>	<p><u>Lack of availability/inconvenience:</u> Dipslides are inconvenient and difficult to apply in practice and not everywhere available.</p>	

In addition, they mentioned that it would be useful to develop regional protocols on diagnosing UTI in out of hours services.

"There is a need for information on how to deal with diagnosing UTIs in the weekend. An option is to develop local protocols that include agreements with [specialists in] local hospitals [..]. I also think that the national guideline should pay attention to this issue{....}, for instance by suggesting to develop a protocol including arrangements with hospitals".

Finally, it was suggested to adapt the guideline recommendation to current practice, by not recommending the use of dipslides in out of hour services.

"My opinion is that dipslides should not be used at all in out of hour services".

Perceived barriers to the treatment of uncomplicated UTIs

Barriers related to the treatment of uncomplicated UTIs were related to lack of agreement with the recommendation and to environmental factors (Table 3). GPs often prescribe trimethoprim rather than nitrofurantoin as a first choice drug because they believe that the benefits of prescribing nitrofurantoin do not outweigh the discomfort for patients:

"Nitrofurantoin needs to be taken four times a day. And I think it makes a big difference just taking one tablet in the evening or taking four tablets a day"

Some GPs disagreed with using trimethoprim as second choice drug due to lack of applicability to their practice population. They mentioned that they could not prescribe trimethoprim (in case of hypersensitivity for nitrofurantoin) because of regional patterns of resistance:

"We changed our [drug prescription] policy due to bacterial resistance. Trimethoprim is third choice now. I even know a city where it is just not an option anymore!"

GPs also reported organisational barriers related to the availability of drugs in pharmacies. Recommended drugs (nitrofurantoin) were often not available in the preferred user friendly dosages:

"I think you may conclude that nitrofurantoin - twice a day 100 mg - is not available in the Netherlands. And as a result we have a problem in practice with user convenience. I think that is a serious problem".

Table 3 – Barriers to adherence and suggested interventions to improve adherence to recommendations on treatment of uncomplicated UTI

	Perceived barriers	Suggested interventions
<i>Barriers related to knowledge</i>	No barriers	Not applicable
<i>Barriers related to attitudes</i>		
<i>Lack of agreement with recommendation</i>	<p><u>Lack of applicability:</u></p> <ul style="list-style-type: none"> - Belief that recommendation is not applicable to patient population due to local patterns of bacterial resistance. - Belief that benefits do not outweigh patients' discomfort (taking drug 4 times a day) of prescribing drug of first choice. 	<p><u>Pilot-testing of guidelines on resistance:</u></p> <p>Guidelines should be tested on regional patterns of bacterial resistance of the recommended drugs.</p> <p><u>Availability of user friendly dosage of drugs:</u></p> <p>The recommended drugs should be available in a user friendly dosage.</p>
<i>External barriers</i>		
Environmental factors		
<i>Organisational constraints</i>	<p><u>Outside organisation:</u></p> <p>Recommended drugs are not available in the preferred dosage (nitrofurantoin).</p>	<u>Idem</u>

Suggested interventions to improve adherence

Interventions mentioned to address these barriers were to increase the availability of recommended drugs (Table 3). GPs urged that nitrofurantoin should be available in amore user friendly dosage.

"It's simple: get furabid [nitrofurantoin] back in the preferred dosage of twice a day 100 mg!"

In addition, GPs suggested that guidelines should be pilot tested regionally by determining the bacterial resistance pattern of the recommended drugs.

"National guidelines are okay, but you need to test them locally to find out whether they are applicable".

Discussion

In this focus group study we identified the main barriers to the implementation of a national guideline on uncomplicated UTI perceived by Dutch GPs and explored interventions that could address these barriers. We found that the recommendations on both diagnosis and treatment were difficult to follow in practice and determined a specific set of barriers that needs to be addressed to improve adherence. Although GPs were aware of the recommendations, attitudinal and external barriers prevented them from following the recommendations consistently in practice. The care concerning UTI could be improved, if these barriers are sufficiently addressed. Several interventions for overcoming these barriers were suggested by the GPs, providing opportunities for guideline developers, implementers, and GPs in practice.

With regard to diagnosing uncomplicated UTI, one of the main barriers was that GPs disagreed with the recommendation because they argued the supporting evidence. Previous studies showed that adherence to recommendations based on scientific evidence is higher than to recommendations that are not supported with evidence ^{30, 31}. However, providing evidence-based recommendations in guidelines is not enough. More efforts are needed to raise awareness among GPs with the evidence supporting the recommendations and to convince them with strong arguments why they should change their current practice. Discussing the recommendations in peer review groups may be a useful method as the effectiveness of interactive small group education has been demonstrated ^{32, 33}. Since the barriers are mainly related to attitude, an educational program addressing GPs' attitudes in addition to knowledge transfer, may be particularly effective ^{34, 36}.

Organisational constraints to performing dipslides in out of hour services were also mentioned as barriers. Some GPs perceived the use of dipslides in general as inconvenient and do not have a supply in practice. This is consistent with other Dutch studies showing that GPs hardly use the dipslide in case of a negative nitrite test, particularly in out of hours services ^{6, 37}. A suggested intervention is to adapt the recommendation to current practice, i.e. not using dipslides in out of hours services, which is more consistent with guidelines in other countries ⁴. Another option, not mentioned in our focus group session, is to hand dipslides over to the patients and ask them to show it the next day in out of hours services (Saturday; Sunday) or to the own GP (Monday). Although the dipslide has high diagnostic accuracy, the guideline could also offer alternative options for diagnosis in specific circumstances. Improving the organisation and coordination in out of hours services by developing local protocols and agreements with hospitals was also suggested by the GPs.

One of the barriers to implementing the treatment recommendation on uncomplicated UTI in practice was a perceived lack of applicability due to local patterns of bacterial resistance. Bacterial resistance to commonly prescribed antibiotics in uncomplicated UTIs has been increasing in recent years ³⁸⁻⁴⁰ and resistance patterns have been found to differ significantly between regions ⁴¹. As a result, national guidelines may not always be regionally applicable. Although some regional variation in bacterial resistance in general practices in the Netherlands was reported in 2004 ⁴², up to date and conclusive evidence for the existence of such variation is not available. However, it seems useful to pilot test guidelines by systematically monitoring the regional resistance patterns. If there is strong variation, the recommendations in the guideline could be regionally adapted to specific patterns of resistance.

Another barrier perceived by GPs is that drug dosages recommended in the guideline are not always available at pharmacies. Some GPs did not want to prescribe drugs that need to be taken four times a day because of user inconvenience, and therefore do not prescribe the drug of first choice. It would be helpful if guideline developers consider the availability of drug dosages to optimize the implementability of recommendations. Negotiation with national pharmacy organisations may be helpful to reach these goals.

By focusing on the individual recommendations within the guideline, we were able to gain an in-depth understanding of the barriers and the interventions needed to address them. The use of a predefined framework of barriers to implementation triggered physicians to think about a broad range of barriers and potential interventions to improve guideline acceptance and guideline adherence²⁸. Our approach appeared to be useful in exploring a wide range of barriers and potential interventions and had an educational effect as well²². Moreover, by involving the target group of GPs in exploring interventions to address these barriers, we expect that the feasibility and effectiveness of interventions will improve. These methods can be applied in implementation programs on a range of topics and in other settings as well.

A limitation of our study is that we organised only one focus group. The participants were motivated GPs and those with a positive attitude towards guidelines may be overrepresented. However, our sample of GPs does correspond quite well in terms of basic characteristics to the total population of Dutch GPs. In addition, by offering accreditation points to the GPs, creating an incentive to participate for less motivated GPs as well, we attempted to reduce this bias. Secondly, the number of participants in our study was limited, making it difficult to quantify our findings. However, our aim was to explore the relevant barriers qualitatively instead of quantifying their relative importance. As our sample seems to be representative in terms of basic characteristics, we assume having described a substantial variation in barriers and interventions perceived by Dutch GPs. An electronic survey among a larger sample of GPs will follow to quantify our findings.

We only included GPs in our focus group session, while guideline adherence often also depends on other staff members in general practice. Changing habits and routines of practice assistants may be as difficult as those of GPs. Specific protocols and educational sessions for practice assistants may be useful. Quality improvement programs, involving all practice staff, such as NHG Practice Accreditation (NPA), could facilitate this process⁴³.

Finally, our study was based on a Dutch guideline questioning the generalisability of our findings to other countries. Guidelines on UTI in different countries differ substantially, particularly concerning diagnosis recommendations⁴. For example, most guidelines do not recommend the use of dipslides. Interventions to address barriers regarding this method may therefore not be relevant. However, barriers regarding topics such as the organisation of care in out of hours services will be relevant to other countries as well, as management of UTI often happens out of hours. Problems with antibiotic resistance patterns and availability of drugs also apply to other countries. Regional pilot testing of the guideline may be useful in many countries, even in smaller ones. Moreover, our methods used to determine barriers to implementation among guideline users are applicable in other countries as well.

Conclusions

Despite GPs' awareness of the guideline recommendations, our study showed that several attitudinal and external barriers prevented them from consistently following the recommendations on uncomplicated UTI in practice. Guideline implementation could be improved if guideline developers and implementers are aware of the potential barriers and involve all relevant staff members in the implementation strategies. Educational programs addressing providers' attitudes in addition to knowledge transference, and improving the coordination and organisation of care, could improve adherence to the guideline on uncomplicated UTI. Involving the target group in selecting useful interventions to implement the guideline recommendations may improve the feasibility and success of implementation strategies.

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A person wearing a white lab coat and white high-heeled shoes is walking on a paved path. They are carrying a black bag filled with various medicine boxes, including brands like 'Dermolone', 'Dermolone 50', and 'Josacilin 50'. The background is a blurred outdoor setting with trees and a path.

Chapter 5

Knowledge, attitudes and use of the guidelines for the treatment of moderate to severe plaque psoriasis among Dutch dermatologists

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Abstract

Background: In 2003, the Dutch psoriasis guidelines were among the first evidence-based medicine guidelines in dermatology. Although pivotal, the implementation of dermatological guidelines has not been assessed.

Objectives: To evaluate various aspects that affect implementation of clinical guidelines such as knowledge, attitudes and practices among dermatologists.

Methods: A cross-sectional anonymous postal survey was conducted among all Dutch dermatologists. In addition to questions about knowledge and practices, 24 items assessed guidelines attitudes. Factor analysis was applied to merge these items into attitudinal scales and multiple linear regression was used to identify predictors for these scales.

Results: Of the 353 dermatologists, 161 (46%) completed the questionnaire. Almost all respondents were aware of the guidelines and 60% reported to have a decent knowledge of their content. Factor analysis retained 22 items divided into three scales: usefulness and content, barriers, and reliability. Apart from some disagreement on the user-friendliness and communication facilitating properties, the dermatologists' attitudes were generally positive. A larger volume of patients with psoriasis was associated with more frequent use of the guidelines [adjusted odds ratio (OR) = 2.42; 95% confidence interval (CI) 1.02–5.72]. Good familiarity predicted a more positive attitude towards the guidelines' usefulness and content ($P < 0.001$), perceived barriers ($P < 0.001$), and more frequent use in practice (adjusted OR = 8.38; 95% CI 3.08–22.81).

Conclusions: Dutch dermatologists seem to know and appreciate their psoriasis guidelines and use them more often when they have a larger psoriasis population. Enhancing the familiarity of the guidelines among users may result in a more positive attitude towards them and a higher frequency of use.

Introduction

In 2003, the Dutch Society for Dermatology and Venereology (NVDV) together with the Dutch Institute for Healthcare Improvement introduced national practice guidelines for the treatment of moderate to severe chronic plaque-type psoriasis in the Netherlands ¹. These psoriasis guidelines were among the first national guidelines in dermatology. For each treatment, efficacy, safety, patients' perspectives, costs and follow-up were evaluated ². An updated version was presented in 2005 including an additional chapter on biological treatments ³. The Dutch psoriasis guidelines were used as the basis for the recently published German guidelines on the treatment of psoriasis vulgaris ⁴.

Experts on psoriasis developed the guidelines by a commonly accepted methodology of evidence-based guideline development, based on evidence from scientific literature and consensus among experts when the literature is insufficient ⁵. The Appraisal of Guidelines Research and Evaluation (AGREE) instrument, which is considered a standard instrument in the quality assessment of guidelines, emphasizes the need for an evaluation after the introduction of a guideline (item: 'the evaluation of implementation of the developed guideline over time') ⁶. The implementation of dermatological guidelines has rarely been reported; one Australian survey evaluated the management of primary cutaneous melanomas before and after the publication of the melanoma guidelines and a small survey among 42 Scottish dermatologists assessed their management of basal cell carcinoma and compared this with the existing guidelines ^{7,8}. Some surveys were conducted as a prelude to consensus conferences, of which one was actually followed by a survey to examine the impact of the guidelines ⁹⁻¹¹. Past evaluations of the Dutch psoriasis guidelines focused on specific sections such as adherence to the guidelines with respect to methotrexate treatment or home ultraviolet B phototherapy, but none evaluated the implementation of the complete psoriasis guidelines ^{12,13}. Although there are many dermatological guidelines, very few have been evaluated and none has used a standardized instrument.

The psoriasis guidelines have been introduced in multiple ways, trying to reach all Dutch dermatologists, including approval by the member meeting of the NVDV, postal delivery of hard copy with a summary card, online access, publication in Dutch medical journals, and presentations and discussion forums at national meetings. However, it has been demonstrated that changing physicians' behaviour is extremely difficult¹⁴. From a psychological perspective, this is called the 'knowledge-behaviour gap', implicating the difference between what we know we should do and what we actually do in clinical practice^{14,15}.

The objective of this survey is to assess the implementation of the Dutch psoriasis guidelines by focusing on awareness, knowledge, attitudes and use of the guidelines among a large sample of Dutch dermatologists. In addition, an instrument for the evaluation of guidelines is presented and multivariate models were used to investigate physicians' and practice characteristics that were associated with the study outcomes.

Materials and methods

Study design and population

An anonymous postal survey was conducted among the 357 members of the NVDV. Between January and May 2007, all members received a letter announcing our survey, two full questionnaires and two reminder letters. Dermatologists were given the opportunity to excuse themselves from further mailings after the first round by calling, writing, or emailing to one of the investigators. At several regional and national meetings dermatologists were motivated to return the questionnaire.

Questionnaire content

The 12-page, standardized questionnaire consisted of 44 questions and was divided into five sections. The first part assessed demographic as well as professional characteristics of the dermatologists such as age, sex, residency programme, years in practice, time spent weekly on patient contacts, and type of practice. The second section assessed the familiarity and attitudes towards and use of the current Dutch guidelines on moderate to severe plaque psoriasis. Views on the guidelines were

examined with 24 statements, based on 14 items from the 'Attitudes Towards Guidelines' scale, which we extended with 10 additional statements related to guideline attitudes¹⁶. In addition, 11 questions were asked to assess the motivation of using guidelines. The last section questioned dermatologists on their experience with traditional and biological therapies of psoriasis and the reimbursement criteria of the biological¹⁷.

The survey included multiple response formats. Demographic and practice items were categorical variables. Age was categorized into 10-year subgroups to respect responders' privacy. Attitudinal questions (1, strongly disagree; 5, strongly agree), familiarity with the guideline (1, none; 5, very good), and frequency of use (1, never; 5, always) were scored on a five-point Likert scale with free space at the end of the question for additional suggestions.

Statistical analysis

The proportion of responders was calculated as a percentage from the eligible population. We used the χ^2 test to determine the statistical significance of differences in the distribution of the categorical variables age and gender between responders and nonresponders.

To reduce the number of dependent variables and improve the interpretation of the data, an exploratory factor analysis was performed to examine the underlying dimensions of the 24 items that assessed guideline attitudes. Factor analysis is based on the assumption that items (e.g. questions) sharing similar underlying dimensions are highly correlated and items that measure dissimilar dimensions yield low correlations. On the basis of this assumption, factor analysis is able to assign items to scales and each scale reflects a different dimension¹⁸. For this analysis, principal axis factor (PAF) analysis was used followed by oblique rotation, which assists in achieving a simpler and theoretically more meaningful factor pattern by assuming that the factors will be correlated¹⁸. For determining the number of factors to be retained, the Kaiser–Guttman rule (i.e. eigenvalue > 1) was applied first, followed by Cattell's scree test. An eigenvalue > 1 indicates that more common variance than unique variance is explained

by that factor¹⁸. The scree test focuses on the magnitude of changes in eigen-values from factor to factor and identifies the most appropriate factor solution when the eigenvalues decrease minimally at subsequent factors. Items with loadings of 0.40 or higher were assigned to a factor. If item loadings were less than 0.40 and/or showed a difference of less than 0.10 on multiple factors, they were eliminated from the analysis (i.e. item complexity)¹⁹.

Multivariate linear regression analyses investigated the association between dermatologists' characteristics including their familiarity with the guidelines and the retained factors of the attitudes towards the psoriasis guidelines. Independent variables included were gender, duration of certification (continuous variable), type of practice (none, peripheral, academic, both), days of patient care a week (3 days or less, 4 days or more), number of patients with psoriasis per month (less than 15 or more than 15), familiarity with the guidelines (not to moderate or good to very good). As age was only determined per category, duration of certification, which is a proxy for age, was included in the multivariate model. The presence of multicollinearity was tested by determining the variance inflation factor (VIF) and tolerance value per variable. Cut-off values were a VIF > 4 and tolerance < 0.25.²⁰ The above-mentioned independent variables were also used in multivariate logistic regression models to examine determinants of the familiarity with the guidelines (none to moderate or good to very good) and the frequency of using the guidelines (never to sometimes or usually to always).

Results

Study population

Of the 357 members of the NVDV, four dermatologists were excluded because they were retired or no longer active as a dermatologist. Among the remaining 353 dermatologists, the overall response rate was 46% (161 / 353) and three responders returned the questionnaire without answering a single item. The characteristics of the 161 respondents are presented in Table 1. About 60% were men and 65% were aged 45 years or older. Almost 80% were affiliated to nonacademic hospitals, with about

two-thirds working at least 4 days a week and 53% seeing more than 15 patients with psoriasis monthly. Nonresponders did not differ significantly from responders with respect to age and gender ($P = 0.16$ and $P = 0.64$, respectively). The working affiliation of the respondents also showed a comparable distribution as described in the original population in 2004, with 72% working in a non-academic hospital and 23% in an academic hospital¹³.

Table 1 – Demographic and professional characteristics of dermatologists (n = 161)

Demographic and characteristics	n	(%) ^a
Gender		
Male	101	(62.7)
Female	60	(37.3)
Age (years)		
25-34	9	(5.6)
35-44	48	(29.8)
45-54	60	(37.3)
55-64	38	(23.6)
> 65	6	(3.7)
Years of registration as a dermatologist		
Before 19080	15	(9.3)
1980-1989	45	(28.0)
1990-1999	54	(33.5)
After 2000	40	(24.8)
Practice type		
Peripheral hospital	128	(79.5)
University hospital	33	(20.5)
Days per week committed to patient care		
2 or less	15	(9.3)
3	40	(24.8)
4	65	(40.4)
5	39	(24.2)
Number of patients with psoriasis seen monthly		
<5	15	(9.3)
5-15	51	(31.7)
>15	86	(53.4)

^aNumbers may not add up to 161 and percentages may not add up to 100% due to missing values.

Factor analysis

Factor analysis resulted in six factors with an eigen-value > 1.0. However, a scree plot suggested a three-factor or four-factor solution. Therefore, both solutions were investigated with PAF analysis using oblique rotation to evaluate for simple structure. The three-factor solution seemed most meaningful in describing the dimensionality of attitudes towards the guidelines (Table 2). Factor 1 comprised 11 items that addressed how responders rated the usefulness and content of the guidelines, factor 2 contained

nine items which were related to practical and organizational barriers, and the two items of factor 3 assessed the perceived reliability of the guidelines. Two items showed item complexity, 'show too little consideration for the wishes of the patient' and 'challenge the autonomy of care providers'. Because of their important and unique content, they were classified into the factor they most logically represented, factor 1 and 2, respectively. Of the 24 items, the retained 22 accounted for 44% of the total variance and the Cronbach's alpha of the factors were 0.79, 0.83 and 0.79.

Knowledge, attitudes and use of guidelines

Nearly all (96%) participating dermatologists were aware of the existence of the national psoriasis guidelines and almost 70% also knew about the chapter on biological therapies that was added in 2005. Overall, 60% self-rated their knowledge of the guidelines as good to excellent.

Attitudes towards the usefulness and content of the guidelines varied from more than 70% of the participants who thought they can improve the quality of health care to 31% who agreed they can facilitate communication with patients and families (Fig. 1). However, 17% of the responders agreed that the current guidelines showed too little consideration for the wishes of the patient. Their usefulness as an educational tool as well as a convenient source of advice found agreement in 60% of the responders, although only 33% considered the guidelines user-friendly. Assessment of practical and organizational barriers for implementation showed that the availability of the guidelines was extremely high. More than 60% disagreed with the statement that guidelines are not valued in their organization or are too expensive to implement and half of the responders disagreed that these guidelines oversimplify medical practice or challenge their autonomy. They were considered reliable guidelines: approximately 80% thought these guidelines were based on scientific evidence and made by experts. Less than a quarter of the participants indicated that the guidelines represent the opinion of a small group of experts. About 60% indicated that an update of these guidelines should occur more than once every 5 years.

Table 2 – Principal axis factor analysis with oblique rotation of the items assessing the attitudes towards the guidelines^a

Item	Factor 1 ^b	Factor 2 ^b	Factor 3 ^b
In practice well feasible ^c	0.793		
Clear and specific ^c	0.740		
Useful as educational tool ^c	0.718		
User-friendly ^c	0.707		
Resemble daily practice ^c	0.697		-0.220
A convenient source of advice ^c	0.605		
Meet my expectations ^c	0.561		
Represent the latest state of science ^c	0.502		
Can facilitate communication with patients ^c	0.427		
Can improve the quality of health care ^c	0.426		
Show too little consideration for the wishes of the patient ^c	-0.392	0.251	0.412
Implementation is too expensive for us ^d		0.748	
I have not seen these guidelines in our health care unit ^d		0.628	-0.285
Difficult to find if needed ^d		0.596	
Not valued in our organization ^d	-0.262	0.594	
Oversimplify medical practice ^d		0.536	0.210
Occupational competence is insufficient for adopting the latest guidelines ^d		0.527	
Most of our team members have disapproving attitudes about these guidelines ^d		0.486	
Implementation is not possible because of pressure of work and lack of time ^d	-0.264	0.474	0.251
Challenge the autonomy of care providers ^d		0.413	0.367
Based on scientific evidence ^c	0.300	-0.286	0.560
Made by experts ^c	0.271	-0.213	0.540
Represent the opinion of a limited group of colleagues	-0.388	0.220	
Need to be updated more than once every 5 years			0.203
Cronbach's alpha	0.794	0.831	0.788

^aPrincipal axis factor analysis reduces the data into theoretically meaningful underlying dimensions and oblique rotation helps to achieve a simpler, theoretically more meaningful factor pattern by assuming that the factors will be correlated. ^bLoading of the items on the different factors. Absolute values of < 0,20 are suppressed. As a general rule, variables with large loadings indicate that they are representative of the factor, while small loadings suggest that they are not. ^cFactor 1: usefulness and content. ^dFactor 2: practical and organizational barriers. ^eFactor 3: reliability.

Three-quarters of the participating dermatologists used the guidelines in daily practice. Most physicians used the hard copy and about a third used them sometimes and another third on a more regular basis. Reasons for implementing the guidelines are presented in Figure 2. Checking for contraindications (85%) and efficacy of therapy (76%) were the most common reasons for using these guidelines, while they were least frequently used for medical–legal grounds or as a part of visitation (44% and 40%, respectively).

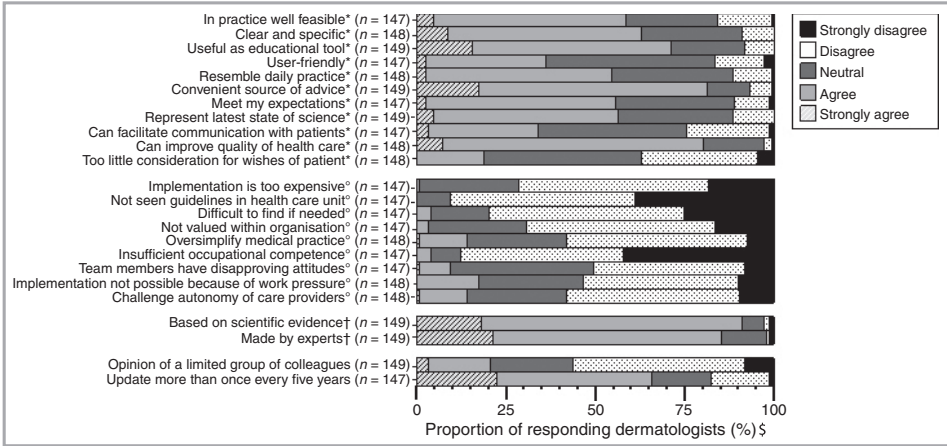


Figure 1 – Attitudes towards psoriasis guidelines

*Factor 1: usefulness and content; °Factor 2: practical and organizational barriers; †Factor 3: reliability.

§Distribution of responses among participants who completed the corresponding item.

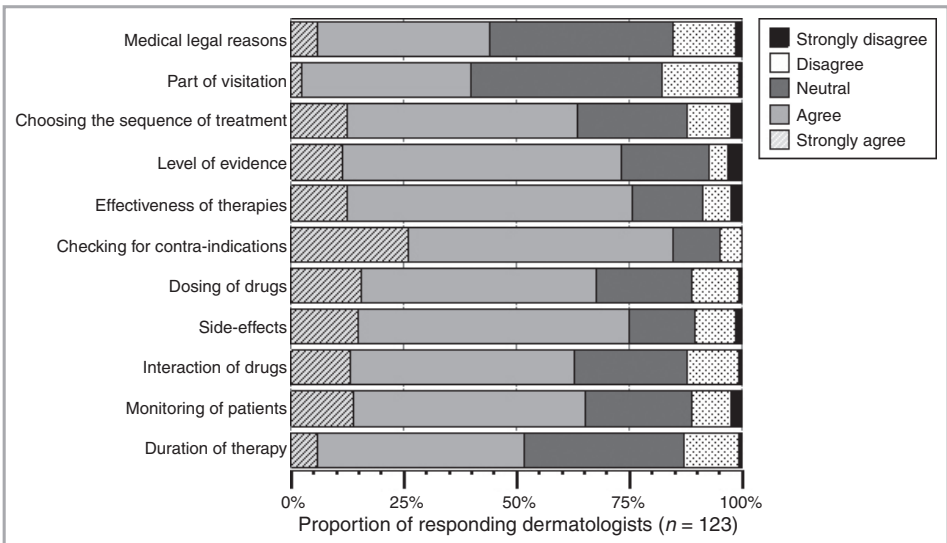


Figure 2 – Reasons for implementing the guidelines

Determinants of knowledge of guidelines

Multivariate logistic regression did not show any significant associations between the variables presented in Table 1, such as gender, duration of certification, type of practice, days of patient care a week, and number of patients with psoriasis seen monthly, and the degree of awareness of the guidelines (data not shown).

Determinants of attitudes towards guidelines

Collinearity statistics did not show any variables with a VIF > 4 or a tolerance < 0.25. Therefore, all previously described physician and practice setting characteristics as well as the familiarity with the guidelines were included in the multivariate linear regression. None of the dermatologists' characteristics was a significant predictor for any of the attitude scales. Good to very good familiarity with the guidelines was the only variable that was significantly associated with a more positive attitude towards the usefulness and content (B = 0.32, P < 0.001) as well as the practical and organizational barriers scale (B = 0.39, P < 0.001) after adjusting for gender, duration of certification, type of practice, days of patient care a week and number of patients with psoriasis seen monthly.

Determinants of self-reported use of guidelines

Multivariate logistic regression of personal and professional characteristics showed that responding dermatologists who saw more than 15 patients with psoriasis monthly were two times more likely to use the guidelines than those who saw fewer than 15 patients with psoriasis monthly [adjusted odds ratio (OR) = 2.42; 95% confidence interval (CI) 1.02–5.72]. Adding the degree of familiarity with the guidelines showed that those responders with good to very good familiarity were eight times more likely to use them more frequently (adjusted OR = 8.38; 95% CI 3.08–22.81). After adding the different attitude scales to the multivariate logistic regression, a more positive attitude towards the usefulness and content scale (adjusted OR = 3.57; 95% CI 1.45–8.81) as well as the practical and organizational barriers scale (adjusted OR = 2.58; 95% CI 1.10–6.04) was significantly associated with more frequent use of the guidelines.

Discussion

This survey revealed that among the responding Dutch dermatologists there is a high self-reported awareness and familiarity with the Dutch psoriasis guidelines. A review of 46 surveys on the awareness of guidelines and 31 surveys on the familiarity with guideline recommendations found a median unawareness rate of 54% and a unfamiliarity rate of 57%¹⁴. However, in our study almost all responders were aware of the existence of the guidelines, which may be due to the effort of distributing the guidelines among the members of the NVDV, selection bias (i.e. those responding are more likely to be aware than the non-responders) or ascertainment bias (i.e. physician self-report of awareness may affect our findings but it is likely to be limited)²¹. These same remarks also apply to the high reported familiarity, although the degree of familiarity showed some variation, with 35% reporting only a limited to moderate familiarity. In multivariate models, no physician characteristics were predictive for the level of familiarity with the guidelines.

Three scales were formatted out of the 24 items that assessed the attitudes towards these guidelines. The two questions that showed mild item complexity were considered to provide unique information and were, therefore, included in the most appropriate scales. Inspection of the factor loadings, content validity and the high internal consistency suggests that the factor analyses resulted in three meaningful scales. Nevertheless, it remains an exploratory factor analysis that needs to be confirmed in future validation studies.

The views towards the usefulness and content of the guidelines were overall supportive, with a majority of dermatologists judging them as an instrument that can improve the quality of health care, and serve as an educational tool and convenient source of advice. However, many dermatologists question whether the psoriasis guidelines facilitate patient communication and their user-friendliness, which is not surprising because the guidelines consist of 120 pages (and a summary card). Easy-to-use, concise evidence summaries may improve the user-friendliness of the guidelines. The costs of implementation, the guidelines' availability and appreciation in

organizations were not considered as practical or organizational barriers for implementation and half of the responders disagreed that guidelines were oversimplifying or challenged their autonomy. In contrast to our findings, other Dutch medical specialists and pharmacologists perceived organizational and financial barriers to be of importance ^{22, 23}. Assessment of the perceived reliability showed that, in accordance with other studies, dermatologists indicated confidence in guidelines that were developed by their own society ^{24, 25}. The associations between greater familiarity with the psoriasis guidelines and better attitudes towards their usefulness and content as well as the practical and organizational barriers were to be expected, and confirm the internal validation of this survey. Further enhancing familiarity with the guidelines may overcome possible barriers that prevent dermatologists from using them.

Although the frequency varied, most respondents used the psoriasis guidelines but a quarter did not use them at all in daily practice. The self-assessment of physician practice may over- or underestimate actual practice when compared with chart audits or patient surveys ^{26–28}. To limit this ascertainment bias, the survey was strictly anonymous. The most important motivations for implementing the guidelines were therapy related, such as checking for contraindications, efficacy and adverse events.

Dermatologists who cared for a larger volume of patients with psoriasis more frequently used the guidelines, confirming their usefulness in daily practice. Positive attitudes towards usefulness and content as well as the practical and organizational barriers were associated with increased use of the guidelines. Responders who were more familiar with the guidelines had a more positive attitude towards them and used them more often, suggesting that the ‘knowledge–behaviour gap’ is limited in this population.

This is one of the first extensive evaluations of a (national) guideline in dermatology among more than 150 dermatologists. Based on an existing questionnaire and additional items, an instrument and its scales were created using factor analysis. Despite multiple attempts to motivate peers to complete the questionnaire, the response rate was only 46% (161 responders). However, the specific content and

extensiveness of the survey make it likely that at least one dermatologist of most of the approximately 130 dermatological partnerships in the Netherlands, with particular interest in the treatment of psoriasis, participated. It has also been demonstrated that physicians adapt to their colleagues of the particular hospital in which they work and that the social environment in which physicians work is more important for their medical behaviour than their formal professional education ²⁹. Taking this perspective into account, the results of this survey are probably a good representation of the dermatological care for psoriasis in the Netherlands, perhaps even better than initially would be expected from the individual level response rate. A study on the effects of non-response bias in mail surveys of physicians showed that higher response rates across different medical specialties were not always associated with lower response bias. Although increasing response rates can reduce or eliminate response bias for some variables, it is more important to assess correctly their potential consequences on survey estimates ³⁰.

The strictly anonymous study design assured that responders could freely express their opinion, but limited the comparison of responders and nonresponders. No difference was found for age categories and gender, but it is likely that responders were more familiar, had positive attitudes and used the guidelines more frequently compared with nonresponders. Even though the findings of this study cannot be generalized to all Dutch dermatologists, they do reflect the views and opinions of those who actually use the guidelines and examined factors associated with the outcomes. Unfortunately, because of the likely response bias it was not possible to explore the characteristics of dermatologists who do not use the guideline and their underlying motivations. Although difficult, in future research it would be interesting to examine the rationale of dermatologists who do not use the guidelines to improve the implementation rates further.

In conclusion, 5 years after the introduction of the Dutch psoriasis guidelines, they seem to be well known, appreciated and considered reliable. The degree of familiarity with the guidelines was the single most important predictor of a more positive attitude of dermatologists towards the guidelines and frequency of using them. Hopefully, other countries with national dermatology guidelines will also assess the implementation of their guidelines and the attitudes towards the guidelines among their end-users.

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Chapter 6

Current guidelines have limited applicability to patients with comorbid conditions

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Submitted

Abstract

Background: Guidelines traditionally focus on the diagnosis and treatment of single diseases. As almost half of the patients with a chronic disease have more than one disease, the applicability of guidelines may be limited. The aim of this study was to assess the extent that guidelines address comorbidity and to assess the supporting evidence of recommendations related to comorbidity.

Methods: We focused on four highly prevalent chronic conditions with a high impact on quality of life: chronic obstructive pulmonary disease (COPD), depressive disorder, diabetes mellitus type 2, and osteoarthritis. Using two publicly-available sources, the National Guideline Clearinghouse (NGC) and the Guidelines International Network Library (G-I-N), we selected evidence-based guidelines on these conditions published since 2005. Data were abstracted from each guideline on the extent that comorbidity was addressed (general comments, specific treatment recommendations), the type of comorbidity discussed (concordant, discordant), and the supporting evidence of recommendations related to comorbidity (level of evidence, translation of evidence).

Results: Twenty guidelines met our inclusion criteria. Of the 20 guidelines, 17 (85%) addressed the issue of comorbidity and 14 (70%) provided specific recommendations on comorbidity. In general, the guidelines included few recommendations on patients with comorbidity (mean 3 recommendations per guideline, range 0 to 26). Of the 59 comorbidity-related recommendations provided, 46 (78%) addressed concordant comorbidities. The strength of the evidence supporting these recommendations was moderate for 25% (15/59) and low for 37% (22/59) of the recommendations. In addition, for 73% (43/59) of the recommendations the evidence was not adequately translated into the guidelines.

Conclusions: Our study showed that the applicability of current evidence-based guidelines to patients with comorbid conditions is limited. Most guidelines do not provide explicit guidance on treatment of patients with comorbidity, particularly for discordant combinations. Guidelines should be more explicit about the applicability of their recommendations to patients with comorbidity. More research evidence is needed on the optimal management of patients with the most prevalent combinations of chronic conditions.

Introduction

Traditionally, medical care is focused on the prevention, diagnosis and treatment of single diseases ¹. Most research studies focus on the effectiveness of disease-specific interventions and patients with comorbidity or complex problems are often excluded from clinical trials ^{2, 3}. In clinical practice, physicians are encouraged to adhere to evidence-based clinical practice guidelines (CPGs), as these are regarded as important tools for quality improvement ⁴. In line with both clinical practice and research traditions, most CPGs are disease-oriented documents focusing on the diagnosis and management of single diseases ⁵.

The emphasis of CPGs on single diseases may be problematic. Almost half of patients with chronic diseases have more than one disease ^{6,7}. Managing multiple conditions is more complex than managing single diseases and clinicians may find it challenging to provide optimal care for patients with multiple conditions ⁸⁻¹⁰. Particularly when conditions are discordant, i.e. if they are not directly related in either their pathogenesis or management and do not share an underlying predisposing factor, patients are more likely to report conflicting instructions and problems with coordination of care ¹¹⁻¹³.

To the extent that CPGs focus on single diseases, they may offer insufficient guidance to physicians about care for patients with multiple conditions. Lack of applicability of CPGs due to comorbidity may pose an important barrier to guideline adherence among physicians ^{14, 15}. Moreover, adhering to single disease CPGs in caring for patients with multiple conditions may adversely affect patient safety, if recommended treatments for one condition conflict with those for another condition ¹⁶.

Although prior studies suggest that physicians may find it challenging to provide care to patients with comorbidity, there are few systematic assessments of the comorbidity-related content of CPGs, and in particular the quality of the evidence that supports that content. The aim of this study was to explore the applicability of CPGs to patients with comorbidity by assessing the extent to which CPGs on high-prevalence chronic

conditions address comorbidity and by assessing the quality of the evidence cited in support of recommendations related to comorbidity.

Methods

Data sources

Two publicly-available international databases, the National Guideline Clearinghouse (NGC) and the Guidelines International Network Library (G-I-N), were used to select the guidelines.

Study selection

Selection of chronic conditions

In selecting the conditions, we focused on highly prevalent chronic diseases that have a high impact on quality of life. Both major depressive disorder^{17, 18} and diabetes mellitus type 2^{19, 20} are highly prevalent and have been found to have a high impact on quality of life, particularly in combination^{17, 21}. We also included chronic obstructive pulmonary disease (COPD) and osteoarthritis, as pain and dyspnea may have a considerable impact on quality of life as well.

Selection of clinical practice guidelines

Guidelines were included if they:

- included a set of recommendations with an explicit link to their supporting evidence;
- were published in 2005 or later;
- addressed the treatment or management of the selected conditions;
- were published in English;
- were accessible in the public domain

CPGs were excluded if they focused on a specific subgroup of patients (e.g. pregnant women, children, adolescents, homeless people).

Data extraction

One of the investigators (ML) abstracted data from the selected CPGs and the abstraction process was checked by a second investigator (JB). Any disagreement was resolved by discussion. General data were retrieved from the CPGs, and more detailed information was collected on the specific recommendations addressing comorbidity and their supporting evidence:

Guideline

- General characteristics of the guideline: title; organization; country; target group; year of publication; number of pages and references; number of treatment recommendations.
- Characteristics of the guideline related to comorbidity: issue of comorbidity addressed (prevalence data, screening/diagnosing for comorbidity; considering comorbidity in treatment); discussion of patient-centered aspects (such as goals and burden of treatment, incorporating patient preferences), inclusion of specific comorbidity related treatment recommendations (number and proportion). A recommendation was defined as a statement whose apparent intent is to provide guidance about the advisability of a clinical action ²². Contra-indications for medication or surgery were not considered as specific comorbidity related recommendations, if no alternative treatments were provided.

Recommendation

- Type of recommendation: type of treatment addressed (general treatment, drug therapy, life-style advice, surgery, other); inclusion of patient-centered aspects.
- Number of comorbid conditions addressed
- Type of comorbidity addressed: concordant or discordant. Concordant conditions were defined as representing the same overall pathophysiological risk profile and being more likely to be the focus of the same disease and self management plan ¹². Discordant treatments are not directly related in either their pathogenesis or management. For each of the included conditions the authors developed a scheme of concordant and discordant comorbidities (Appendix 1). For diabetes, we did not consider cardiovascular risk factors such as hypertension

and hyperlipidemia as concordant conditions but as part of the disease, because adequate management of diabetes is cardiovascular risk management including monitoring blood pressure and lipids.

Evidence

- Link with underlying evidence described; (yes, no)
- Number of underlying studies
- Level of evidence of underlying studies: high, moderate, low, not available. As grading systems differ per guideline, we considered the highest level of evidence as high, the lowest level as low, and intermediate levels as moderate.
- Translation of evidence: good, moderate or poor/unclear. Our judgment was based on the directness of the evidence and on whether the strengths and limitations of the evidence were discussed in the guideline. The translation was graded as: ‘good’ if the supporting evidence of the studies focused (at least partly) on the comorbidity part of the recommendation and the strengths and limitations of the supporting evidence were discussed in the guideline; as ‘moderate’ if either the supporting evidence of the studies focused (at least partly) on the comorbidity part of the recommendation or the strengths and limitations of the supporting evidence were discussed in the guideline; and as ‘poor or unclear’ if neither the supporting evidence of the studies focused on the comorbidity part of the recommendation nor were the strengths and limitations of the supporting evidence discussed in the guideline.

Results

A total of 20 CPGs met our inclusion criteria, having been published in English and in the public domain since 2005 (Table 1). Six of the CPGs addressed COPD, four addressed major depressive disorder, seven addressed diabetes mellitus type 2 and three addressed osteoarthritis.

Table 1 – Basic characteristics of selected guidelines (N= 20)

Title of guideline	Organization that developed guideline	Country	Year of publication	Number of pages	Number of references
COPD					
1. Chronic obstructive pulmonary disease	Singapore Ministry of Health	Singapore	2006	84	155
2. Diagnosis and management of Chronic obstructive pulmonary disease (COPD)	Institute for Clinical Systems Improvement (ICSI)	USA	2009		97
3. Diagnosis and management of stable chronic obstructive pulmonary disease: a clinical practice guideline from the American College of Physicians	American College of Physicians	USA	2007	6	54
4. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease	Global Initiative for Chronic Obstructive Lung Disease - Disease Specific Society (WHO), National Heart, Lung, and Blood Institute (U.S.)	Several countries	2008	94	435
5. Australian Lung Foundation & The Thoracic Society of Australia and New Zealand - The COPD-X Plan: Australian and New Zealand Guidelines for the management of Chronic Obstructive Pulmonary Disease 2006	New Zealand Guidelines Group (NZGG)	New Zealand	2006	66	243
6. Canadian Thoracic Society Recommendations for Management of Chronic Obstructive Pulmonary Disease, CTS (CA)	Canadian Thoracic Society	Canada	2007	28	366

Table 1 – Basic characteristics of selected guidelines (N= 20)

Title of guideline	Organization that developed guideline	Country	Year of publication	Number of pages	Number of references
DEPRESSIVE DISORDER (MAJOR)					
7. Major depression in adults in primary care	Institute for Clinical Systems Improvement (ICSI)	USA	2008	84	244
8. Identification of common mental disorders and management of depression in primary care	New Zealand Guidelines Group (NZGG)	New Zealand	2008	188	580
9. Using Second-Generation Antidepressants to Treat Depressive Disorders: A Clinical Practice Guideline from the American College of Physicians	American College of Physicians (ACP)	USA	2008	10	100
10. A. Depression: the treatment and management of depression in adults (update) (CG90)	National Institute for Health and Clinical Excellence (NICE)	United Kingdom	2009	64 (full guideline 585)	0 (full guideline > 1000)
DIABETES MELLITUS TYPE 2					
11. American Association of Clinical Endocrinologists medical guidelines for clinical practice for the management of diabetes mellitus	American Association of Clinical Endocrinologists, American College of Endocrinology	USA	2007	68	564
12. Diabetes mellitus	Singapore Ministry of Health	Singapore	2006	161	260
13. Diagnosis and management of type 2 diabetes mellitus in adults	Institute for Clinical Systems Improvement (ICSI)	USA	2008	89	126
14. Guidelines on diabetes, pre-diabetes, and cardiovascular diseases	European Society of Cardiology	Several European countries	2007	72	711
15. Standards of medical care in diabetes	American Diabetes Association	USA	2008	43	332

Table 1 – Basic characteristics of selected guidelines (N= 20)

Title of guideline	Organization that developed guideline	Country	Year of publication	Number of pages	Number of references
16. National evidence-based guidelines for type 2 diabetes mellitus (DI 7 - DI 13) (Part 1, 3, 4, 5 & 7)	National Health and Medical Research Council (NHMRC)	Australia	2005	928	>1000
17. Type 2 diabetes - the management of type 2 diabetes (partial update) + newer agents (CG87)	National Institute for Health and Clinical Excellence (NICE)	United Kingdom	2009	49+ 102= 151 (full guideline 259)	0 (full guideline 414)
OSTEOARTHRITIS					
18. Osteoarthritis of the knees	Singapore Ministry of Health	Singapore	2007	51	91
19. The care and management of osteoarthritis in adults	National Institute for Health and Clinical Excellence (NICE)	United Kingdom	2008	22 (full guideline 316)	0 (full guideline 386)
20. Ottawa Panel evidence-based clinical practice guidelines for therapeutic exercises and manual therapy in the management of osteoarthritis	Ottawa Panel	Canada	2005	65	178

Eight CPGs were retrieved from the G-I-N database, six from the NGC database and six were available in both databases. The largest share of these 20 CPGs were produced in the United States (n=7). Nine CPGs were produced by governmental agencies; five by professional societies and six by other types of organizations. The CPGs were predominantly developed in 2008 (7/20) and in 2007 (5/20).

Applicability of guidelines to patients with comorbidity

Of the 20 guidelines, 17 (85%) addressed the issue of comorbidity (Table 2). Eight guidelines (40%) provided comorbidity prevalence data, 16 guidelines (80%) recommended screening for comorbid conditions and 17 guidelines (85%) recommended considering comorbidity in treatment. Guidelines on depressive

disorder and diabetes mellitus type 2 (100%) more often addressed the issue of comorbidity compared to the guidelines on COPD (83%) and osteoarthritis (33%).

Fourteen (70%) guidelines provided specific treatment recommendation for patients with comorbid conditions. The number of recommendations varied from 1 to 26 per guideline, with an average of 3 per guideline. The guidelines on COPD and osteoarthritis provided the fewest numbers of recommendations (0.7 per guideline), whereas the guidelines on diabetes mellitus type 2 included an average of 6.3 comorbidity-related recommendations.

Table 2 – Characteristics of guidelines (N=20) in terms of addressing comorbidity

Guidelines	COPD (N=6)		DEP (N=4)		DM II (N=7)		OA (N=3)		TOTAL (N=20)	
	N	%	N	%	N	%	N	%	N	%
<i>Issue of comorbidity addressed</i>	5	83	4	100	7	100	1	33	17	85
Provision of comorbidity prevalence data	3	50	2	50	2	29	1	33	8	40
Screening/diagnosing for comorbidity	5	83	3	75	7	100	1	33	16	80
Considering comorbidity in treatment	5	83	4	100	7	100	1	33	17	85
Inclusion of patient centered aspects	4	67	3	75	4	57	1	33	12	60
<i>Includes specific comorbidity related treatment recommendation(s)</i>	3	50	4	100	6	86	1	33	14	70
Mean number of recommendations per guideline (range)	0.7	(0-2)	2.3	(1-4)	6.3	(0-26)	0.7	(0-2)	3.0	(0-26)

COPD = Chronic Obstructive Pulmonary Disease; DEP = Major depressive disorder; DMII = Diabetes Mellitus type 2; OA = Osteoarthritis

The 20 guidelines provided a total of 59 comorbidity-related treatment recommendations (Table 3). Seventy-eight percent (46/59) of these recommendations addressed concordant comorbidities. Most of the diabetes mellitus type 2 guideline recommendations addressed concordant comorbidities such as coronary artery disease and heart failure. Relative to the other guidelines, the guidelines on depressive disorder included the largest proportion (33%) of recommendations on discordant comorbidities (such as cardiovascular disease). More than 90% of the recommendations were related to one comorbid condition; 10% focused on comorbidities in general and none of the recommendations specified the management of patients with more than one comorbid condition.

Fifty-four percent of the comorbidity-related recommendations concerned drug therapy (32/59); 25% related to other types of treatment such as psychotherapy or oxygen therapy (15/59). Few recommendations focused on surgery (10%; 6/59) and on life-style advice (3%; 2/59). Twelve percent of the recommendations (7/59) provided specific guidance on patient-centered aspects such as patient preferences, burden of disease and priority setting.

Table 3 – Characteristics of comorbidity-related treatment recommendations (N=59)

Comorbidity-related treatment recommendations	COPD	DEP	DM II	OA	TOTAL	%
	(N=4)	(N=9)	(N=44)	(N=2)	(N=59)	
	N	N	N	N	N	
<i>Type of comorbidity addressed</i>						
concordant comorbidity	3	5	38	0	46	78
discordant comorbidity	1	3	4	0	8	14
not specified	0	1	2	2	5	8
<i>Nr of comorbid conditions addressed</i>						
one comorbid condition	4	8	42	0	54	92
multiple comorbidities	0	0	0	0	0	0
not specified	0	1	2	2	5	8
<i>Type of recommendation</i>						
general treatment	0	3	1	0	4	7
drug therapy	1	4	27	0	32	54
life-style advice	0	0	1	1	2	3
surgery	0	0	5	1	6	10
other*	3	2	10	0	15	25
Includes patient centered aspects	0	3	4	0	7	12

COPD = Chronic Obstructive Pulmonary Disease; DEP = Major depressive disorder; DMII = Diabetes Mellitus type 2; OA = Osteoarthritis

* The category 'other' includes: psychological interventions, oxygen therapy, referral, assessment before flying, target levels, risk stratification

The link between guideline recommendation statements and the supporting evidence was described for 97% of the recommendations (57/59). The number of underlying studies varied between 1 and 12 per recommendation. The level of evidence of the studies was generally weak: 37% of the recommendations (22/59) had a ‘low’ level of evidence; for 25% of the recommendations (15/59) the level of evidence was described as ‘moderate’ (Table 4/ Box 1).

For 73% of the recommendations (43/59), the evidence underlying the studies was not adequately translated into the guideline with 48% (28/59) graded as ‘moderate’ and 25% (15/59) as ‘poor or unclear’ (Table 4/ Box 1). Translation of evidence was rated more frequently as ‘good’ for guidelines on diabetes mellitus type 2 (32% [14/44]) than those on depression (22% [2/9]); none of the guidelines on COPD and osteoarthritis received a ‘good’ rating for evidence translation (Table 4).

Table 4 – Evidence-base of comorbidity-related treatment recommendations (N=59)

Comorbidity-related treatment recommendations	COPD	DEP	DM II	OA	TOTAL	%
	(N =4)	(N=9)	(N=44)	(N=2)	(N=59)	
	N	N	N	N	N	
<i>Number of underlying studies</i>						
0 or unclear	1	1	7	1	10	17
1-2	3	4	12	0	19	32
3-4	0	3	11	0	14	24
>4	0	1	14	1	16	27
<i>Level of evidence of the studies</i>						
high	2	0	14	0	16	27
moderate	1	2	12	0	15	25
low	1	5	16	0	22	37
N.A.	0	2	2	2	6	10
<i>Translation of evidence</i>						
good	0	2	14	0	16	27
moderate	3	3	22	0	28	48
poor or unclear	1	4	8	2	15	25

COPD = Chronic Obstructive Pulmonary Disease; DEP = Major depressive disorder; DMII = Diabetes Mellitus type 2; OA = Osteoarthritis

Box 1 – Examples of comorbidity-related treatment recommendations with different levels of supporting evidence

Example of recommendation with moderate level of evidence and good translation of evidence

“Diabetic patients with acute myocardial infarction benefit from a tight glucometabolic control. This may be accomplished by different treatment strategies”

Level of evidence: MODERATE

Class IIa; Level B

Translation of evidence: GOOD

Metabolic support and control: There are several reasons why intensive metabolic control during an acute myocardial infarction should be of benefit [several studies are described ...]. Based on present knowledge, there is reasonable evidence to initiate glucose control by means of insulin infusion in diabetic patients who are admitted for AMIs with significantly elevated blood glucose levels in order to reach normoglycaemia as soon as possible. Patients admitted with relatively normal glucose levels may be handled with oral glucose-lowering agents. In the follow-up, both epidemiological data and recent trials support that continued strict glucose control is beneficial. The therapeutic regime to accomplish this goal may include diet, life styles strategies, oral agents, and insulin (see also section on life style and comprehensive management). Since there is no definite answer to which pharmacological treatment is the best choice, the final decision can be based on decisions by the physician-in-charge in collaboration with the patient. Most importantly, the effect on long-term glucose control has to be followed and the levels should be targeted to be as normal as possible. Several outcome studies with novel agents or regimens are ongoing and will report in the near future.

Comment:

Several studies are discussed directly targeting the group of diabetic patients with AMI. The strengths and limitations of the available evidence are clearly discussed and taken into consideration in making the final recommendation.

Example of recommendation with high level of evidence and moderate translation

“Prevent or treat osteoporosis (in patients with COPD)”

Level of evidence: HIGH

A

Translation of evidence: MODERATE

“Intervention should be targeted at men and women who are taking more than 15 mg daily of prednisolone or who have several risk factors for osteoporosis and whose BMD is < 1.5 standard deviations below the young adult mean (Ref 88). Oral bisphosphonates, particularly risedronate, have been shown to be effective in preventing and treating bone loss in men and women taking corticosteroids (Ref 88, 219). However, most patients in these studies did not have respiratory disease. Selecting patients with COPD who may be at increased risk of osteoporosis is most appropriately done on the basis of conventional risk factors. Further refining of clinical predictors and more evidence for the cost effectiveness of such programs still needs to be resolved before recommendations on a screening strategy in patients with COPD can be made. For more information on prevention and treatment of osteoporosis, see the current Australian guidelines.”

Comment:

Several studies and their limitations are described, but the studies are not directly focused on patients with respiratory diseases.

Example of recommendation with low level of evidence and good translation

“Treat depressed cardiac patients.....”

Level of evidence: Consensus statement = LOW

Translation of evidence: GOOD

“As yet there are no data to support the hypothesis that antidepressant treatment improves cardiac morbidity and mortality (Jiang, 2005 [R]). Nevertheless, consensus opinion is to treat depressed cardiac patients with a safe drug rather than watchful waiting since they would benefit from symptomatic relief of their depressive symptoms and there is a potential improvement in their cardiovascular risk profile (Ballenger, 2001 [R])”.

Comment:

The evidence (Ballenger JC, Davidson JRT, Lecrubier Y, et al. Consensus statement on depression, anxiety, and cardiovascular disease. *J Clin Psychiatry* 2001; 62:24-27) directly applies to the group of comorbid patients. Moreover, they discuss the strengths and limitations of the evidence and take these into account in formulating the recommendation.

Discussion

Patients with multiple comorbid conditions are frequently encountered in clinical practice. However, our results suggest that evidence-based guidelines on four relatively prevalent chronic diseases may have limited applicability to patients with comorbid conditions. Most of these guidelines do not provide explicit guidance on treatment of patients with specific combinations of diseases. If comorbidity is addressed in the guidelines, it is often discussed in general; few specific treatment recommendations for patients with comorbid conditions are provided, particularly for discordant combinations. Moreover, the evidence supporting the available comorbidity-related recommendations was generally limited, had moderate to poor quality, and was often not adequately translated into the guidelines.

Among the guidelines in our study that included specific comorbidity-related recommendations, these recommendations were more likely to focus on concordant comorbidities with related treatment plans. We also found that none of the comorbidity-related recommendations specified the preferred action for patients with more than one concurrent condition. These results are consistent with previous American¹⁶ and Australian²³ studies showing that guidelines pay little attention to

patients with discordant comorbidities and to patients with multiple chronic conditions. This lack of attention contributes to limiting the applicability of single disease guidelines on patients with chronic diseases as almost one third of them have three or more conditions ²⁴.

An important finding of our study is the limited evidence base that supports comorbidity-related recommendations. If specific recommendations for patients with comorbidity are provided, they are often based on limited evidence that is of moderate or poor quality. In addition, the supporting evidence rarely focuses directly on the groups of patients with comorbid conditions. Furthermore, the limitations of this evidence are not usually described in the guidelines. The failure to describe limitations of evidence in a guideline could give clinicians misplaced confidence in guideline recommendations.

Consistent with previous studies, our findings indicate that the evidence base for patients with multiple chronic conditions is limited ^{2, 3}. The lack of evidence specific to comorbid conditions may explain the limited attention to comorbidity in the guidelines we studied. If future clinical trials included patients with comorbid conditions, at least for the most common combination of diseases and report the results, this would provide the evidence base that clinical guideline developers need ^{16, 25}.

In light of the general absence of research evidence on patients with multiple conditions, guidelines should be more explicit about the applicability of their recommendations to patients with the most prevalent comorbid conditions and should discuss the quality and directness of the evidence for these patients. This explicit approach should replace the implicit assumption that guideline recommendations are applicable to patients with comorbid conditions unless conflicting evidence is available ^{26, 27}.

Our findings indicate that no systematic approach is used by guideline development groups for addressing comorbidity in guidelines. Compared to the guidelines on COPD, depressive disorder, and osteoarthritis, the guidelines on diabetes mellitus type

2 had better reporting of issues of comorbidity. Even for guidelines on the same condition, we found large variation between guidelines in the approach to addressing comorbidity. This applies to all levels of abstraction (guideline, recommendation, evidence). A previous study comparing diabetes guidelines from different countries, also found much variation in the supporting evidence, whereas the recommendations were similar²⁸. It would be helpful to develop guidance, as part of a handbook or manual for guideline developers^{29,30} to facilitate and support this process and to create more uniformity.

The main strength of our study is that we systematically assessed the content of an international sample of evidence-based national and international guidelines in terms of addressing comorbidity. The guidelines included in our study are among the best in the clinical areas of interest and were produced by prominent governmental agencies or professional organizations. Furthermore, by simultaneously assessing the underlying evidence of the comorbidity-related recommendations, we were able to determine whether guidance was provided on treatment of patients with comorbid conditions and also to what extent this guidance was based on high-quality evidence.

Our study has several limitations. First, a limited number of chronic conditions were included in our study. Inclusion of a different set of chronic conditions could have yielded different results. However, we do not expect guidelines on other diseases to be more applicable to patients with multiple conditions than those for the included common conditions. Second, the number of selected guidelines varied between the conditions, with an overrepresentation of diabetes guidelines. This reflects the available number of high-quality guidelines on the selected diseases in the databases. Third, we did not assess all available comorbidity related evidence for the included chronic conditions, but only the evidence that was described in the guidelines. A systematic search for evidence would be necessary to determine whether the guideline recommendations are based on the *best available* evidence. Future research on the selected conditions could be useful to draw firm conclusions on the availability of evidence for patients with multiple conditions, complementing the findings of our study.

Among a selected set of high-quality current evidence-based guidelines on prevalent chronic diseases, there is limited guidance on treatment of patients with comorbid conditions. Although the issue of comorbidity is recognized by guidelines, very few specific recommendations are provided and these are generally based on limited evidence of low or moderate quality. The supporting evidence often does not focus directly on groups of patients with comorbid conditions and it is rare that guidelines adequately describe the limitations of the evidence. Given the increasing prevalence of patients with multiple chronic diseases, guidelines should at least be explicit and transparent about the applicability of their recommendations to populations of patients with the most common combination of diseases. A guide for guideline developers could facilitate a systematic and uniform approach.

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Appendix 1: Classification of concordant and discordant comorbidities

COPD

Risk factors:

Smoking

Complications:

Pulmonary hypertension

Respiratory Failure

Conditions identified as concordant with COPD:

Cor pulmonale

Heart failure

Conditions identified as discordant with COPD:

Osteoporosis

Depressive disorder

Obesity

Unstable angina

Myocardial infarction

Arthritis

Atrium fibrillation

Depressive disorder (major)

Conditions identified as concordant with Depressive disorder:

Anxiety disorders

Bipolar disorders

Personality disorders

Substance abuse/dependence

Dementia

Chronic pain (syndrome)

Conditions identified as discordant with Depressive disorder:

Cardiovascular diseases

Diabetes

Parkinson's disease

Cancer

Diabetes mellitus type 2

Risk factors for diabetes/ atherosclerotic CVD:

Obesity
Hypercholesterolemia/ dyslipidaemia
Hypertension
Smoking

Complications:

Retinopathy
Nephropathy/ renal
disease/ chronic kidney
disease
Neuropathy
End/Organ damage
Gastroparesis

Conditions identified as concordant with Diabetes type 2:

Cardiovascular disease (CVD)

Coronary artery disease (CAD):

- Congestive heart failure
- Myocardial infarction (MI)
- Angina pectoris (AP)

Cerebral infarction

Transient ischaemic attack (TIA)

Peripheral arterial vascular disease

Aortic aneurysm abdominalis

Conditions identified as discordant with Diabetes type 2:

Chronic low back pain

Prostate cancer/ Benign prostatic hyperthrophy

Asthma

Depressive disorder

COPD

Gout

Atrium Fibrillation

Osteoarthritis

Risk factors:

Obesity

Conditions identified as concordant with Osteoarthritis:

Rheumatic arthritis

Low back pain

Conditions identified as discordant with Osteoarthritis:

Atherosclerotic cardiovascular diseases (including risk factors):

Ischaemic heart disease

Stroke

Congestive heart failure

Hypertension

Smoking

Hyperlipidaemia

Diabetes

Peripheral arterial disease

Chronic pain syndrome

Depressive disorder

A person wearing a white lab coat and high heels is walking on a paved path. They are carrying a large black bag filled with various medicine boxes. The bag is overflowing with boxes of different sizes and colors, including some labeled 'Retardon', 'Drog', 'Jaspaline 50', and 'Durolofon'. The person is walking away from the camera, and the background is a blurred outdoor setting with trees and a path.

Chapter 7

Perceived barriers to guideline adherence: a survey among general practitioners

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Submitted

Abstract

Background: Despite considerable efforts to promote and support guideline use, guideline adherence is often suboptimal. Barriers to adherence vary not only across guidelines but also across recommendations within guidelines. The aim of this study was to assess the perceived barriers to adherence among GPs by focusing on key recommendations within the guidelines.

Methods: We conducted a cross-sectional electronic survey among 703 GPs in the Netherlands. Sixteen key recommendations were derived from four national guidelines for general practice. Six statements were included to address the attitudes towards guidelines in general. In addition, GPs were asked to rate their perceived adherence (one statement) and the perceived barriers for each of the key recommendations, using 14 statements about barriers based on an existing framework.

Results: 264 GPs (38%) completed the questionnaire. Although 35% of the respondents reported difficulties in changing routines and habits in order to follow the guidelines, 89% believed that following the guidelines will lead to improved patient care. Reported levels of adherence varied between 52 and 95% across key recommendations (mean: 77%; SD: 15.0). Few respondents perceived barriers related to knowledge (mean: 9%; SD: 6.2). Among the barriers related to attitude, lack of applicability of the recommendations in general (22%; SD: 13.4) and more specifically to individual patients (25%; SD: 9) were perceived as most relevant. The most perceived barriers were related to external factors, in particular patient ability and behaviour (mean: 30%, SD: 9.5) and patient preferences (mean: 23%; SD: 15.4). The scores on perceived barriers differed largely between recommendations [minimum range on lack of evidence = 14%; maximum range on patient preferences = 67%].

Discussion: Dutch GPs have a positive attitude towards the NHG guidelines, report high adherence rates and low levels of perceived barriers. However, the perceived adherence and perceived barriers varied largely across the recommendations. The most perceived barriers across recommendations are patient related, suggesting that current guidelines do not always adequately incorporate patient preferences, needs and abilities. It may be useful to provide tools such as decision aids, supporting the flexible use of guidelines to individual patients in practice.

Background

Clinical practice guidelines aim to improve the quality of patient care by providing specific recommendations for daily practice. Despite the considerable efforts in developing and implementing evidence-based guidelines, only a modest impact has been found on clinical practice ¹⁻⁵. A comprehensive study in the US showed that only about half of the patients (55%) received recommended care as described in the guidelines ⁶. Similarly, in the Netherlands, general practitioners (GPs) do not optimally adhere to guidelines with adherence levels varying largely between practices and providers ⁷.

Many factors may influence the implementation of a guideline in practice. Barriers to guideline adherence can be related to the individual patient, the individual health care provider, the group of providers, the organisational context, and the social and cultural context of the healthcare system ⁸⁻¹⁰. An adequate analysis of the barriers that prevent healthcare providers from using guidelines in practice has demonstrated to be an important initial step in improving guideline adherence and, subsequently, quality of care ^{8,9}.

As different aspects of a guideline may provoke varying barriers, focusing on specific recommendations within guidelines may be useful in identifying barriers ¹¹. Several - predominantly qualitative studies - have focused on barriers at the level of key recommendations ¹¹⁻¹⁴. A focus group study among Dutch GPs showed that lack of applicability, organisational constraints, and lack of knowledge were the most prominent barriers to adherence to guidelines and that each individual key recommendation had a unique pattern of barriers ¹¹.

Most research studies focusing on barriers to specific recommendations in guidelines utilised qualitative studies with small samples (e.g. focus group studies); large quantitative studies are thus far lacking. This study complements the findings of a focus group study among Dutch GPs ¹¹. The aim of our study is to quantitatively assess the attitude of Dutch GPs towards guidelines and to assess the barriers

perceived in adhering to the key recommendations in guidelines. In addition, we explored the perceived adherence to key recommendations and hypothesised a reverse relationship between perceived adherence and perceived barriers.

Methods

Setting

In the Dutch healthcare system, the GP has a central role as a gate keeper to specialist and hospital care. Every Dutch citizen is obliged to register with a GP. More than 90% of all newly encountered health problems are being managed within general practice, contributing to efficient, low-cost healthcare services ¹⁵. Almost all GPs are members of the Dutch College of General Practitioners (NHG) ¹⁶, a body responsible for national guideline development and dissemination among their members. Currently, more than ninety guidelines have been developed and are updated regularly, covering the vast majority of acute and chronic conditions seen in general practice.

Study population

We conducted an electronic survey among all GPs in the South Western part of the Netherlands (N=703), using the mailing list of Stichting KOEL ¹⁷, a regional organisation supporting continuing medical education (CME) and practice management. After developing and pilot-testing the questionnaire, the final revision was sent to the GPs by an email linking to the electronic version of the questionnaire. They were offered one CME accreditation point (1 hour) for completing the questionnaire. A reminder was sent after two weeks and a second reminder after four weeks.

Questionnaire

Before developing the questionnaire, we conducted a qualitative focus group study to gain an understanding of all the potential barriers that GPs may perceive in adhering to guidelines ^{11, 14}. The barriers identified in the focus group discussions were classified in accordance to the framework of Cabana et al (1999) ¹⁰ (Table 1). In designing the

questionnaire, we used data from our focus group study in combination with an existing validated questionnaire to identify barriers to physician adherence to guidelines 18, 19.

In each questionnaire one out of four combinations of guidelines was included: 1. red eye (eye inflammation) and cerebrovascular accident (CVA); 2. red eye and urinary tract infections (UTI); 3. thyroid disorders and CVA; or 4. thyroid disorders and UTI. A total of sixteen key recommendations were derived from these four guidelines (varying between three to five per guideline) (Appendix 1). Three of these recommendations concerned diagnosis, nine were treatment recommendations, two concerned referral, and two focused on education or rehabilitation.

Each of the questionnaires consisted of two sections: a general and guideline specific part. The general section included questions about demographics and professional characteristics such as age, type of practice and number of hours worked weekly. In addition, six statements on attitudes towards NHG guidelines in general were included, based on the framework of Cabana ¹⁰. A 5-point Likert scale was used to rate the extent of agreement with the statements (ranging from 1. strongly disagree to 5. strongly agree).

The guideline specific section consisted of statements on barriers to guideline adherence for the key recommendations of the two specific guidelines. For each of the key recommendations fifteen statements about barriers to guideline adherence were included. One of these statements concerned knowledge of the recommendation, seven focused on barriers related to attitude, and seven on external barriers. In addition to the barrier statements, one statement concerned the extent that GPs adhere to the recommendation in practice ('I follow this recommendation in practice'). Each statement was rated on the same 5-point Likert scale. For the statements concerning external barriers the option 'not applicable' was added to the response scale (see Appendix A; p.229, for an example of the survey for the guideline on red eye).

Table 1 – Possible barriers to adhering to guideline recommendations in practice based on Cabana ¹⁰ and results from our focus groups study ¹¹

Knowledge related barriers	
<i>Lack of awareness/familiarity:</i>	GPs may be unaware of the (exact) content of the guideline recommendation
Attitude related barriers	
<i>Lack of agreement:</i>	GPs may disagree with the guideline recommendation due to perceived lack or inadequate interpretation of evidence or due to a lack of applicability of recommendations in general and more specifically to individual patients
<i>Lack of self-efficacy:</i>	GPs may believe that they cannot perform the guideline recommendation because they lack appropriate training or experience
<i>Lack of outcome expectancy:</i>	GPs may believe that even if they can perform the recommendation it will not affect patient outcomes
<i>Inertia of previous practice/ lack of motivation:</i>	GPs may not follow recommendations because of difficulties of changing habits or old routines or lack of motivation
External barriers	
<i>Patient factors:</i>	GPs may be unable to reconcile patient preferences and demands with guideline recommendations or believe that patients are unable to perform the necessary actions
<i>Guideline factors:</i>	GPs may believe that the guideline recommendations itself are unclear or ambiguous, incomplete, or too complex
<i>Environmental factors:</i>	GPs may be unable to overcome barriers in their practice environments, such as lack of time/time pressure, lack of resources/materials, organisational constraints within the own practice (e.g. arrangements with practice assistants), in other organisations (e.g. out of hours services, pharmacies) or between organisations (e.g. cooperation and arrangements with medical specialists) and lack of reimbursement

Analysis

Descriptive statistics were used to describe the demographic and professional characteristic of the GPs (mean, standard deviation, percentages). In our analysis of the responses to the statements on attitudes towards guidelines in general, we grouped the scores 4 and 5 (agree/ strongly agree), indicating agreement; the scores 3, indicating a neutral attitude, and the scores 1 and 2 (strongly/somewhat disagree), indicating disagreement.

Perceived adherence rates for each of the key recommendations were determined by combining the number of respondents that either agreed or strongly agreed (score 4 and 5) to follow the recommendations in practice. To determine perceived barriers, we first recoded the barrier statements that were positively formulated, so that a higher score indicated a higher level of perceived barriers. Perceived barriers for each of the key recommendations were then calculated by combining the number of respondents that either agreed or strongly agreed (score 4 and 5) that a barrier was applicable.

To determine the association between perceived adherence and perceived barriers, we first calculated the mean percentage of respondents that agreed that barriers were applicable for knowledge related barriers, attitude related barriers, external barriers, and all barriers. Next, we calculated the Pearson Correlation between perceived adherence and each of the main categories of barriers and the total of all barriers.

Results

We received 264 completed questionnaires, resulting in a response rate of 38% (264/703). The questionnaires distributed to the GPs yielded the following response for the four guidelines: 122 on red eye; 129 on thyroid disorder; 120 on CVA and 120 on UTI.

Characteristics of GP sample

Table 2 summarises the demographic and professional characteristics of the responding GPs. The majority of respondents were male (62%), most were aged between 55 and 64 years (37%), worked as independent GPs (80%), and worked in solo practices (37%). Comparing to the total population of Dutch GPs²⁰, GPs in the age group of 55-64 years were somewhat overrepresented in our sample.

Table 2 - Demographic and professional characteristics of the responding GPs (n=264)

	N	%*	Mean (SD)	Total population of Dutch GPs& (%)
Sex				
Male	165	62.5		61.9
Female	99	37.5		38.1
Age			50.4 (8.9)	-
<35	13	4.9		7.3
35-44	49	18.5		28.7
45-54	75	28.3		36.4
55-64	97	36.6		27.2
>65	2	0.8		0.5
Type of practice ⁺				
Solo	97	36.6		41.8
Partnered	85	32.1		31.3
Group	79	29.8		26.9
Type of physician ⁺				
Independent	212	80.0		88.7
GP working for other GP	30	11.3		11.3
Observer	10	3.8		-
Other	13	4.9		-
Years working as GP				
<3	9	3.4		-
3-7	33	12.5		-
7-10	21	7.9		-
>10	198	74.7		-

* Percentages may not add up to 100 due to missing variables

& Only includes independent GPs and GPs working for other GPs (8789 GPs: independent: 7799; GPs working for other GPs: 990).

⁺ More than one answer possible

General attitude towards guidelines

Almost all respondents (97%) agreed to the statement that NHG guidelines are useful sources of advice (Figure 1). In addition, 94% reported that they believed that NHG guidelines are based on sound and sufficient evidence.

Thirty-five percent of the GPs agreed to have difficulties changing their routines and habits in order to follow the NHG-guidelines. In addition, 14% of the GPs indicated

that their lack of knowledge and/or certain skills complicates working in accordance to the NHG guidelines.

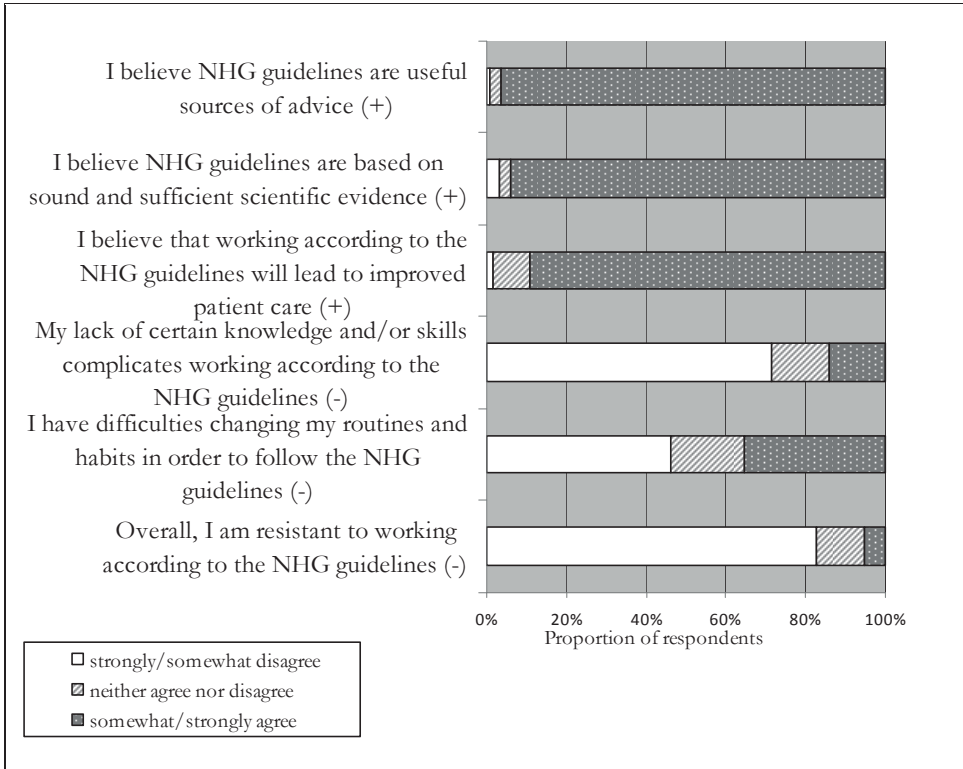


Figure 1 – GPs ratings on statements measuring the attitude towards NHG guidelines in general (n=260) General attitude was measured by three positively formulated statements (+) and three negatively formulated statements (-)

Perceived adherence

The mean perceived adherence rate across recommendations was 77% [SD: 15]. The guideline on red eye received the highest adherence rate (M=83%; SD: 3.0); the guideline on CVA/stroke the lowest (M=69%; SD: 15.2) (see Appendix 2 for scores on each of the key recommendations).

Recommendations on referral showed the highest rates of adherence (M=94%; SD: 2.1), whereas recommendations on education or rehabilitation received the lowest rates

of adherence (M=57%; SD: 7.3). Recommendations on both diagnosing and treatment had intermediate rates of adherence (respectively 78%; SD: 12.8 and 77%; SD: 14.2). Reported levels of adherence varied between 50 and 95% across the sixteen key recommendations. High levels of adherence were found for the key recommendations referral thyroid node (KR11; 95%) and treatment of thyroid hypo function (KR9; 94%). The recommendation on treatment of thyroid hyper function (KR10; 50%) and on education in CVA/stroke (KR8; 52%) received the lowest percentages of perceived adherence.

Perceived barriers and association with adherence

Table 3 summarises the percentage of respondents that agrees that specific barriers apply to specific recommendations. Overall, the mean percentage of GPs that agreed that barriers were applicable to the key recommendations varied from 4% (SD: 5.1) on lack of reimbursement to 30% (SD: 9.5) on patient ability and behaviour.

Barriers related to knowledge received low scores with an average of 9% of the GPs perceiving lack of awareness/ familiarity with the guideline recommendations as a barrier across the sixteen key recommendations (SD: 6.2). Among the barriers related to attitude, lack of applicability of the guideline in general (M=22%; SD= 13.4) and more specifically to individual patients (M=25%; SD: 9.1) had the highest score. The most perceived barriers were related to external factors, in particular patient ability and behaviour (M= 30%, SD: 9.5) and patient preferences (M=23%; SD: 15.4). Lack of resources/ materials and lack of reimbursement showed the lowest scores (M=6%; SD: 7.4; and M=4%; SD: 5.1 respectively).

Table 3 – Mean percentage of GPs that (strongly) agree to perceive barriers in adhering to sixteen key recommendations from four guidelines

	Mean (%)	SD	Range	(min, max)
Knowledge related barriers				
<i>Lack of awareness/familiarity</i>	9.0	6.2	20.3	(1.7-22.0)
Attitude related barriers				
<i>Lack of agreement</i>				
Lack of evidence	12.2	3.8	13.6	(5.1-18.7)
Lack of applicability general	22.4	13.4	42.5	(5.0-47.5)
Lack of applicability to individual patients	25.2	9.1	34.9	(11.0-45.9)
<i>Lack of self-efficacy</i>	10.8	13.0	49.6	(0.0-49.6)
<i>Lack of outcome expectancy</i>	9.6	5.3	17.7	(1.7-19.4)
<i>Inertia of previous practice/ lack of motivation</i>	16.9	7.5	25.8	(3.9-29.7)
External barriers				
<i>Patient factors</i>				
Patient preferences/ demands	23.0	15.4	67.4	(8.8-76.2)
Patient ability and behaviour	29.7	9.5	33.6	(11.7-45.3)
<i>Guideline factors</i>				
Guideline recommendation factors	12.1	6.2	20.5	(2.4-22.9)
<i>Environmental factors</i>				
Lack of time/ time pressure	12.7	14.1	51.7	(0.8-52.5)
Lack of resources/ materials	6.1	7.4	23.3	(0.8-24.1)
Organisational constraints	13.9	9.1	30.1	(4.4-34.5)
Lack of reimbursement	3.8	5.1	15.2	(0.0-15.2)

The scores on perceived barriers differed largely between recommendations (see Appendix 2 for scores on each of the key recommendations and see Box 1 for examples of key recommendations and their specific barriers). The smallest range across recommendations was found for the barrier lack of evidence (14%) and the largest one for patient preferences (67%). Some barriers were widely applicable across recommendations (patient ability and behaviour, patient preferences, lack of applicability in general and to individual patients), whereas others received high scores for some recommendations only (lack of self-efficacy, inertia of previous practice /lack of motivation, guideline recommendation factors, lack of time/time pressure, lack of resources/materials, and organisational constraints). Other barriers received low scores across all recommendations (lack of awareness/familiarity with the recommendation, lack of outcome expectancy, lack of reimbursement).

Adherence was negatively associated with the overall perceived barriers (-.82**). The strongest relation was found for attitude related barriers (-.86**), followed by external barriers (-.68**) and knowledge related barriers (-.67**).

Box 1– Examples of key recommendation and their perceived barriers to adherence**Key recommendation 2 (Red eye):**

Patients with a diffuse red eye, no itching, no alarming symptoms (pain, vision impairment, or photophobia), and no abnormalities of the cornea, have a likely diagnosis of infectious conjunctivitis. If the symptoms last shorter than 3 days or do not cause much discomfort, antibiotics are not necessary and a 'wait-and-see' strategy could be considered.

Most perceived barriers (>35%):

- Patient preferences (76%)
- Lack of applicability to patients (46%)
- Patient ability and behaviour (39%)

Explanation:

GPs may believe that the guideline recommendation is difficult to reconcile with patient preferences and demands, as patients often prefer, expect or demand antibiotics and do not rely on a 'wait-and-see' policy. In relation to this, GPs may believe that the recommendation is difficult to apply in practice as it does not consider unique characteristics of patients or specific patient groups.

Key recommendation 8 (CVA):

In the chronic phase of CVA (i.e. when no further improvements are to be expected) the GP provides information to the patients and their central caregivers with an emphasis on practical information that can contribute to a meaningful and satisfying daily life. They are also informed about activities of patient associations, peer groups, partner contacts, and educational meetings.

Most perceived barriers (>35%):

- Lack of time/time pressure (53%)
- Lack of applicability general (48%)
- Patient ability and behaviour (45%)
- Organisational constraints (35%)

Explanation:

GPs may believe that adhering to this recommendation is difficult due to additional work demands compared to regular care. Therefore, they may think it is difficult to apply in practice. They may also believe that patients are unable to comply with the necessary actions. Furthermore, organisational constraints such as lack of trained personnel or coordination with the activities performed by other healthcare providers (e.g. specialists in hospitals) make it difficult to apply the recommendation in practice.

Key recommendation 10 (Thyroid disorder):

If the GP has specific knowledge on thyroid disorders, patients with hyperthyroid (Graves disease) could be treated using the 'combination method'. This includes full inhibition of the thyroid function with a thyreostatic (preferably thiamazole 1dd30 mg), and then providing levothyroxine. Discuss the pros and cons of the treatment options (medication, radioactive iodine, surgery) with the patient and involve him or her in decision making.

Most perceived barriers (>35%):

- Lack of self-efficacy (50%)
- Lack of applicability (44%)

Explanation:

GPs may not feel confident with performing the recommendation in practice, as they lack appropriate training or experience to treating patients with hyperthyroid. In relation to this, they may think that the recommendation is difficult to apply in practice.

Discussion

This study illustrated that Dutch GPs have a highly positive attitude towards the national guidelines for general practice. In addition, they reported high rates of adherence to the recommendations and the perceived barriers were overall limited. However, rates of adherence and barriers differed substantially across recommendations, resulting in varying patterns of adherence rates and barriers for different key recommendations. The most perceived barriers – which are widely applicable across recommendations - are patient related, suggesting that GPs believe that current guidelines do not always adequately incorporate patient preferences, needs and abilities.

GPs in our study were very positive towards the NHG guidelines in general. Other studies focusing on physicians' attitudes towards guidelines in general ^{21, 22} and in particular those of GPs ^{23, 24}, demonstrated overall positive attitudes as well. Moreover, the highly positive attitude found among our sample of Dutch GPs may be related to the fact that almost all GPs are a member of the NHG and that the NHG guidelines are presented as 'guidelines for GPs developed by GPs'. This can result in a strong sense of ownership among the target group. Although the overall adherence rate reported by GPs was rather high, we further uncovered that the rates of adherence varied largely across recommendations. These findings are consistent with a comprehensive study based on data from medical records among 195 GPs working in 104 general practices in the Netherlands, showing that GPs overall adherence is about 74%, with levels of adherence varying largely between diagnoses ⁷. The overall positive attitude towards NHG guidelines, but varying levels of adherence across recommendations, indicate that barriers should certainly be identified at the level of the individual recommendations.

In line with the overall positive attitude to guidelines and high rate of adherence, the reported barriers among our GPs were overall limited. Furthermore, we found a negative association between perceived adherence and all types of barriers; recommendations that were more adhered to in practice, received lower rates on

barriers. We found that barriers related to knowledge were not perceived as a barrier, whereas some of the barriers related to attitude and external factors prevented GPs from applying recommendations consistently in practice. The most perceived barriers to adherence across key recommendations were patient ability and behaviour, patient preferences and lack of applicability in general and more specifically to individual patients. These findings suggest that GPs believe that preferences, abilities and needs of individual patients are not well incorporated in guidelines that focus on the ‘average patient’, complicating adherence to guideline recommendations in practice.

Other studies also indicated that lack of applicability can be a barrier to guideline adherence, particularly to patients with comorbidity ^{11, 25}. That guidelines do in fact provide little guidance on the treatment of patients with comorbidities was confirmed in several studies ^{26, 27}. Aside from comorbidities, generally, GPs can have difficulties balancing the needs of the individual patients with the aggregated needs of the population and deviate from guidelines by adjusting practice to the patients’ individual needs ²⁴. To address these main barriers, it may not only be useful to involve patients in the guideline development ²⁸⁻³⁰, but also to adapt the guidelines to facilitate the integration of individual patients’ preferences in clinical decision making ³¹. In addition, it may be useful to provide tools such as decision aids to support the flexible use of guidelines to individual patients in practice.

Although lack of knowledge regarding guideline recommendations was mentioned as a barrier in the focus group study ¹¹, it was not identified as a barrier in this study. Discrepancies between qualitative and quantitative studies have been found before and may be related to the superficial nature of a survey compared to the more problem-oriented focus in qualitative studies ²⁴. On the other hand, the aim of the focus group study was to identify the range of barriers, whereas the survey aimed to explore the relevance of the barriers among a larger sample of the target group. Other barriers that did not seem to be relevant across all recommendations were lack of evidence and lack of outcome expectancy, which is in line with the overall positive attitude of Dutch GPs towards NHG guidelines. Dutch GPs seem to value the NHG guidelines and do not question their scientific basis and content. Finally, lack of reimbursement was among

the lowest scoring barriers. This may be related to the well-recognised role of GPs and appropriate financial structure within the Dutch healthcare system ^{32, 33}.

Some limitations of our study need to be mentioned. Although our response rate is only a little bit below mean response rates of surveys among physicians ^{34, 35}, it may nevertheless limit the ability to generalize our findings. Those with a positive attitude towards guidelines may be overrepresented in our sample. To minimise this possible bias, we offered accreditation points for completing the questionnaire, creating an incentive to participate for all GPs. Secondly, perceived barriers depend on GPs' perceptions of the situation and may not accurately reflect the - whole spectrum of - barriers. Similarly, perceived adherence rates may be subject to the phenomenon of social desirability, resulting in overestimations of adherence rates ³⁶. On the other hand, there are indications that self-reporting among physicians is a valid and reliable source for assessing clinical performance, with high levels of consistency with data from medical records ³⁷.

Thirdly, we used an existing framework to classify the barriers. Whereas the use of a predefined framework is useful in analysing a wide range of barriers, the classification of barriers can also be disputed. Based on our qualitative focus group study ¹¹ we suggest that lack of applicability should be a more prominent category, including different reasons such as patients with comorbidities and that patient factors should also include patients' abilities, needs and behaviour, rather than solely their preferences. Fourthly, our analysis of barriers is based on four guidelines, while GPs in the Netherlands currently have more than 90 guidelines at their disposal. The inclusion of other guidelines potentially could have yielded different patterns of barriers. As a diverse set of recommendations of both acute and chronic conditions were included, we expect the identified barriers to be quite representative across all guidelines in general practice.

Results from our study emphasise that it is useful to focus on key recommendations when analysing barriers. Although the ratings of barriers were generally low, we found a large variation in barriers across key recommendations within the guidelines, resulting in unique patterns of barriers for key recommendations. Whereas an intervention that attempts to address the barriers for all recommendations of guidelines is usually not feasible, results from our detailed analysis of barriers may help in designing interventions to improve guideline adherence and decisions on where to focus efforts. In addition, substantial improvements can be achieved by focusing on barriers that are widely applicable across recommendations, such as the patient related barriers as mentioned above.

In conclusion, Dutch GPs are highly positive about NHG guidelines in general, report overall high adherence rates and low rates of perceived barriers. Most key recommendations, however, have specific combination of barriers that need to be addressed to improve guideline adherence. GPs in our study emphasised barriers that were patient related, indicating that the insufficient incorporation of patients' preferences, abilities and needs, complicates adhering to guideline recommendations in practice. Aside from tailoring interventions to specific barriers of each key recommendation, substantial improvements can be achieved by focusing on these widely applicable barriers.

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Appendix 1: Key recommendations of guidelines (Dutch)

Guideline 1 Eye Inflammation ('Red eye')/ Het rode oog (M57; 2006)

Kernaanbeveling 1:

Bij een rood oog gepaard gaande met pijn, daling van het gezichtsvermogen of lichtschuwheid (indien niet veroorzaakt door keratoconjunctivitis fotoelectrica, corpus alienum of ander trauma), wordt de visus bepaald, de pupillen en pupilreacties beoordeeld en nader onderzoek van de cornea verricht met behulp van fluoresceïnekleuring.

Kernaanbeveling 2:

Bij diffuse roodheid en afwezigheid van jeuk, alarmsymptomen (pijn, visusdaling of lichtschuwheid) en cornea-afwijkingen, is er waarschijnlijk sprake van een infectieuze conjunctivitis. Indien de klachten korter dan drie dagen duren of er bestaat niet veel hinder, kan worden afgewacht zonder antibiotische behandeling.

Kernaanbeveling 3:

Als bij een (vermoedelijk) bacteriële conjunctivitis (diffuse roodheid, 's ochtends dichtgeplakte ogen en afwezigheid van jeuk, alarmsymptomen en cornea-afwijkingen) wordt besloten tot antibiotische behandeling, gaat de voorkeur uit naar chlooramfenicol oogzalf 1% 2-4 dd. Bij een blefaritis kan ook fusidinezuur worden voorgeschreven, in andere gevallen van conjunctivitis is dit middel niet zinvol gezien de resistentieontwikkeling.

Guideline 2 Cerebrovascular accident / CVA (M81; 2004)

Kernaanbeveling 4:

Patiënten met een CVA (acute neurologische uitvalsverschijnselen, zich uitend in verlamming van ledematen of gelaat, spraakstoornissen, of anderszins) worden op korte termijn verwezen voor opname op een *stroke-unit*, tenzij de uitvalsverschijnselen slechts gering van omvang zijn of spontaan al sterk verbeteren.

Kernaanbeveling 5:

Bij patiënten met een CVA die thuisblijven omdat de uitvalsverschijnselen spontaan sterk verbeteren, wordt een cardiovasculair risicoprofiel opgesteld (zie NHG-Standaard Cardiovasculair risicomangement). Tevens wordt direct gestart met acetylsalicylzuur 1dd 160 mg gedurende twee weken, waarna de dosering wordt verlaagd naar 1dd 80 mg.

Kernaanbeveling 6:

Bij patiënten met een CVA die thuisblijven omdat de uitvalsverschijnselen spontaan sterk verbeteren, wordt het voorschrijven van bloeddrukverlagende medicatie onmiddellijk na het CVA afgeraden. Het is beter daar twee weken mee te wachten tot de patiënt klinisch stabiel is.

Kernaanbeveling 7:

Bij patiënten met een CVA die thuisblijven, draagt de huisarts zorg voor een spoedige start van de revalidatie - in een verpleeghuis (dagbehandeling), revalidatiecentrum of thuis - en periodieke evaluatie van het beloop en de behoefte aan zorg.

Kernaanbeveling 8:

Ook in de chronische fase (d.w.z. als er geen verbetering meer te verwachten is) geeft de huisarts voorlichting aan patiënten met een CVA en hun centrale verzorgers met het accent op praktische informatie die kan bijdragen aan een zinvolle en bevredigende dagbesteding. Ook worden zij geattendeerd op activiteiten van de patiëntenvereniging zoals lotgenotencontacten, partnercontacten en voorlichtingsbijeenkomsten.

Guideline 3 Thyroid disorder/ Schildklierandoeningen (M31; 2006)

Kernaanbeveling 9:

Streef bij de behandeling van een patiënt met hypothyreoïdie naar een normale TSH-waarde en stel de medicatie (met levothyroxine) verder bij op grond van klachten. Spreek in de instelfase, niet eerder dan zes weken na de laatste doseringsverandering, een laboratoriumcontrole (TSH en vrij T4) af. In het eerste jaar nadat de patiënt klachtenvrij is geworden en het TSH en vrije T4 door medicatie zijn genormaliseerd, vinden de controles elke drie maanden plaats. Spreek vervolgens een jaarlijkse controle af, levenslang.

Kernaanbeveling 10:

Indien de huisarts specifieke kennis heeft van schildklierandoeningen kan een patiënt met hyperthyreoïdie (ziekte van Graves) door de huisarts medicamenteus worden behandeld via de combinatiemethode. Hierbij wordt de schildklier eerst volledig stilgelegd met een thyreostaticum (bij voorkeur thiamazol 1dd30 mg), waarna levothyroxine wordt bijgegeven. Bespreek de voor- en nadelen van de verschillende behandelopties (medicamenteus, radioactief jodium, chirurgie) met de patiënt en betrek hem of haar bij de besluitvorming.

Kernaanbeveling 11:

De huisarts verwijst patiënten met een solitaire nodus of met een dominante nodus in een multinodulair struma naar een internist voor aanvullende diagnostiek.

Guideline 4 Urinary Tract Infections/ Urineweginfectie (M05; 2005)

Kernaanbeveling 12:

Het urineonderzoek bij klinische verdenking op urineweginfecties bestaat in eerste instantie uit een nitriettest, waarna bij een negatieve uitslag een dipslide wordt ingezet.

Kernaanbeveling 13:

Ongecompliceerde urineweginfecties, d.w.z. urineweginfecties bij niet-zwangere, overigens gezonde vrouwen, dienen in eerste instantie behandeld te worden met nitrofurantoïne. Bij overgevoeligheid voor nitrofurantoïne wordt trimethoprim geadviseerd.

Kernaanbeveling 14:

Bij een gecompliceerde urineweginfectie, d.w.z. bij tekenen van weefselinvasie (koorts, rillingen, algemeen ziek-zijn, flank- of perineumpijn) of urineweginfectie bij patiënten uit een risicogroep (mannen, zwangere vrouwen, personen jonger dan 12 jaar, patiënten met afwijkingen aan de nieren of urinewegen in de voorgeschiedenis (zoals ernstige nierinsufficiëntie, cystennieren, nierstenen, een neurogene blaas of bemoeilijkte mictie), patiënten met een verminderde weerstand (zoals tgv. bestraling, immunosuppressiva of diabetes mellitus), patiënten met een verblijfskatheter) dient voorafgaand aan de behandeling urine te worden verzameld voor kweek en resistentiebepaling.

Kernaanbeveling 15:

Bij een gecompliceerde urineweginfectie dienen patiënten met tekenen van weefselinvasie, evenals alle jongens tot 12 jaar, meisjes tot en met 4 jaar en daarnaast patiënten met aandoeningen van de nieren of urinewegen, een verminderde weerstand (m.u.v. diabetes) of een verblijfskatheter, gedurende 10 dagen te worden behandeld met amoxicilline/ clavulaanzuur, totdat de uitslag van de kweek en resistentiebepaling bekend is. Bij overgevoeligheid dient dit te worden vervangen door co-trimoxazol of een fluorochinolon (norfloxacin 2dd400 mg of ciprofloxacine 2dd500 mg, maar niet in de zwangerschap of tijdens lactatie of bij leeftijd < 16 jaar).

Kernaanbeveling 16:

Bij een gecompliceerde urineweginfectie bij patiënten zonder tekenen van weefselinvasie dienen mannen, zwangeren, meisjes van 5-12 jaar en diabetes gedurende 7 dagen te worden behandeld met nitrofurantoïne totdat de uitslag van de kweek en resistentiebepaling bekend is. Bij overgevoeligheid voor nitrofurantoïne wordt gekozen voor 7 dagen trimethoprim.

Appendix 2 – Percentage of GPs that (strongly) agree to adhere to key recommendations in practice and that barriers are applicable to key recommendations from four guidelines

	Adherence	Attitude related barriers							
		Knowledge related barriers		Lack of agreement		Lack of self-efficacy		Inertia / lack of motivation	
		Lack of awareness/familiarity	Lack of applicability : general	Lack of applicability : to patient	Lack of self-efficacy	Lack of outcome expectancy	Inertia / lack of motivation		
Guideline Red eye (n=122)	82.9	7.0	12.0	17.1	25.9	2.6	11.7	18.2	
KR 1: diagnosis	85.0	11.0	9.1	11.8	14.2	5.5	7.9	15.7	
KR 2: no antibiotics	79.5	5.8	13.5	31.2	45.9	2.4	13.9	19.7	
KR3: preferred antibiotic	84.2	4.2	13.3	8.3	17.5	0.0	13.4	19.2	
Guideline CVA/Stroke (n=120)	68.3	14.7	12.8	30.0	27.8	12.7	9.7	16.6	
KR4: refer to stroke unit	92.4	3.3	13.0	18.5	31.1	3.4	9.3	7.6	
KR5: risk profile and aspirin	64.1	16.1	18.7	14.6	33.3	6.9	17.1	16.2	
KR6: no blood pressure lowering drugs	71.2	17.0	9.7	12.7	19.5	5.9	7.6	10.1	
KR7: rehabilitation	61.9	15.2	11.9	41.5	28.8	13.5	7.6	19.5	
KR8: education	51.7	22.0	10.6	47.5	26.3	33.9	6.7	29.7	
Guideline Thyroid disorder (n=129)	79.6	5.4	7.5	21.4	15.9	21.4	9.0	13.6	
KR9: treatment thyroid hypo function	94.0	6.0	7.6	12.1	19.6	4.5	3.8	12.1	
KR10: treatment thyroid hyper function	49.6	7.0	9.8	43.5	17.2	49.6	19.4	24.8	
KR11: referral thyroid node	95.3	3.2	5.1	8.6	11.0	10.1	3.9	3.9	
Guideline UTI (n=120)	80.0	6.6	14.6	18.7	27.6	7.5	8.7	18.4	
KR12: diagnosis uncomplicated UTI	63.3	5.8	16.7	28.4	34.2	6.7	17.6	29.4	
KR13: treatment uncomplicated UTI	90.0	1.7	14.6	5.0	33.4	1.6	9.2	6.7	
KR14: diagnosis complicated UTI	85.8	6.6	15.4	26.7	26.7	5.8	4.2	17.5	
KR15: treatment complicated UTI with tissue invasion	88.3	4.1	9.2	15.0	19.2	8.3	1.7	19.2	
KR16: treatment complicated UTI without tissue invasion	72.5	15.0	17.1	18.3	24.2	15.0	10.8	19.2	
All 16 KRs (mean %)	76.8	9.0	12.2	22.4	25.2	10.8	9.6	16.9	
(SD)	(15.0)	(6.2)	(3.75)	(13.4)	(9.1)	(13.0)	(5.3)	(7.5)	

Appendix 2 – Percentage of GPs that (strongly) agree to adhere to key recommendations in practice and that barriers are applicable to key recommendations from four guidelines

		External barriers						
		Patient factors		Guideline factors		Environmental factors		
		Patient preferences	Patient ability /behaviour	Guideline recommendation factors	Lack of time/ pressure	Lack of resources/ materials	Organisational constraints	Lack of reimbursement
Guideline Red eye	(n=122)	36.4	33.4	7.2	10.5	6.4	7.9	1.1
KR 1: diagnosis		8.8	26.7	6.6	18.5	15.3	5.9	3.2
KR 2: no antibiotics		76.2	39.3	8.5	12.3	3.2	13.4	0.0
KR3: preferred antibiotic		24.1	34.2	6.4	0.8	0.8	4.4	0.0
Guideline CVA/Stroke	(n=120)	22.7	34.1	15.4	20.8	6.4	22.8	6.1
KR4: refer to stroke unit		24.3	25.2	12.1	2.5	0.8	13.5	0.8
KR5: risk profile and aspirin		23.0	30.7	14.1	9.4	0.9	16.3	0.9
KR6: no blood pressure lowering drugs		20.3	24.5	7.6	4.2	2.5	15.3	3.4
KR7: rehabilitation		28.8	44.9	20.3	35.6	7.6	34.5	10.2
KR8: education		17.0	45.3	22.9	52.5	20.3	34.5	15.2
Guideline Thyroid disorder	(n=129)	15.7	25.5	9.1	8.8	3.4	9.8	1.1
KR9: treatment thyroid hypo function		18.3	32.9	5.8	4.6	2.3	6.1	0.0
KR10: treatment thyroid hyper function		17.8	31.8	19.2	18.6	3.9	17.1	2.4
KR11: referral thyroid node		10.9	11.7	2.4	3.1	3.9	6.2	0.8
Guideline UTI	(n=120)	19.5	25.5	13.4	8.2	7.1	11.2	4.8
KR12: diagnosis uncomplicated UTI		30.0	25.0	20.3	14.2	24.1	16.3	15.0
KR13: treatment uncomplicated UTI		20.0	22.5	7.8	1.7	0.8	6.1	1.6
KR14: diagnosis complicated UTI		20.8	39.1	15.6	18.3	8.3	14.2	4.2
KR15: treatment complicated UTI with tissue invasion		15.0	24.2	9.7	1.6	1.6	10.8	2.5
KR16: treatment complicated UTI without tissue invasion		11.7	16.7	13.6	5.0	0.8	8.6	0.8
All 16 KR	(mean %)	23.0	29.7	12.1	12.7	6.1	13.9	3.8
	(SD)	(15.4)	(9.5)	(6.2)	(14.1)	(7.4)	(9.1)	(5.1)

A person wearing a patterned dress and white high heels is walking on a paved path. They are carrying a large black bag filled with various medicine boxes, including brands like 'Droperidone', 'Droperidone 2mg', and 'Josacoline 50'. The scene is captured in a high-angle, slightly blurred perspective, suggesting movement.

Chapter 8

General practitioners' preferences for interventions to improve guideline adherence

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Submitted

Abstract

Background: Implementation of guidelines among general practitioners (GPs) appears to be complex. Although it is recognised that interventions aimed at improving guideline adherence should take into account the specific features of the target group, it is unclear how GPs evaluate the different types of interventions. The aim of this study was to identify GPs' preferences for interventions to improve guideline adherence and to determine whether these differ across key recommendations in guidelines.

Methods: An electronic survey was conducted among 703 GPs working in the Netherlands. Each survey focused on two out of four guidelines: cerebrovascular accident (CVA), eye inflammation (red eye), thyroid disorders and urinary tract infection (UTI). GPs were asked to rate potential interventions in terms of their usefulness in improving guideline adherence in general and for specific key recommendations in guidelines. The interventions were classified according to the taxonomy of the Cochrane Effective Practice and Organisation of Care Group (EPOC).

Results: 264 GPs (38%) completed the questionnaire. As methods for improving guideline adherence in general, GPs preferred interactive small group meetings (84% rated this as much or very much encouraging), audit and feedback (53%), organisational interventions (50%), and the use of local opinion leaders (50%). Financial interventions (24%), the mere distribution of educational materials (22%), as well as big group educational meetings (21%) were of least interest to the GPs. In addition, some interventions were preferred by GPs irrespective of the specific key recommendations (e.g. educational meetings, audit and feedback), while ratings for other strategies differed more across key recommendations (e.g. reminders/computer support, patient mediated strategies and certain organisational interventions).

Conclusions: To implement guidelines, interventions need to be identified that are acceptable and appealing to the target group. As GPs seem to have general and recommendation-specific preferences regarding interventions, it may be useful to take these into account when developing plans for guideline implementation to encourage the uptake of guidelines in daily practice.

Background

Guidelines aim to improve the quality of care, but their implementation in practice remains a challenge ¹⁻⁵. Despite the many efforts to promote guideline use, Dutch general practitioners' (GPs) adherence to guidelines is not optimal with large variations between practices ⁶. A recently conducted focus group study showed that lack of applicability, organisational constraints and lack of knowledge were perceived as barriers to the implementation of guidelines among Dutch GPs ⁷. A quantitative study among Dutch GPs confirmed the importance of lack of applicability as a barrier and found that patient factors were also widely perceived as barriers to guideline implementation ⁸.

Implementation of guidelines can be defined as 'a stepwise and planned introduction of a guideline, aiming to integrate its recommendations into routine practice of healthcare professionals' ⁹. Several types of interventions have been proposed to facilitate guideline use. These include interventions oriented towards health professionals (e.g. educational conferences, reminders), financial interventions (e.g. patient incentives), organisational interventions (e.g. changes in the practice setting), and regulatory interventions (e.g. changes by law) ¹⁰⁻¹².

Research studies on the effectiveness of different interventions have shown that none of the strategies is superior in all situations; most are useful in some settings ^{13, 14}. It is well known that dissemination of guidelines only is not enough and that more proactive strategies are typically needed to improve guideline adherence ¹⁵⁻¹⁸. Multifaceted interventions, however, do not always yield more effect than single ones ^{19, 20}. Additionally, it is recognised that interventions should be tailored to the specific barriers to guideline adherence and other features of the target group and setting ^{13, 21, 22}.

Whereas the process of identifying barriers to guideline adherence has been documented extensively ^{7, 23}, relatively little is known about methods to translate the identified barriers and other features of the target group into specific interventions ¹⁰.

The choice of an intervention in practice is often based on personal preferences of the researchers or familiarity with specific types of interventions ^{21, 24}, rather than on the outcomes of a systematic analysis of barriers ²⁵. Moreover, the target users are usually not involved in selecting interventions to improve adherence ²⁶.

As acceptance and local support are essential in initiating behaviour change in professionals ^{27, 28}, preferences of the target group may be important in determining the success of an intervention and thus increase guideline use ²⁹. The aim of this study was to identify GPs' preferences for interventions to improve guideline adherence in practice and to determine whether these preferences differed across key recommendations in guidelines.

Methods

Study design and population

We conducted a cross-sectional survey among all GPs in the South Western part of the Netherlands, including the city of Rotterdam (N=703). The database of Stichting KOEL ³⁰, a foundation responsible for continuing medical education (CME) for GPs in this part of the Netherlands, was used to obtain contact details of the GPs. All GPs in the database were sent an email with a link to the questionnaire. An alternative to the electronic version of the questionnaire was a hard copy which was available on request. Completing the questionnaire was rewarded with one CME accreditation point (1 hour). Two weeks after the initial mailing, a reminder was sent with a second reminder sent after four weeks.

Questionnaire

The questionnaire consisted of a general section and two guideline specific sections, including one of the following combinations of guidelines: 1. red eye and cerebrovascular accident (CVA); 2. red eye and urinary tract infections (UTI); 3. thyroid disorders and CVA or 4. thyroid disorders and UTI. The selection of these guidelines, representing acute and chronic conditions and different systems, was based on the results of a previously conducted focus group study ^{7, 31}.

The general section included questions on demographic and professional characteristics of GPs such as age, sex, type of practice, and number of hours worked weekly. In addition, eleven statements about preferred interventions were included, using the taxonomy of interventions of the Cochrane Effective Practice and Organisation of Care Group (EPOC) ¹⁰⁻¹² (Table 1). The selection of interventions was based on results from our qualitative focus group study ⁷. Eight of the included statements focused on professional oriented interventions. The other statements concerned organisational interventions, amendments to the guideline (not in EPOC-classification), and financial interventions. Responses were rated on a 5-point Likert scale (ranging from 1. not at all; to 5.very much) reflecting the extent that the different interventions would encourage the GP to adhere more to guidelines in general.

The guideline specific sections of the survey focused on perceived barriers and preferred interventions; results on perceived barriers were described elsewhere ⁸. For each guideline three to five key recommendations were selected (Appendix 1). For each of these key recommendations, ten statements about different types of interventions to improve guideline adherence were provided. Four of these focused on professional oriented strategies and four concerned organisational strategies. Other statements were related to financial strategies and amendments to the guideline (not in EPOC-classification). The extent that the different interventions would influence GPs' adherence in practice to specific key recommendations was rated on a 5 point Likert scale as well (ranging from 1. not at all; to 5.very much). (see Appendix A; p.229, for an example of the survey for the guideline on red eye).

Analysis

Descriptive statistics were used to describe the demographic characteristics and the preferred interventions of the respondents. For guidelines in general and for each of the key recommendations, we grouped the scores into 3 categories 1 (not at all), 2/3 (little/somewhat) and 4/5 (much/very much) to illustrate the extent that GPs find the different interventions encouraging in adhering more to guidelines in practice.

Table 1 – Overview of interventions in EPOC**Professional oriented interventions**

Distribution of educational materials, educational meetings/ conferences (small group – active participation, big group – passive participation), local consensus processes, educational outreach visits, local opinion leaders, patient mediated interventions, audit and feedback, reminders, peer review.

Financial interventions

Directed towards health professionals (e.g. fee-for-service, capitation, provider incentives, institution incentives, provider grant/allowance, provider penalty) or towards patients (e.g. premium, co-payment, user fee, patient incentives, patient grant/allowance, patient penalty).

Organisational interventions

Changes in the physical structure of healthcare units, in medical record systems or in ownership. These can be structural interventions (e.g. changes in setting/site of service delivery, changes in physical structure, facilities and equipment, changes in medical records systems, staff organization), staff oriented interventions (e.g. revision of professional roles, multidisciplinary teams, case management, formal integration of services) or patient oriented (e.g. interventions to facilitate individual or patient group participation).

Regulatory interventions

Changes aimed to change health-service delivery or costs by regulation or law (e.g. changes in medical liability, management of patient complaints, accreditation, licensure).

Adapted from: Grol R, Wensing M, Eccles M. Improving patient care the implementation of change in clinical practice. 1st ed. London: Elsevier Limited; 2005.

Results**Description of participants**

The overall response rate was 38% (264/703). The different combinations of questionnaires distributed to the GPs yielded the following response for the four guidelines: 122 on red eye; 129 on thyroid disorder; 120 on CVA and 120 on UTI.

Table 2 presents the demographic and professional characteristics of the 264 respondents. Most of them were male (62%) and worked as independent GPs (80%). Compared to the total population of Dutch GPs³², GPs in the age group of 55-64 years were somewhat overrepresented (37% vs. 27%).

Table 2 - Demographic and professional characteristics of the responding GPs (n=264)

	N	%*	Mean (SD)	Total population of Dutch GPs ^{&} (%)
Sex				
Male	165	62.5		61.9
Female	99	37.5		38.1
Age			50.4 (8.9)	-
<35	13	4.9		7.3
35-44	49	18.5		28.7
45-54	75	28.3		36.4
55-64	97	36.6		27.2
>65	2	0.8		0.5
Type of practice ⁺				
Solo	97	36.6		41.8
Partnered	85	32.1		31.3
Group	79	29.8		26.9
Type of physician ⁺				
Independent	212	80.0		88.7
GP working for other GP	30	11.3		11.3
Observer	10	3.8		-
Other	13	4.9		-
Years working as GP				
<3	9	3.4		-
3-7	33	12.5		-
7-10	21	7.9		-
>10	198	74.7		-

* Percentages may not add up to 100 due to missing variables

[&] Only includes independent GPs and GPs working for other GPs (8789 GPs: independent: 7799; GPs working for other GPs: 990).

⁺ More than one answer possible

Preferred interventions for guideline implementation

Preferences for interventions to improve guideline adherence in general

GPs preferred small group educational meetings with active participation as a strategy for improving guideline adherence (Figure 1). Eighty-four percent of the GPs rated this type of intervention as much or very much encouraging. Audit and feedback, organisational interventions and the use of local opinion leaders, were also rated positively by the GPs, with respectively 53%, 50%, and 50% of the GPs rating them as much or very much encouraging.

Moderately rated interventions were changing the guideline/recommendation itself, reminders or computer support and patient mediated interventions; respectively 40%,

40% and 31% of GPs indicated that these strategies would encourage them much or very much to adhere more to guidelines in practice.

Financial interventions, the mere distribution of educational materials, as well as educational big group meetings were of least interest to the GPs. Twenty-four percent of the GPs indicated financial interventions as much or very much encouraging. For the mere distribution of educational materials and educational big group meetings, respectively 22% and 21% rated these interventions as (very) much encouraging.

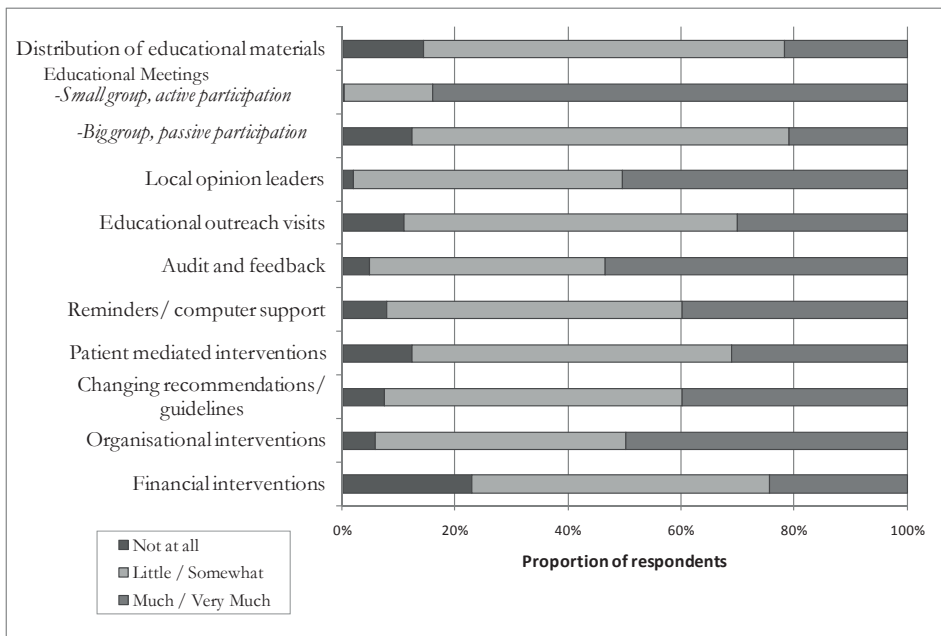


Figure 1 – GPs (%) that rate different interventions as encouraging in improving guideline adherence in general (n=258)

Preferences for interventions to improve adherence to specific key recommendations

Table 3 shows the proportion of respondents that rate the different interventions as much or very much encouraging for each of the 16 key recommendations. Most preferred interventions across the 16 key recommendations were audit and feedback (38%), educational interventions (34%), working arrangements with other health care

providers (31%) and reminders or computer support (30%). Changes in setting and facilities, financial interventions and expansion of practice personnel were the least preferred strategies (7%, 14% and 16% respectively).

The scores varied between the four guidelines, but also between the key recommendations within each guideline, resulting in unique patterns of preferred interventions. Some interventions were preferred by GPs irrespective of specific recommendations. Educational interventions as well as audit and feedback received (relatively) high ratings for all key recommendations. Financial interventions and changes in setting and facilities, as well as changing the guideline/recommendation received relatively low ratings for all key recommendations.

The ratings for other types of interventions depended more so on particular recommendations. Receiving reminders and computer support received overall quite high scores but was particularly rated highly in the treatment recommendations for thyroid disorder (KR9: treatment thyroid hypo function; 42%/KR10: treatment thyroid hyper function; 44%) and on the treatment recommendations for complicated UTI with tissue invasion (KR15: treatment complicated UTI with tissue invasion; 36%/ KR16: treatment complicated UTI without tissue invasion; 35%). High ratings for reminders and computer support were also given for the treatment recommendation in CVA/Stroke (KR6: no blood pressure lowering drugs; 35%) and the referral recommendation in thyroid disorder (KR11: referral in case of thyroid node; 34%). Patient mediated interventions were found particularly useful in the recommendation on red eye discouraging antibiotic use (KR2; 47%) and in education in stroke patients (KR8; 44%), whereas these scored low in all recommendations on UTI (13-18%).

Large variation was found in the preferences for the majority of the organisational interventions. Ratings on education and protocols for practice assistants ranged from 9% in referral of patients with a thyroid node (KR11) to 48% in education of stroke patients (KR8). Expansion of practice personnel received only high ratings for rehabilitation and education of stroke patients (KR7: rehabilitation; 33%/ KR8:

education; 45%). Similarly, working arrangements scored high in recommendations on referral to stroke unit (KR4; 55%), rehabilitation (KR7: 66%) and education (KR8: 55%) in stroke patients, and low in all recommendations on UTI (15-26%) and all recommendations in red eye (14-20%).

Table 3 – Percentage of GPs that rate different interventions as much or very much encouraging, focusing on sixteen key recommendations from four different guidelines

	Professional oriented Interventions				Guideline interventions	
	Educational interventions (%)	Audit/feedback (%)	Reminders/Computer support (%)	Patient mediated interventions (%)	Changing recommendation (%)	
<i>Guideline Red eye (n=122)</i>	27.3	35.4	25.1	28.1	17.4	
KR 1: diagnosis	30.9	35.8	27.6	9.7	18.7	
KR 2: no antibiotics needed	21.6	35.0	20.0	46.7	14.2	
KR3: preferred antibiotic drug	29.4	35.3	27.7	27.9	19.3	
<i>Guideline CVA/Stroke (n=120)</i>	35.3	38.0	28.1	31.2	22.5	
KR4: refer to stroke unit	32.2	39.9	26.3	32.2	22.0	
KR5: risk assessment and aspirin use	40.7	42.3	32.2	26.2	24.5	
KR6: no blood pressure lowering drugs	38.2	43.2	34.7	22.0	18.6	
KR7: rehabilitation	36.4	35.6	27.1	31.3	23.7	
KR8: education	28.8	28.8	20.4	44.1	23.9	
<i>Guideline Thyroid disorder (n=129)</i>	39.8	46.2	39.7	18.7	78.7	
KR9: treatment thyroid hypo function	31.6	50.8	41.5	16.9	16.2	
KR10: treatment thyroid hyper function	50.4	48.0	44.1	24.4	23.6	
KR11: referral in case of thyroid node	37.5	39.8	33.6	14.9	16.4	
<i>Guideline UTI (n=120)</i>	32.7	33.2	29.0	14.9	23.1	
KR12: diagnosis uncomplicated UTI	27.5	30.9	21.7	16.7	23.3	
KR13: treatment uncomplicated UTI	27.5	35.0	26.7	14.2	22.5	
KR14: diagnosis complicated UTI	30.8	30.0	25.8	18.4	23.3	
KR15: treatment complicated UTI with tissue invasion	36.7	35.9	35.8	13.4	20.8	
KR16: treatment complicated UTI without tissue invasion	40.8	34.2	35.0	11.7	25.8	
<i>All 16 recommendations (mean %)</i>	33.8	37.6	30.0	23.2	21.0	

Table 3 – Percentage of GPs that rate different interventions as much or very much encouraging, focusing on sixteen key recommendations from four different guidelines

	Organisational interventions				Financial interventions	
	Expansion of practice personnel (%)	Education/ practice assistants (%)	Changes in setting/ facilities (%)	Working arrangements with other healthcare providers (%)	Provider incentives (%)	
<i>Guideline Red eye (n=122)</i>	11.6	20.7	12.2	17.1	11.3	
KR 1: diagnosis	10.6	14.6	10.6	20.3	15.4	
KR 2: no antibiotics needed	14.1	27.4	13.4	14.1	10.0	
KR3: preferred antibiotic drug	10.0	20.2	12.6	16.8	8.4	
<i>Guideline CV A/ Stroke (n=120)</i>	23.4	31.6	4.2	50.3	18.5	
KR4: refer to stroke unit	12.7	26.2	2.5	55.0	12.7	
KR5: risk assessment and aspirin use	15.3	26.2	2.5	41.6	13.6	
KR6: no blood pressure lowering drugs	11.0	22.8	4.2	33.9	14.4	
KR7: rehabilitation	33.1	34.6	5.9	66.1	28.0	
KR8: education	44.9	48.3	5.9	55.1	23.7	
<i>Guideline Thyroid disorder (n=129)</i>	11.1	19.0	8.0	31.3	15.6	
KR9: treatment thyroid hypo function	14.6	24.7	10.0	14.6	16.2	
KR10: treatment thyroid hyper function	11.1	22.9	10.2	44.1	18.1	
KR11: referral in case of thyroid node	7.8	9.4	3.9	35.1	12.6	
<i>Guideline UTI (n=120)</i>	15.0	34.6	4.5	18.3	9.5	
KR12: diagnosis uncomplicated UTI	22.5	38.7	13.3	25.8	17.5	
KR13: treatment uncomplicated UTI	10.0	26.0	3.3	15.9	7.5	
KR14: diagnosis complicated UTI	20.0	45.4	1.7	16.6	8.3	
KR15: treatment complicated UTI with tissue invasion	10.0	32.8	2.5	18.4	7.5	
KR16: treatment complicated UTI without tissue invasion	12.5	30.2	1.7	15.0	6.7	
<i>All 16 recommendations (mean %)</i>	16.3	28.1	6.5	30.5	13.8	

Discussion

Our study showed that GPs have general as well as recommendation-specific preferences for interventions to improve guideline adherence. Educational interventions and audit and feedback were rated highly by GPs, irrespective of the topic of the guidelines and its recommendations. The ratings of other interventions, such as patient mediated interventions and certain types of organisational interventions (education/protocols for practice assistants and working arrangements with other healthcare providers) varied largely across the key recommendations of the guidelines. As acceptance by the target group is an essential aspect in initiating change, it seems useful to take these preferences into account when developing plans for guideline implementation.

The most preferred intervention among GPs to improve guideline adherence in general were interactive small group educational group meetings. GPs interest in these types of meetings has also been found in other studies ^{7, 26, 31} and several studies have shown that they - as long as they enhance participant activity - indeed are often effective ³³⁻³⁵. A recently conducted barrier study among the same sample of GPs ⁸ showed that lack of knowledge was not regarded as a barrier to guideline implementation. This may indicate that the types of educational meetings that GPs prefer are those that do not focus solely on knowledge transfer, but rather enable them to discuss the content of the recommendations and how to apply them in practice. Beyond a lack of knowledge, this may also address attitudinal and external barriers. GPs do not value unidirectional knowledge transfer, which is supported by our results of big group passive educational meetings being among the least preferred interventions.

Some interventions were evidently not favoured by the GPs. Although the use of financial interventions (e.g. pay for performance) has recently received increased attention, our sample of Dutch GPs did not favour these interventions. In fact, financial interventions were among the lowest scoring interventions for improving guideline adherence in general, as well as for specific key recommendations. This is

consistent with findings from our barrier study among the same sample of GPs ⁸, showing that lack of reimbursement is not perceived as a barrier to guideline implementation. Considering the low ratings of lack of reimbursement as barriers as well as financial interventions to address barriers, our study suggests that financial interventions should not be the focus of guideline implementation plans in the Netherlands.

Results from our study also revealed that some interventions for improving guideline adherence received either high or low ratings from GPs, irrespective of the specific key recommendations in guidelines, whereas other interventions were only valued for improving adherence to certain recommendations. Receiving reminders and computer support were rated particularly high for recommendations on drug prescription or complex decisions such as cases where multiple options are available. In addition, ratings on patient mediated strategies and certain types of organisational interventions (education/protocols for practice assistants and working arrangements with other healthcare providers) varied largely across key recommendations. Our study indicated that changing patient expectations or educational recommendations requires patient mediated interventions. If telephone consultation or diagnostic routines need to be changed, interventions focusing on practice assistants are preferred. If referral of patients or collaboration with specialists is recommended, working arrangements should be set.

In terms of limitations of our study, the representativeness of our sample could be disputed due to the limited response rate. Highly motivated GPs may be overrepresented in our sample, although we tried to minimize this sampling effect by offering accreditation to participating GPs. Moreover, in this paper we argue that identifying preferences of the guideline's target group may be an important factor in determining the success of an intervention and increase guideline use. However, the predictive value of this assumption needs to be further tested. Finally, we used the EPOC taxonomy of interventions to classify barriers ¹⁰⁻¹². As with all taxonomies, the classification of interventions can be debated. Particularly, because the included interventions are sometimes not mutually exclusive (e.g. providing computer support

can be a way of educating the target group). Nevertheless, this widely used taxonomy can be useful in systematically analysing the available range of interventions.

Although it is recognised that interventions should take into account the specific features of the target group, studies examining preferences for interventions among the target group are rare ²⁶, and to our knowledge this is the first study to measure GPs' preferences across a diverse set of recommendations from different guidelines. By systematically analysing the preferences of the target group we have shown that GPs have general and specific preferences for interventions that should be taken into account when developing plans for implementation. Some interventions that are highly rated among the target group, such as small group educational meetings, can be regarded as fundamental components of any intervention to improve guideline adherence. This often needs to be complemented with other interventions tailored to the specific barriers and specific preferences for interventions of the individual recommendations.

Conclusions

If guidelines are to improve quality of care, strategies need to be identified that are optimally linked to the specific features of the target group and setting. In this paper we have shown that the target users of the guidelines have general preferences, independent of the particular guideline recommendations, as well as recommendation specific ones. The composition of an intervention to improve guideline adherence should depend on many factors such as the healthcare setting, available resources, and identified barriers. As acceptance by the target group is crucial for successful implementation and behaviour change, integrating the target groups' preferences for interventions into the implementation plan may be relevant.

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Appendix 1: Key recommendations of guidelines (Dutch)

Guideline 1 Eye Inflammation ('Red eye')/ Het rode oog (M57; 2006)

Kernaanbeveling 1:

Bij een rood oog gepaard gaande met pijn, daling van het gezichtsvermogen of lichtschuwheid (indien niet veroorzaakt door keratoconjunctivitis fotoelectrica, corpus alienum of ander trauma), wordt de visus bepaald, de pupillen en pupilreacties beoordeeld en nader onderzoek van de cornea verricht met behulp van fluoresceïnekleuring.

Kernaanbeveling 2:

Bij diffuse roodheid en afwezigheid van jeuk, alarmsymptomen (pijn, visusdaling of lichtschuwheid) en cornea-afwijkingen, is er waarschijnlijk sprake van een infectieuze conjunctivitis. Indien de klachten korter dan drie dagen duren of er bestaat niet veel hinder, kan worden afgewacht zonder antibiotische behandeling.

Kernaanbeveling 3:

Als bij een (vermoedelijk) bacteriële conjunctivitis (diffuse roodheid, 's ochtends dichtgeplakte ogen en afwezigheid van jeuk, alarmsymptomen en cornea-afwijkingen) wordt besloten tot antibiotische behandeling, gaat de voorkeur uit naar chlooramfenicol oogzalf 1% 2-4 dd. Bij een blefaritis kan ook fusidinezuur worden voorgeschreven, in andere gevallen van conjunctivitis is dit middel niet zinvol gezien de resistentieontwikkeling.

Guideline 2 Cerebrovascular accident / CVA (M81; 2004)

Kernaanbeveling 4:

Patiënten met een CVA (acute neurologische uitvalsverschijnselen, zich uitend in verlamming van ledematen of gelaat, spraakstoornissen, of anderszins) worden op korte termijn verwezen voor opname op een *stroke-unit*, tenzij de uitvalsverschijnselen slechts gering van omvang zijn of spontaan al sterk verbeteren.

Kernaanbeveling 5:

Bij patiënten met een CVA die thuisblijven omdat de uitvalsverschijnselen spontaan sterk verbeteren, wordt een cardiovasculair risicoprofiel opgesteld (zie NHG-Standaard Cardiovasculair risicomanagement). Tevens wordt direct gestart met acetylsalicylzuur 1dd 160 mg gedurende twee weken, waarna de dosering wordt verlaagd naar 1dd 80 mg.

Kernaanbeveling 6:

Bij patiënten met een CVA die thuisblijven omdat de uitvalsverschijnselen spontaan sterk verbeteren, wordt het voorschrijven van bloeddrukverlagende medicatie onmiddellijk na het CVA afgeraden. Het is beter daar twee weken mee te wachten tot de patiënt klinisch stabiel is.

Kernaanbeveling 7:

Bij patiënten met een CVA die thuisblijven, draagt de huisarts zorg voor een spoedige start van de revalidatie - in een verpleeghuis (dagbehandeling), revalidatiecentrum of thuis - en periodieke evaluatie van het beloop en de behoefte aan zorg.

Kernaanbeveling 8:

Ook in de chronische fase (d.w.z. als er geen verbetering meer te verwachten is) geeft de huisarts voorlichting aan patiënten met een CVA en hun centrale verzorgers met het accent op praktische informatie die kan bijdragen aan een zinvolle en bevredigende dagbesteding. Ook worden zij geattendeerd op activiteiten van de patiëntenvereniging zoals lotgenotencontacten, partnercontacten en voorlichtingsbijeenkomsten.

Guideline 3 Thyroid disorder/ Schildklierandoeningen (M31; 2006)

Kernaanbeveling 9:

Streef bij de behandeling van een patiënt met hypothyreoïdie naar een normale TSH-waarde en stel de medicatie (met levothyroxine) verder bij op grond van klachten. Spreek in de instelfase, niet eerder dan zes weken na de laatste doseringsverandering, een laboratoriumcontrole (TSH en vrij T4) af. In het eerste jaar nadat de patiënt klachtenvrij is geworden en het TSH en vrije T4 door medicatie zijn genormaliseerd, vinden de controles elke drie maanden plaats. Spreek vervolgens een jaarlijkse controle af, levenslang.

Kernaanbeveling 10:

Indien de huisarts specifieke kennis heeft van schildklierandoeningen kan een patiënt met hyperthyreoïdie (ziekte van Graves) door de huisarts medicamenteus worden behandeld via de combinatiemethode. Hierbij wordt de schildklier eerst volledig stilgelegd met een thyreostaticum (bij voorkeur thiamazol 1dd30 mg), waarna levothyroxine wordt bijgegeven. Bespreek de voor- en nadelen van de verschillende behandelopties (medicamenteus, radioactief jodium, chirurgie) met de patiënt en betrek hem of haar bij de besluitvorming.

Kernaanbeveling 11:

De huisarts verwijst patiënten met een solitaire nodus of met een dominante nodus in een multinodulair struma naar een internist voor aanvullende diagnostiek.

Guideline 4 Urinary Tract Infections/ Urineweginfectie (M05; 2005)

Kernaanbeveling 12:

Het urineonderzoek bij klinische verdenking op urineweginfecties bestaat in eerste instantie uit een nitriettest, waarna bij een negatieve uitslag een dipslide wordt ingezet.

Kernaanbeveling 13:

Ongecompliceerde urineweginfecties, d.w.z. urineweginfecties bij niet-zwangere, overigens gezonde vrouwen, dienen in eerste instantie behandeld te worden met nitrofurantoïne. Bij overgevoeligheid voor nitrofurantoïne wordt trimethoprim geadviseerd.

Kernaanbeveling 14:

Bij een gecompliceerde urineweginfectie, d.w.z. bij tekenen van weefselinvasie (koorts, rillingen, algemeen ziek-zijn, flank- of perineumpijn) of urineweginfectie bij patiënten uit een risicogroep (mannen, zwangere vrouwen, personen jonger dan 12 jaar, patiënten met afwijkingen aan de nieren of urinewegen in de voorgeschiedenis (zoals ernstige nierinsufficiëntie, cystennieren, nierstenen, een neurogene blaas of bemoeilijkte mictie), patiënten met een verminderde weerstand (zoals tgv. bestraling, immunosuppressiva of diabetes mellitus), patiënten met een verblijfskatheter) dient voorafgaand aan de behandeling urine te worden verzameld voor kweek en resistentiebepaling.

Kernaanbeveling 15:

Bij een gecompliceerde urineweginfectie dienen patiënten met tekenen van weefselinvasie, evenals alle jongens tot 12 jaar, meisjes tot en met 4 jaar en daarnaast patiënten met aandoeningen van de nieren of urinewegen, een verminderde weerstand (m.u.v. diabeten) of een verblijfskatheter, gedurende 10 dagen te worden behandeld met amoxicilline/ clavulaanzuur, totdat de uitslag van de kweek en resistentiebepaling bekend is. Bij overgevoeligheid dient dit te worden vervangen door co-trimoxazol of een fluorochinolon (norfloxacin 2dd400 mg of ciprofloxacine 2dd500 mg, maar niet in de zwangerschap of tijdens lactatie of bij leeftijd < 16 jaar).

Kernaanbeveling 16:

Bij een gecompliceerde urineweginfectie bij patiënten zonder tekenen van weefselinvasie dienen mannen, zwangeren, meisjes van 5-12 jaar en diabeten gedurende 7 dagen te worden behandeld met nitrofurantoïne totdat de uitslag van de kweek en resistentiebepaling bekend is. Bij overgevoeligheid voor nitrofurantoïne wordt gekozen voor 7 dagen trimethoprim.

A person wearing a patterned dress and white high heels is walking on a paved path. They are carrying a black bag filled with various medicine boxes, including brands like 'DOR', 'RETARDON', 'Durolofon', and 'Josacoline 50'. The scene is overlaid with a semi-transparent grey filter.

Chapter 9

General Discussion

Extended version of:

Marjolein Lugtenberg, Jako S. Burgers, Gert P. Westert. Guideline adherence in practice: the gap between theory and practice explored. *International Public Health Journal*, *In press*.

Introduction

Clinical guidelines aim to improve the quality of care, but their implementation in practice remains challenging. The main objective of this thesis (*the GAP study*) was to generate knowledge about the gap between the availability of a wide range of guidelines and their limited uptake in clinical practice and to provide recommendations about bridging this gap. Three main issues were addressed:

1. Effects of guidelines on quality of care with regard to structure, process and outcomes of care
2. Perceived barriers to guideline adherence among physicians
3. Useful and well-accepted interventions to address barriers in order to improve guideline adherence

This final chapter summarises the main findings of this thesis and provides an interpretation of the findings. Subsequently, the main methodological issues of the used research methodologies are described. Finally, the implications of the results for guideline developers, guideline implementers, clinical practice, policy makers as well as the implications for future research are discussed.

Main findings

Effects of guidelines on quality of care

Despite considerable investments in the area of guideline development and implementation in the Netherlands, no reviews were available on their effectiveness. The review presented in Chapter 2 showed that Dutch evidence-based guidelines can be effective in improving the quality of care. The majority of the studies reported improvements in the process and structure of care as a result of guidelines. Effects of guidelines on patient outcomes were also found, although these outcomes were studied far less and results were less convincing.

Results from our review also revealed that the effects of guidelines varied largely between recommendations in guidelines. Dissemination or implementation of the guidelines showed large effects for some recommendations on changing clinical practice, whereas for other recommendations the impact was minimal. This finding was confirmed in our survey study described in Chapter 7, showing that the reported adherence rates among GPs varied largely across recommendations in guidelines.

We conclude that Dutch guidelines can be effective in improving the quality of care, particularly regarding the process and structure of care. The effectiveness of guidelines varied largely between recommendations, suggesting that it may be useful to focus on recommendations rather than guidelines as a whole, both in analysing barriers to guideline adherence as well as in designing interventions to improve adherence. Due to the limited number of available high-quality studies, we were not able to determine which factors were associated with guideline utilisation and improved patient outcomes.

Perceived barriers to guideline adherence

An important motive for conducting the GAP study was the suboptimal level of guideline adherence among physicians that creates a gap between theory and practice. The second objective of this thesis was to explore the gap between theory and practice by identifying the barriers that physicians perceive in adhering to guidelines in practice.

The qualitative focus group study described in Chapter 3 was conducted to identify the range of barriers that GPs perceive in adhering to key recommendations from a diverse set of guidelines. GPs reported a wide range of barriers that prevented them from following guideline recommendations in practice. These concerned barriers related to knowledge and attitude as well as external barriers ¹. The most prominent barriers across the key recommendations were: lack of agreement with the guideline recommendation due to lack of applicability or lack of evidence, environmental factors such as organisational constraints, and lack of knowledge regarding guideline recommendations. In addition, different key recommendations in guidelines elicited specific patterns of perceived barriers. For example, whereas for one particular

recommendation the perceived barriers were related to knowledge and attitude, barriers for another recommendation consisted of a specific combination of external barriers.

The patterns of barriers across key recommendations were described in more detail in Chapter 4. In this study, an overview was presented of the barriers that GPs perceive in adhering to the key recommendations of the guideline on uncomplicated urinary tract infections (UTI). Barriers for diagnosing uncomplicated UTI were a lack of agreement with the guideline recommendation, unavailable and inconvenient materials (i.e. dipslides) and organisational constraints. With respect to the treatment of uncomplicated UTI, Dutch GPs reported lack of applicability of the recommendation and organisational constraints related to the availability of drugs in pharmacies as barriers that prevented them from following the guideline recommendation in practice.

Whereas the qualitative studies described in Chapter 3 and 4 provided detailed insight in the range of barriers that apply across key recommendations in guidelines, quantitative studies were needed to quantify the prevalence of the barriers in a larger sample across the target group. In Chapter 7 a survey study was presented, which aimed to assess the perceived barriers among Dutch GPs in adhering to sixteen key recommendations from four guidelines. Overall, the perceived barriers were limited. The most perceived barriers across key recommendations were related to patient factors, lack of applicability in general and more specifically to individual patients. Barriers that were hardly applicable across recommendations were lack of knowledge with the guideline recommendation, lack of evidence, lack of outcome expectancy and lack of reimbursement. Many barriers were applicable to some recommendations only, resulting in varying patterns of barriers across key recommendations. We summarise the relevance of the perceived barriers to guideline adherence among Dutch GPs in Box 1.

Box 1 – Perceived relevance of barriers to guideline adherence among Dutch GPs

Barriers widely applicable	Barriers applicable to some recommendations	Barriers hardly applicable
<i>Attitude related barriers</i> Lack of applicability - in general - to individual patients /specific patient groups	<i>Attitude related barriers</i> Lack of self-efficacy Inertia of previous practice/lack of motivation	<i>Knowledge related barriers</i> Lack of awareness/familiarity with guideline recommendation
<i>External barriers</i> Patient factors - Patient preferences and demands - Patient abilities and behaviour	<i>External barriers</i> Guideline recommendation factors Environmental factors - Lack of time/ time pressure - Lack of resources/materials - Organisational constraints	<i>Attitude related barriers</i> Lack of/ interpretation of evidence Lack of outcome expectancy <i>External barriers</i> Environmental factors - Lack of reimbursement

Classification of barriers is based on the framework of Cabana et al. ¹ and results from the focus group study (Chapter 3 and 4).

To gain insight in the barriers that specialists perceive in adhering to guidelines in practice, we also conducted a survey among Dutch dermatologists (Chapter 5). This survey focused on perceived barriers to the implementation of the guidelines for the treatment of moderate to severe plaque psoriasis. Dutch dermatologists reported a high awareness and familiarity with the psoriasis guidelines, showed generally positive attitudes and reported few practical and organisational barriers to following the guidelines in practice. However, some dermatologists questioned whether the psoriasis guidelines facilitated patient communication, had concerns about the user-friendliness of the guidelines and believed that the guidelines showed too little consideration for wishes of patients, which is in line with our findings in the studies conducted among Dutch GPs.

One of the most prevalent barriers among Dutch GPs was a perceived lack of applicability of guideline recommendations in practice. In Chapter 6 we studied an important aspect of this barrier in more detail, i.e. lack of applicability due to comorbidity. We systematically assessed the content of an international sample of evidence-based guidelines in terms of the extent that they address comorbidity as well as the supporting evidence of recommendations related to comorbidity. Results showed that most guidelines do not provide explicit guidance on treatment of patients with specific combinations of diseases, particularly for discordant combinations which

need to be managed by different medical specialists. In addition, the link with the underlying evidence was often poorly described and the available evidence was scarce.

Interventions to improve guideline adherence

The last issue discussed in this thesis was identifying useful and well accepted interventions among physicians from the target group addressing these barriers in order to improve guideline adherence in practice. In Chapter 4 and 8 two studies are described aimed at identifying useful interventions to address barriers to guideline adherence, focusing on the level of the key recommendations and by involving the target group of GPs in this process.

In the focus group study described in Chapter 4, GPs were asked to discuss interventions that would be useful to remove the barriers for the key recommendations on diagnosing and treating uncomplicated UTI. Suggested interventions for the key recommendations on uncomplicated UTI were to provide interactive small group education to GPs and other staff members, to improve the organisation and coordination of care in out of hours services, to improve the availability of preferred dosages of drugs, to pilot-test the guidelines regionally, and to adapt guideline recommendations to current practice. The key recommendations on diagnosing and treating uncomplicated UTI showed specific combinations of preferred interventions.

The survey study presented in Chapter 8 aimed to identify GPs' preferences for interventions to improve guideline adherence among a larger sample of GPs. We explored their preferences for interventions for improving guideline adherence in general, as well as for specific recommendations. The most preferred interventions for improving guideline adherence in general were interactive small group educational meetings as well as audit and feedback. Some interventions were not favoured to improve guideline adherence in general, in particular financial interventions, the distribution of educational materials and big group educational meetings.

In line with the study described in Chapter 4, this study also showed that different recommendations in guidelines provoked different patterns of preferred interventions.

Whereas some interventions received either high scores or low scores across a diverse set of recommendations, ratings of other interventions differed more across key recommendations. For example, reminders and computer support were rated particularly high for recommendations on drug prescription or complex decisions when multiple options are available. In addition, ratings on patient mediated strategies and certain types of organisational interventions varied largely across key recommendations. In Box 2, GPs' preferences for interventions measured at the level of key recommendations are summarised.

Box 2 – GPs' preferences for interventions to improve guideline adherence

Interventions highly rated for all recommendations	Interventions highly rated for some recommendations	Interventions with low ratings across recommendations
<i>Professional oriented interventions</i>	<i>Professional oriented interventions</i>	<i>Organisational interventions</i>
Educational interventions	Reminders/computer support	Changing in setting and facilities
- Interactive small group meetings	Patient mediated interventions	
Audit and feedback		<i>Financial interventions</i>
	<i>Organisational interventions</i>	Provider incentives
	Education/ protocols practice assistant	
	Expansion of practice personnel	<i>Guideline interventions</i>
	Working arrangements with other healthcare providers	Changing recommendation

*Classification of interventions is based on EPOC-taxonomy^{2,4} and results from the focus group study (Chapter 3 and 4)

Interpretation of findings

Guidelines are considered as useful tools to improve quality of care, but uncertainty exists as to what extent they are effective. Findings from our systematic review presented in Chapter 2, showing that there is evidence that Dutch guidelines can be effective in improving the process and structure of care, are consistent with the evidence from international reviews⁵⁻⁷. With respect to patient outcomes, results from previous reviews were inconsistent^{5, 8, 9}. Many of the studies included in previous reviews, however, used guidelines that were not developed according to the principles of evidence-based guideline development⁹. Our review provided some evidence for the effects of guidelines on patient outcomes. It seems that evidence-based guidelines can improve the quality of care, but more studies are needed to draw firm conclusion

on the effects of guidelines on patient outcomes and on the factors that influence guideline utilisation and improved patient outcomes.

Previous studies have shown that a large number of barriers may contribute to guideline non-adherence among physicians ^{1, 10-16}. Most studies show that attitude related barriers and external barriers are more often perceived than knowledge related barriers, which is consistent with the findings from our survey study (Chapter 7). However, we found that lack of knowledge regarding guideline recommendations was perceived as a barrier in the focus group study (Chapter 3). Discrepancies between qualitative and quantitative studies have been found before and may be related to the superficial nature of a survey compared to the more problem-oriented focus in qualitative studies ¹⁷. On the other hand, the aim of the focus group study was to identify the range of barriers across key recommendations, whereas the survey aimed to explore the relevance of the barriers among a larger sample of the target group. More research on the extent that physicians perceive knowledge related barriers, comparing different methods, would be useful.

The most perceived barriers among Dutch GPs were lack of applicability and patient factors, suggesting that current guidelines may not always adequately address characteristics of specific patient groups (e.g. comorbidities) as well as patient preferences, needs and abilities. Other studies also showed that GPs can have difficulties balancing the needs and preferences of individual patients with the aggregated needs of the population ^{1, 15, 17}. This leads physicians to deviate from guidelines by adjusting practice to the patients' individual needs. However, these studies focused on guidelines as a whole rather than on key recommendations within guidelines. This thesis confirms the importance of these barriers and shows that they are widely applicable across key recommendations in guidelines.

One of the reasons that GPs find guideline recommendation not particularly applicable in practice is due to comorbidities. As almost half of the patients with a chronic disease have more than one disease ^{18, 19}, guidelines focusing on single diseases may be less applicable to patient populations in practice ²⁰. Previous studies have also indicated

that comorbidities of patients can act as a barrier to guideline adherence ^{21, 22, 15}. Our systematic review of guidelines in Chapter 6 showed that current guidelines indeed provide little guidance to physicians in treating patients with comorbidities, which is in accordance with results from a previous study ²³. The limited attention to comorbidity in guidelines may be explained by the lack of evidence on patients with comorbid conditions. Consistent with previous studies, our findings indicate that the evidence base for patients with multiple chronic conditions is limited ^{24, 25}. The evidence described in guidelines often does not focus directly on groups of patients with comorbid conditions and it is rare for guidelines to adequately describe the strengths and limitations of the evidence.

Studies measuring preferences for interventions among the target group are rare ²⁶ and, to our knowledge, the study presented in Chapter 8, was the first to systematically measure GPs' preferences across a diverse set of recommendations from different guidelines. The preference of GPs for interactive small group educational meetings as a method to improve guideline adherence in general has been found before ²⁶ and several studies have shown that these can be effective ²⁷⁻²⁹. Whereas financial interventions such as pay-for-performance demand a lot of attention these days, GPs in our studies did not consider financial interventions as a useful method to improve adherence to guideline recommendations in practice, nor did they report lack of reimbursement to be a barrier to guideline adherence.

Methodological considerations

We used a variety of research methods to examine the research objectives of this thesis. These included a systematic literature review, a qualitative focus group study, quantitative cross-sectional survey studies, as well as a systematic review of guidelines. In the majority of the studies described in this thesis, we used a particular research method by focusing on key recommendations in guidelines and by involving the target group in identifying barriers and useful interventions to address these barriers. In the separate chapters of this thesis, the specific limitations of the various studies have

already been discussed. Here, the general methodological strengths and weaknesses of the used research methodology are discussed.

Focusing on key recommendations proved to be a useful method as different recommendations in the guidelines provoked different patterns of barriers as well as different patterns of preferred interventions. By focusing on key recommendations, we identified detailed information on barriers and interventions that would not have been revealed if we had focused on the guidelines as a whole. In addition, systematically focusing on key recommendations in guidelines guaranteed that the most important aspects of the guideline were taken into account and not only the most salient ones. Therefore, it seems to be a feasible and useful method which was also appreciated among the target group.

We involved the target group in identifying barriers and interventions to address these barriers. Studies examining preferences for interventions among the target group are rare and in practice, the target group is usually not involved in identifying interventions for guideline implementation ²⁶. We demonstrated that GPs have specific and concrete ideas on how to address barriers. Useful interventions from the perspective of the target group do not always follow directly from the identified barriers and are not necessarily located at the same level (knowledge, attitude or external) as the identified barriers. Involvement of the target group also helps the target group to consider the interventions as their own and may encourage them to take responsibility for it. As acceptance and local support are essential in initiating behaviour change, integrating the target groups' preferences for interventions into the implementation plan, may be useful to optimise guideline adherence.

Several methodological limitations should be mentioned. First, barrier studies focus on perceived barriers and thus depend on physicians' perceptions of the situation. These perceptions may not accurately reflect the (whole range of) barriers. Whether the barriers are actual or perceived may directly affect the effectiveness of interventions to address the barriers. Complementing this type of research with more objective methods seems useful. Similarly, perceived adherence rates may be subject to the

phenomenon of social desirability, resulting in overestimations of adherence rates ³⁰. On the other hand, there are indications that self-reporting among physicians is a valid and reliable source for assessing clinical performance, with high levels of agreement with data from medical records ³¹. The fact that the adherence rates in our survey study corresponded well with those found in a comprehensive study among Dutch GPs using medical records ³², makes our findings plausible.

We identified GPs' preferences for interventions to remove the barriers based on the assumption that identifying and integrating the target groups' preferences by means of a bottom-up approach, can eventually improve the success of implementation plans. Whether these preferences are in fact important in determining the success of an intervention, however, needs to be further tested. In addition, the composition of an intervention to improve guideline adherence does not only depend on the identified barriers and preferences of the target group regarding interventions, but also on other factors such as the specific healthcare setting and the available resources. Therefore, the feasibility of the suggested interventions is unknown. In particular, the introduction of small educational meetings on a large scale may be difficult due to limited numbers of teachers and supporting facilities ³³.

We used an existing framework of barriers in this thesis ¹. Although the use of this framework was useful, the classification of barriers can be debated. Based on the finding from our studies, we suggest that lack of applicability, including potential reasons such as comorbidity, should be a more prominent category. In addition, patient factors should also include patients' abilities, needs and behaviour, rather than just their preferences. Apart from the classification of barriers, the suggested sequence of stages in Cabana's framework could be debated. In the framework, guideline factors are part of the external barriers, suggesting that, if physicians are aware of guideline recommendations (knowledge) and want to follow them (attitude), guideline factors as well as other external barriers can affect a physician's ability to follow the recommendations. We suggest that guideline factors, such as unclear or ambiguous recommendations, should be located before the knowledge related barriers, as they directly influence the knowledge regarding the guideline recommendations.

In identifying preferences for interventions we used the EPOC-taxonomy²⁻⁴, a widely accepted taxonomy of interventions, as a basis for our questionnaire on interventions to improve guideline adherence. However, the classification of interventions of this taxonomy can also be disputed as some of the included interventions are not mutually exclusive (e.g. providing computer support can be a way of educating the target group). In addition, new developments such as the use of decision aids to promote the flexible use of guidelines and shared decision making are not included in this taxonomy.

Another limitation of this thesis is that we focused primarily on GPs. Only one study concerned another group of physicians, i.e. dermatologist. Although the findings from this study were fairly consistent with our findings among Dutch GPs, this thesis does not allow us to draw firm conclusions on the perceived barriers among medical specialists. Similarly, we did not include other disciplines, such as practice assistants and practice nurses in the studies. As guideline adherence often also depends on their contributions to the process of care, including their views in identifying barriers and effective interventions would be of use. Quality improvement projects involving all practice staff, such as NHG practice accreditation (NPA), can facilitate this process³⁴. Finally, we did not involve patients in our studies. As patient factors and lack of applicability to patients are among the most relevant barriers that Dutch GPs perceive in adhering to guideline recommendations in practice, including patient views in these types of studies could yield valuable information.

Implications

Based on finding from this thesis we can formulate several implications for guideline developers, guideline implementers, policy makers, clinical practice as well as for future research.

Implications for guideline developers

Developing guidelines is challenging. Results from this thesis indicate that Dutch GPs are generally positive about NHG guidelines and do not argue their clinical content and scientific basis. However, they do believe that recommendations are not always

well applicable in practice, indicating that guidelines do not adequately address characteristics of specific patient groups such as comorbidities as well as individual patient preferences, needs and abilities.

Although it is not feasible for guideline developers to create guidelines and recommendations for each and every single combination of diseases, guidelines could be more explicit about the applicability of their recommendations to patients with the most prevalent combinations of diseases. The quality and directness of the evidence for these patients should be discussed as well. This explicit approach should replace the implicit assumption that guideline recommendations are applicable to patients with comorbid conditions unless conflicting evidence is available ³⁵.

Currently, a framework is being developed to support guideline developers in integrating comorbidity within guidelines. This approach is led by a research team at the John Hopkins University in Baltimore. Based on this framework, it might be useful to create a guide for guideline developers on how to address comorbidity in each step of the guideline development process, to facilitate a systematic and uniform approach.

To improve the applicability of guideline recommendations it may be useful to involve patients in the process of guideline development ^{36,37}. There is a growing acknowledgement of the need to involve patients in guideline development and in recent years several programmes, using a wide range of methods, have been developed ³⁸. By considering patients' norms and values in the interpretation of the research evidence and its translation in recommendations, these programmes aim to increase the responsiveness of guidelines to population expectations and needs ^{38, 39}. Focus group studies or other interactive meetings among patients to explore the barriers related to the recommendations could yield valuable information for guideline implementers and developers in the process of updating guidelines.

Although addressing the applicability of guidelines by integrating patients' perspectives is relevant, guidelines are conceptually based on the 'average' patient. They can integrate the collective perspective of patients but cannot represent an individual

patient's preferences and needs^{40,41}. To optimise the applicability of guidelines, it may be useful to foster not only patient involvement in the process of guideline development but also in the process of actual decision making. Guidelines could be adapted to facilitate the integration of individual patients' preferences in clinical decision making⁴². Additionally, tools such as decision aids to support the flexible use of guidelines to individual patients in practice could be helpful.

Implications for guideline implementers

For guideline implementation, a detailed analysis of barriers as well as preferred interventions among the target group at the level of the key recommendations is suggested. Guideline recommendations share barriers and preferred interventions, but also show unique patterns. An in-depth analysis of perceived barriers and preferred interventions can provide detailed information on how to improve guideline adherence. This information can be used in designing specific and tailored interventions and should replace the tendency for the selection of interventions to be driven by researchers' preferences of and familiarity with types of interventions.

By focusing on barriers that are widely applicable across recommendations in guidelines, and by integrating interventions that are highly rated among the target group, substantial improvements can be achieved. Aside from offering tools such as decision aids to support the flexible use of guidelines to individual patients in practice, our results indicate that physicians value small group education as a method to improve guideline adherence. In contrast to traditional strategies using large scale educational meetings, interactive small group educational meetings that encourage discussion of the guideline recommendations and how to deal with them in practice, may be considered as a basic component of any intervention to improve guideline usage.

This often needs to be complemented with additional interventions tailored to the specific recommendations and their barriers, such as computer reminders and feedback on performance. GPs value reminders and computer support as a method to improve adherence, particularly for recommendations on drug prescription or complex

decisions when multiple options are available. Specific computer programs could be designed to be integrated in electronic patient records, in addition to the electronic prescription system (i.e. EVS: Elektronisch Voorschrijfsysteem), which is widely used among Dutch GPs. Currently, a computerised decision support systems (CDSS) for GPs (NHGD ϕ) is being implemented in Dutch general practices in the Netherlands ⁴³. These programs could also help GPs in providing relevant data needed for feedback on performance on an aggregated level, which may reduce the administrative burden.

Implications for clinical practice

Guidelines are not always easy to apply in practice. For physicians using guidelines for patients with multiple diseases it is important to realise that guideline recommendation are based on the ‘average’ patient and that recommendations are often based on limited evidence of selected patient populations. Nevertheless, guidelines can help in weighing pros and cons in the decision making process, also for patients with multiple diseases.

Discussion of the guideline and its recommendations in peer groups may be useful. Findings from this thesis indicate that these peer groups may be particularly useful and appreciated if they enable participants to discuss the content of the recommendations and how to deal with them in practice. In addition, opinion leaders could show best practices and illustrate how they overcome the barriers. Learning from colleagues has shown to be effective in general practice ⁴⁴. In addition, communication and agreements between GPs and medical specialists in local hospitals can be helpful to address the external barriers ⁴⁵.

Implications for policy makers

Policy makers are increasingly interested in guidelines as a basis for coverage and reimbursement decisions ⁴⁶. In addition, there is a growing interest in pay-for-performance initiatives, which reward practitioners for providing specific elements of care ⁴⁷. However, caution is required with linking financial fees and incentives to adhering to recommendations in guidelines by individual physicians, as these can also introduce undesirable effects such as reduced continuity of care ⁴⁸.

Clinical guidelines are based on evidence and expert consensus and aim to assist decision making on treating specific diseases ⁴⁹. In some cases, deviating from guidelines is desirable and even required; rigid and uncritical adherence to guidelines without clinical judgment is not the rationale of guidelines. We have shown in this thesis that lack of applicability and patient factors are among the most perceived barriers among GPs. They often deviate from guideline recommendations by adjusting practice to the patients' individual characteristics. Moreover, GPs did not perceive lack of reimbursement as a barrier, nor did they value financial incentives as a method to improve guideline adherence, questioning the effectiveness of these interventions. Therefore, financial programmes should be introduced only cautiously; only if they are able to adequately address differences in case-mix, comorbidity and patient preferences, they will not pose a threat to quality of care ²³.

Implications for future research

This thesis builds on previous research on barriers and interventions in guideline research. In identifying barriers to guideline adherence and interventions to address these barriers we used a bottom up approach, by focusing on key recommendations in guidelines and by involving the target group in each phase of the project. Future research is needed to determine whether integrating the target groups' views on barriers and interventions is indeed important in determining the success of an intervention. To this end, experimental designs comparing interventions that integrate views of the target group versus regular interventions with as primary outcome guideline adherence are needed.

In this thesis we showed that key recommendations elicit specific patterns of barriers as well as patterns of preferred interventions to address these barriers. A follow-up study using a larger sample of key recommendations is needed to determine the exact relationship between the type of recommendations (e.g. diagnosing, treatment, referral) and the perceived barriers and preferred interventions. Moreover, future research could explore the variation in perceived barriers and preferences for interventions across healthcare providers. To the extent that individuals in the target group differ concerning their perceived barriers and preferred interventions, it may be useful to

tailor the composition of the interventions to individual physicians or subgroups of physicians.

Finally, research on the effectiveness of interventions should also include patients with multiple diseases. Most research studies focus on the effectiveness of disease-specific interventions and patients with comorbidities or complex problems are often excluded from clinical trials^{24, 25}. For guideline recommendations to be more widely applicable and relevant to clinical practice, it is recommended that future clinical trials also include patients with comorbid conditions, at least for the most common combination of diseases^{23, 50}. This would provide the evidence base that clinical guideline developers need to improve the applicability of guidelines.

Conclusion

In this thesis we have gained insight in the gap between the availability of a wide range of guidelines and their limited use in practice and provided recommendations on bridging this gap. We found a wide range of barriers contributing to the gap, with some of them being widely applicable across recommendations, and others being relevant for some guideline recommendations only. The most perceived barriers were lack of applicability and patient factors, indicating that current guidelines do not always adequately incorporate characteristic of specific patient groups (e.g. comorbidities) and patient preferences, abilities and needs. To increase guideline use it is important to improve the applicability of guidelines and to offer tools supporting the flexible use of guidelines in practice. Interactive small group educational meetings that encourage discussion of the guideline recommendations and how to deal with them in practice may also be beneficial. In addition, tailored interventions to address barriers for specific key recommendations are often needed. Further research is needed to test the effectiveness of involving the target group in guideline implementation.

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A person wearing a patterned dress and high heels is carrying a large black bag. The bag is overflowing with various medicine boxes and bottles, including brands like 'OR', 'RETINOL', 'Dermolone', and 'Josacilin 50'. The person is walking on a paved path with a white line. The image is in grayscale.

Summary

Clinical practice guidelines are systematically developed statements to assist practitioner and patient decisions about appropriate healthcare for specific clinical circumstances. By translating the best-available evidence into specific recommendations for clinical practice, they can facilitate the uptake of new research findings and insights into clinical practice. Therefore, they are commonly regarded as useful tools to improve quality of care.

A wide range of guidelines have been developed in the last three decades covering a variety of conditions and diseases in all areas of medicine. In addition, considerable efforts have been invested in the implementation of guidelines in practice. Despite the widespread distribution and promotion of clinical practice guidelines, only a modest impact has been found on clinical practice. Both national and international studies show that adherence to guidelines among physicians is often suboptimal, with adherence levels varying largely between providers, practices and hospitals. In other words, there is a gap between theory and practice.

The main objective of this thesis - the GAP study (*Guideline Adherence in Practice*) - was to generate knowledge about the gap between the availability of a wide range of guidelines and their limited uptake in clinical practice as well as to provide recommendations about bridging this gap. The specific research objectives of this thesis were as follows:

1. To assess the effects of guidelines on quality of care with regard to structure, process and outcomes of care.
2. To identify perceived barriers among physicians (general practitioners (GPs), medical specialists) in adhering to guidelines in practice.
3. To explore appropriate and well-accepted interventions among physicians from the target group that address these barriers, in order to improve guideline adherence in practice.

A variety of both qualitative and quantitative research methods were used to examine the research objectives of this thesis. These included a systematic literature review, a qualitative focus group study, two quantitative cross-sectional survey studies, as well as a systematic analysis of guidelines. In contrast to most other studies, the GAP study focused on the level of key recommendations rather than guidelines as a whole, both in identifying barriers and in identifying interventions to address these barriers. Moreover, in designing interventions to improve guideline adherence, we aimed for active involvement of the target group instead of a top down approach.

In **Chapter 2** a systematic review of the literature on the effects of evidence-based guidelines on quality of care in the Netherlands was described. Since the 1990s, significant time and efforts have been invested in the development and implementation of evidence-based guidelines in the Netherlands, but thus far no reviews were available on their effectiveness. Therefore, we reviewed studies evaluating the effects of Dutch evidence-based guidelines on both the process and structure of care and patient outcomes. It was found that Dutch evidence-based guidelines can be effective in improving quality of care. The majority of the studies reported improvements in the process and structure of care as a result of guidelines. Effects of guidelines on patient outcomes were also found, although these were studied far less and data were less convincing. Results also revealed that the effects of guidelines varied largely between recommendations, suggesting that it might be more useful to focus on individual recommendations, rather than on guidelines as a whole, when analysing barriers to adherence and in designing interventions to improve adherence.

Chapter 3 examined the barriers that Dutch GPs perceive in adhering to a diverse set of national guidelines for general practice. As different recommendations within a guideline can have different barriers, we focused on key recommendations in this study. By conducting six qualitative focus group sessions in which twelve national guidelines and 56 recommendations were discussed, we provided an overview of the barriers that GPs perceive in adhering to guideline recommendations in practice. Dutch GPs appeared to perceive a broad range of barriers in adhering to recommendations of guidelines in practice. The three most prominent barriers across

key recommendations were: 1. Lack of agreement due to lack of applicability or lack of evidence; 2. Environmental factors such as organisational constraints; and 3. Lack of knowledge regarding the guideline recommendations. We also found that the perceived barriers varied largely within guidelines and that each recommendation had their own pattern of barriers. Therefore, we concluded that tailored and barrier-driven interventions focusing on key recommendations are often needed to improve guideline adherence in practice.

Chapter 4 presented the findings concerning one of the guidelines addressed in the focus group study in more detail, i.e. the guideline on uncomplicated urinary tract infections (UTI). Whereas the study presented in Chapter 3 provided an overview of the barriers that GPs perceive in adhering to a diverse set of guidelines, in this chapter an in-depth understanding of the perceived barriers and useful interventions to address these barriers was provided for one particular guideline. We found that lack of agreement with the recommendations, unavailable and inconvenient materials and organisational constraints were perceived as barriers for the diagnostic recommendations. Barriers to following the treatment recommendations were lack of applicability and organisational constraints related to the availability of drugs in pharmacies. Suggested interventions were to provide small group education to GPs and practice staff members, to improve organisation and coordination of care in out of hours services, to improve the availability of preferred dosages of drugs, and to pilot-test guidelines regionally. This study demonstrated that GPs have very practical and concrete ideas about interventions to improve adherence, which were not always the most obvious ones. Involving the target group in selecting useful interventions to implement guideline recommendations may therefore improve the feasibility and success of interventions.

Chapter 5 reported on the perceived barriers to guideline adherence in specialist care rather than primary care. By means of a cross-sectional survey among Dutch dermatologists, the knowledge related, attitude related and external barriers to adhering to the guidelines for the treatment of moderate to severe plaque psoriasis were described. Dutch dermatologists reported a high awareness and familiarity with the

psoriasis guidelines, showed generally positive attitudes and reported few practical and organisational barriers to following the guidelines in practice. However, some dermatologists questioned whether the psoriasis guidelines facilitated patient communication, had concerns on the user-friendliness of the guidelines and believed that the guidelines showed too little consideration for wishes of patients.

Chapter 6 elaborated on one important barrier to guideline adherence, which is lack of applicability due to comorbidity in patients. By systematically assessing the content of an international sample of evidence-based guidelines on four highly prevalent chronic conditions (chronic obstructive pulmonary disease, depressive disorder, diabetes mellitus type 2, and osteoarthritis) we aimed to determine the extent that current guidelines are applicable to patients with comorbid conditions. Our guideline study revealed that the applicability of current evidence-based guidelines to patients with comorbid conditions is limited. Most guidelines do not provide explicit guidance on treatment of patients with comorbidity, particularly for discordant combinations. We also found that the evidence underlying comorbidity-related recommendations is often limited, of poor quality and not adequately translated into the guidelines. We concluded that, in light of the general absence of evidence on patients with comorbidities, guidelines should be more explicit about the applicability of their recommendations and supporting evidence to patients with comorbidity. In addition, more research evidence is needed on the optimal management of patients with the most prevalent combinations of chronic conditions.

Chapter 7 again focused on the perceived barriers to guideline adherence among Dutch GPs and complements the findings of the focus group study. Whereas the perceived barriers were explored qualitatively in Chapter 3 and 4 of this thesis, in this chapter these results were quantified by describing the relevance of each of the barriers in adhering to recommendations of a diverse set of guidelines in practice. Aside from barriers to adhering to specific guideline recommendations, the perceived adherence and the attitude towards the NHG guidelines in general were measured. The results of the survey showed that Dutch GPs have a general positive attitude towards the NHG guidelines, reported high adherence rates and low levels of perceived barriers.

However, the perceived adherence and perceived barriers varied largely across recommendations. The most perceived barriers - that were widely applicable across recommendations in guidelines - were patient related (lack of applicability to patients and patient factors), suggesting that current guidelines do not always adequately incorporate patient preferences, needs and abilities. Many other barriers (e.g guideline recommendation factors, lack of time, and organisational constraints) were applicable to some recommendations only, highlighting once again the importance of focusing on recommendations rather than guidelines as a whole.

Chapter 8 addressed GPs' preferences for interventions to improve guideline adherence in practice and described whether these preferences differed across recommendations in guidelines. By means of a survey study among 264 Dutch GPs, we showed that GPs prefer interactive small group educational meetings and audit and feedback as methods to improve guideline adherence in general. Financial interventions, the distribution of educational materials, as well as big group educational meetings were of least interest to the GPs. Moreover, certain interventions were preferred by GPs irrespective of the topic of the guideline and its recommendations (educational meetings, audit and feedback), while ratings for other strategies differed across recommendations (e.g. reminders/computer support, patient interventions, certain organisational interventions). We concluded that key recommendations do not only elicit varying patterns of barriers, but also varying patterns of preferred interventions. As acceptance by the target group is crucial for successful implementation, it seems useful to take, aside from the specific barriers, also these preferences into account when developing plans for guideline implementation.

Finally, in **Chapter 9**, the main findings of this thesis were summarised and discussed, followed by the methodological considerations of this study as well as the implications of the findings for guideline development, implementation, clinical practice, policy makers and future research. The following **main conclusions** with regard to the three research objectives were distilled:

With respect to the first research objective we concluded that evidence-based guidelines can be effective in terms of improving the quality of care. Guidelines often show improvements with respect to the process and structure of care. As the effects of guidelines vary largely between recommendations, focusing on recommendations rather than guidelines as a whole is advocated in analyzing barriers well as in designing interventions to improve adherence. In order to draw firm conclusions on the effects of guidelines on patient outcomes, more high-quality studies are needed focusing on the level of the recommendations.

With respect to the barriers that physicians perceive in adhering to current guidelines, we concluded that a wide range of barriers contribute to the gap between the availability of a wide range of guidelines and their limited uptake in practice. The most perceived barriers among GPs were lack of applicability and patient factors, indicating that GPs believe that current guidelines do not always adequately incorporate patients' preferences, abilities and needs. Although we found that dermatologists perceive similar barriers related to patient factors and the user friendliness of guidelines, this dissertation does not allow us to draw firm conclusions on the perceived barriers in specialist care. Aside from barriers that are widely applicable across recommendations in guidelines, many barriers apply (e.g. lack of self-efficacy, lack of time, organisational constraints) to certain recommendations in guidelines only. The perceived barriers among physicians vary largely between recommendations and the unique patterns of barriers that recommendations elicit need to be addressed to improve adherence.

With respect to the third research objective we concluded that GPs have very practical and concrete ideas and clear preferences for interventions to improve guideline adherence. The most preferred interventions among GPs were interactive small group educational meetings and audit and feedback. We also found that some interventions received either high or low ratings across recommendations, while other interventions were only valued for improving adherence to some recommendations. Hence, key recommendations do not only elicit varying patterns of barriers, but also varying patterns of preferred interventions. As acceptance by the target group is crucial for

successful implementation, it seems useful to take these preferences into account when developing plans for guideline implementation.

Based on these findings we formulated several **implications** for guideline development, implementation, clinical practice, policy makers and future research.

To increase guideline use it is important for *guideline developers* to try to improve the applicability of guidelines. Although it is not feasible to create guidelines for each and every single combination of diseases, guidelines could be more explicit about the applicability of their recommendations to patients with the most prevalent combinations. To further optimize the applicability of guidelines, patient involvement in the process of guideline development as well as in the actual decision making may be useful. Guidelines could be adapted to facilitate the integration of individual patients' preferences in clinical decision making. Additionally, tools such as decision aids to support the flexible use of guidelines to individual patients in practice could be helpful.

For *guideline implementation*, a detailed analysis of barriers as well as preferred interventions among the target group at the level of the recommendations is suggested. Guideline recommendations share barriers and useful interventions, but also show unique patterns. An in-depth analysis of perceived barriers and preferred interventions can provide detailed information on how to improve guideline adherence. This should replace the tendency for the selection of interventions to be driven by researchers' preferences of and familiarity with types of interventions.

For physicians using guidelines for patients with multiple diseases in *clinical practice* it is important to realise that guideline recommendation are based on the 'average' patient and that recommendations are often based on limited evidence of selected patient populations. Nevertheless, guidelines can help in weighing pros and cons in the decision making process, for patients with multiple diseases as well. Discussion of the guideline and its recommendations in peer groups may be useful, particularly if they enable participants to discuss the content of the recommendations and how to deal with them in practice.

Policy makers are increasingly interested in guidelines as a basis for coverage and reimbursement decisions. However, caution is required with linking financial fees and incentives to adhering to recommendations in guidelines by individual physicians. In some cases, deviating from guidelines is desirable and even required and we have shown in this thesis that physicians often deviate from guideline recommendations by adjusting practice to the patients' individual characteristics such as comorbidity. Financial programmes should therefore be introduced only cautiously; only if they are able to adequately address differences in case-mix, comorbidity and patient preferences, they will not pose a threat to quality of care.

In most studies described in this thesis we used a bottom-up approach, by focusing on key recommendations in guidelines and by involving the target group in each phase of the project. *Future research* is needed to test the effectiveness of involving the target group in guideline implementation. In addition, a follow-up study using a larger sample of recommendations is needed to determine the exact relationship between the type of recommendations and the perceived barriers and useful interventions. Finally, for guideline recommendations to be more applicable and relevant to clinical practice, it is recommended that future clinical trials also include patients with comorbid conditions, at least for the most common combination of diseases. This would provide the evidence base that guideline developers need to improve the applicability of guidelines.

A grayscale photograph of a person from the waist down, walking on a paved path. The person is wearing a patterned skirt, light-colored trousers, and white high-heeled shoes. A large, dark, rectangular bag is slung over their shoulder, and it is overflowing with various boxes of medicine. Some of the visible boxes are labeled 'OR', 'RETARDON', 'Dmg', 'Daurolon', and 'Josacine 50'. The path is a light-colored concrete or stone strip running through a darker asphalt road. The background shows some trees and foliage.

Samenvatting (Summary in Dutch)

Klinische richtlijnen zijn systematisch ontwikkelde aanbevelingen over gepaste zorg in specifieke klinische omstandigheden, ter ondersteuning van de besluitvorming van professionals en patiënten in de zorg. Door het vertalen van het best beschikbare wetenschappelijke bewijs naar specifieke aanbevelingen voor de praktijk, kunnen richtlijnen de implementatie van nieuwe onderzoeksresultaten en inzichten in de klinische praktijk faciliteren. Om deze reden worden ze vaak beschouwd als bruikbare hulpmiddelen om de kwaliteit van zorg te verbeteren.

In de laatste dertig jaar zijn er tal van *evidence-based* richtlijnen ontwikkeld voor een breed scala aan ziekten en aandoeningen binnen vrijwel alle gebieden van de gezondheidszorg. Daarnaast is er veel geïnvesteerd in het implementeren van richtlijnen in de praktijk. Ondanks de grote verspreiding en promotie van het gebruik van klinische richtlijnen, hebben richtlijnen vaak maar een matig effect op de klinische praktijk. Zowel nationale als internationale studies laten zien dat de toepassing van richtlijnen door artsen verre van optimaal is en dat de mate van toepassing sterk varieert tussen zorgverleners, praktijken en ziekenhuizen. Kortom, er is sprake van een kloof tussen theorie en praktijk.

Het voornaamste doel van dit proefschrift - de GAP-studie (*Guideline Adherence in Practice*) - was om kennis te genereren over de kloof tussen enerzijds het beschikbaar zijn van een breed scala aan klinische richtlijnen en anderzijds het beperkte gebruik ervan in de klinische praktijk en om aanbevelingen te geven over hoe deze kloof overbrugd kan worden. De volgende specifieke onderzoeksdoelen werden geformuleerd:

1. Het vaststellen van de effecten van richtlijnen op de kwaliteit van zorg met betrekking tot structuur, processen en uitkomsten van de zorg.
2. Het identificeren van de barrières die artsen (huisartsen, specialisten) ervaren met betrekking tot het volgen van richtlijnen in de praktijk.
3. Het verkennen van geschikte en algemeen geaccepteerde implementatiestrategieën bij artsen uit de doelgroep, die deze barrières aanpakken, om zo de toepassing van richtlijnen in de praktijk te bevorderen.

Een combinatie van zowel kwalitatieve als kwantitatieve onderzoeksmethoden is gebruikt om de onderzoeksdoelen van dit proefschrift te onderzoeken. Deze omvatte een systematische literatuurstudie, een kwalitatieve focusgroepstudie, twee kwantitatieve, cross-sectionele vragenlijstonderzoeken en een systematische analyse van richtlijnen. In tegenstelling tot de meeste andere onderzoeken richt de GAP-studie zich op het niveau van de kernaanbevelingen in plaats van op richtlijnen als geheel. Dit gold zowel voor het identificeren van barrières als voor het identificeren van strategieën om deze barrières aan te pakken. Bovendien streefden we naar actieve betrokkenheid van de doelgroep in het formuleren van strategieën om de toepassing van richtlijnen in de praktijk te bevorderen, in plaats van een *top-down* aanpak te hanteren.

In **Hoofdstuk 2** beschreven we een systematische literatuurstudie naar de effecten van *evidence-based* richtlijnen op de kwaliteit van zorg in Nederland. Hoewel er sinds de jaren '90 veel geïnvesteerd is in het ontwikkelen en implementeren van *evidence-based* richtlijnen in Nederland, waren er tot dusver nog geen reviews uitgevoerd naar hun effectiviteit. Daarom analyseerden we studies die de effecten van Nederlandse *evidence-based* richtlijnen op zowel het proces en de structuur van de zorg als op patiëntuitkomsten meenamen. Naar voren kwam dat Nederlandse *evidence-based* richtlijnen effectief kunnen zijn wat betreft het verbeteren van de kwaliteit van zorg. Het merendeel van de studies rapporteerde verbeteringen in het proces en de structuur van de zorg als gevolg van richtlijnen. De effecten van richtlijnen op patiëntuitkomsten werden ook gevonden, hoewel deze veel minder werden gemeten en de resultaten minder overtuigend waren. De resultaten lieten ook zien dat de effecten van richtlijnen in sterke mate varieerden tussen de verschillende aanbevelingen. Dit impliceert dat het inderdaad zinvoller is om ons te richten op het niveau van individuele aanbevelingen in plaats van op richtlijnen als geheel, zowel bij het analyseren van barrières als bij het ontwerpen van strategieën om richtlijntoepassing te bevorderen.

Hoofdstuk 3 onderzocht de barrières die Nederlandse huisartsen ervaren bij het toepassen van een diverse set van klinische richtlijnen voor de huisartsgeneeskunde (zg. NHG-standaarden). Aangezien verschillende aanbevelingen binnen richtlijnen verschillende barrières met zich mee kunnen brengen, richtten we ons in deze studie

op de kernaanbevelingen. Door het uitvoeren van zes kwalitatieve focusgroepsessies, waarin twaalf nationale NHG-standaarden en 56 kernaanbevelingen werden bediscussieerd, kregen we een overzicht van de barrières die huisartsen ervaren in het toepassen van aanbevelingen uit richtlijnen in de praktijk. Nederlandse huisartsen bleken in de praktijk een breed scala aan barrières waar te nemen met betrekking tot het volgen van aanbevelingen uit richtlijnen. De drie meest prominente barrières die toepasbaar waren op veel aanbevelingen waren 1. Het oneens zijn met de aanbevelingen vanwege een gebrek aan toepasbaarheid of gebrek aan bewijs. 2. Omgevingsfactoren, zoals organisatorische belemmeringen die het toepassen van aanbevelingen bemoeilijken en 3. Een gebrek aan kennis met betrekking tot de aanbevelingen. Ook kwam naar voren dat de waargenomen barrières sterk varieerden binnen richtlijnen en dat elke kernaanbeveling een specifiek patroon van barrières kende. Op basis hiervan concludeerden we dat op maat gemaakte, barrièregepaste strategieën nodig zijn om het gebruik van richtlijnen in de praktijk te bevorderen.

Hoofdstuk 4 presenteerde de bevindingen aangaande één van de NHG-standaarden van de focusgroepstudie in meer detail, namelijk de NHG-standaard over (ongecompliceerde) urineweginfecties (UWI). Waar de studie die werd gepresenteerd in Hoofdstuk 3 een overzicht gaf van barrières die huisartsen waarnemen in het toepassen van een diverse set van richtlijnen, gaven we in dit hoofdstuk een gedetailleerd inzicht in de waargenomen barrières en zinvolle strategieën om deze barrières aan te pakken voor een specifieke richtlijn. Het bleek dat het oneens zijn met de aanbevelingen onder andere vanwege een gebrek aan toepasbaarheid, het ontbreken van materialen en apparatuur en organisatorische belemmeringen barrières vormden voor de aanbevelingen op het gebied van diagnostiek. Barrières ten aanzien van het volgen van de behandelingsaanbevelingen betroffen eveneens een gebrek aan toepasbaarheid en organisatorische belemmeringen gerelateerd aan het beschikbaar zijn van medicatie in apotheken. Voorgestelde strategieën waren kleinschalige educatie voor huisartsen en andere praktijkmedewerkers, het verbeteren van de organisatie en coördinatie van zorg in diensten buiten kantooruren, het verbeteren van de beschikbaarheid van gewenste doseringen van medicatie en het regionaal pilot-testen van richtlijnen. Ook liet deze studie zien dat huisartsen praktische en concrete ideeën hebben over strategieën om het

gebruik van richtlijnen in de praktijk te bevorderen welke niet altijd de meest voordehandliggende zijn. We concludeerden dat het betrekken van de doelgroep in het selecteren van bruikbare en geaccepteerde strategieën om aanbevelingen uit richtlijnen beter te implementeren, de haalbaarheid en het succes ervan kan vergroten.

Hoofdstuk 5 rapporteerde over de ervaren barrières bij het volgen van richtlijnen in de specialistische zorg. Op basis van een cross-sectioneel vragenlijstonderzoek onder Nederlandse dermatologen werden in dit hoofdstuk de kennisgerelateerde, attitudegerelateerde en externe barrières ten aanzien van het volgen van de richtlijnen voor de behandeling van matige tot ernstige plaque psoriasis beschreven. Deze studie liet zien dat Nederlandse dermatologen over het algemeen op de hoogte waren van het bestaan en de inhoud van de psoriasisrichtlijnen, een positieve houding hebben ten aanzien van deze richtlijnen en weinig praktische en organisatorische belemmeringen ervaren bij het volgen van deze richtlijnen in de praktijk. Wel stelde een deel van de dermatologen vraagtekens bij de communicatiebevorderende aspecten van de psoriasisrichtlijnen en de gebruiksvriendelijkheid. Ook vond een deel van de dermatologen dat de richtlijnen te weinig rekening houden met de wensen van patiënten.

Hoofdstuk 6 ging verder in op een belangrijke barrière bij het volgen van richtlijnen, namelijk gebrek aan toepasbaarheid door comorbiditeit bij patiënten. Door het systematisch bestuderen van de inhoud van een internationale set van *evidence-based* richtlijnen voor vier veelvoorkomende chronische aandoeningen (COPD, depressieve stoornis, diabetes mellitus 2, osteoartritis) wilden we nagaan in welke mate de huidige richtlijnen toepasbaar zijn op patiënten met comorbide aandoeningen. Onze richtlijnstudie bracht aan het licht dat de toepasbaarheid van de huidige *evidence-based* richtlijnen op patiënten met comorbiditeit beperkt is. De meeste richtlijnen bieden geen expliciete leidraad voor wat betreft de behandeling van patiënten met comorbiditeit, met name als het gaat om discordante combinaties. Ook vonden we dat het bewijs waarop de comorbiditeitsgerelateerde aanbevelingen zijn gebaseerd vaak beperkt was en van slechte kwaliteit en niet altijd op een adequate wijze was vertaald in de richtlijnen. We concludeerden dat, in het licht van het algehele gebrek aan bewijs voor patiënten met comorbiditeit, richtlijnen explicieter zouden moeten zijn ten aanzien van de toepas-

baarheid van hun aanbevelingen en onderliggende bewijs voor patiënten met comorbiditeit. Ook is er behoefte aan meer bewijs uit onderzoek voor wat betreft de optimale behandeling van patiënten met de meest voorkomende combinaties van chronische aandoeningen.

Hoofdstuk 7 richtte zich wederom op de barrières die Nederlandse huisartsen ervaren bij de toepassing van richtlijnen en vult daarmee de bevindingen uit de focusgroepstudie aan. Waar de ervaren barrières in Hoofdstuk 3 kwalitatief werden onderzocht, werden de resultaten in dit hoofdstuk gekwantificeerd door de relevantie van elk van de barrières te beschrijven. Naast barrières, werden de toepassing van de specifieke aanbevelingen en de houding ten aanzien van de NHG-standaarden in het algemeen meegenomen. De resultaten van de survey lieten zien dat Nederlandse huisartsen over het algemeen een positieve houding hebben ten aanzien van de NHG-standaarden en een hoge mate van opvolging van de aanbevelingen alsmede een lage mate van ervaren barrières rapporteren. Echter, de toepassingsscores en ervaren barrières varieerden sterk tussen de aanbevelingen. De meest ervaren barrières - die toepasbaar waren op veel aanbevelingen - waren patiëntgerelateerd (gebrek aan toepasbaarheid op patiënten en patiëntfactoren), hetgeen erop wijst dat de huidige richtlijnen niet altijd adequaat de wensen, voorkeuren, behoeften en mogelijkheden van patiënten incorporeren. Veel andere typen barrières (bijv. factoren gerelateerd aan de aanbevelingen zelf, gebrek aan tijd, en organisatorische belemmeringen) waren slechts van toepassing op sommige aanbevelingen, waarmee het belang van het richten op aanbevelingen in plaats van richtlijnen als geheel nogmaals werd benadrukt.

Hoofdstuk 8 richtte zich op de voorkeuren van huisartsen ten aanzien van implementatiestrategieën om het gebruik van richtlijnen in de praktijk te bevorderen en ging na of deze voorkeuren ook verschil lieten zien tussen de aanbevelingen in richtlijnen. Door middel van een vragenlijstonderzoek onder 264 Nederlandse huisartsen lieten we zien dat huisartsen de voorkeur geven aan interactieve kleinschalige educatieve bijeenkomsten alsook aan toetsing en terugkoppeling (*audit & feedback*) als methoden om de toepassing van richtlijnen in het algemeen te bevorderen. Financiële interventies, het slechts verspreiden van educatief materiaal, evenals grootschalige

educatieve bijeenkomsten werden het minst gewaardeerd door de huisartsen. Bovendien vonden we dat bepaalde strategieën werden geprefereerd door huisartsen ongeacht het onderwerp van de richtlijn en haar aanbevelingen (educatieve bijeenkomsten, *audit & feedback*), terwijl de scores voor andere strategieën meer verschil lieten zien tussen de aanbevelingen (bijv. reminders en computerondersteuning, patiëntgerichte interventies en bepaalde organisatorische interventies). Ofwel, verschillende aanbevelingen uit richtlijnen roepen niet alleen verschillende patronen van barrières op, maar ook verschillende patronen van implementatiestrategieën waaraan huisartsen de voorkeur geven. Aangezien acceptatie door de doelgroep cruciaal is voor succesvolle implementatie lijkt het zinvol om, naast de specifieke barrières, ook deze voorkeuren mee te nemen in de ontwikkeling van plannen voor richtlijnimplementatie.

In **Hoofdstuk 9** ten slotte, werden de belangrijkste bevindingen van dit proefschrift samengevat en bediscussieerd, gevolgd door de methodologische overwegingen van onze studie en de implicaties van onze bevindingen voor richtlijnontwikkeling, implementatie, de klinische praktijk, beleidsmakers en toekomstig onderzoek. De volgende conclusies met betrekking tot de drie onderzoeksdoelen waren de voornaamste:

Met betrekking tot het eerste onderzoeksdoel concludeerden we dat *evidence-based* richtlijnen wel degelijk effectief kunnen zijn in het bevorderen van de kwaliteit van zorg. Richtlijnen leiden vaak tot verbeteringen in het proces en de structuur van de zorg. Om ook harde conclusies te kunnen trekken over de effecten van richtlijnen op patiëntuitkomsten, zijn echter meer goede studies nodig die zich richten op het niveau van de aanbevelingen. Gezien de grote variatie in effecten tussen aanbevelingen in richtlijnen, lijkt het zinvol om zich te richten op aanbevelingen in plaats van richtlijnen als geheel, zowel in het analyseren van barrières als in het ontwikkelen van strategieën om het gebruik van richtlijnen te bevorderen.

Voor wat betreft de barrières die artsen ervaren bij het gebruik van de huidige klinische richtlijnen in de praktijk, concludeerden we dat een breed scala aan barrières bijdraagt aan de kloof tussen theorie en praktijk. De voornaamste barrières die huisartsen

ervaren zijn een gebrek aan toepasbaarheid van de aanbevelingen en factoren gerelateerd aan de patiënt, hetgeen erop wijst dat huisartsen van mening zijn dat de huidige richtlijnen de wensen, voorkeuren, mogelijkheden en behoeften van patiënten niet altijd voldoende incorporeren. Hoewel we vonden dat dermatologen vergelijkbare barrières op het gebied van patiëntfactoren ervaren, stelt dit proefschrift ons niet in staat om harde conclusies te trekken ten aanzien van de ervaren barrières onder specialisten. Naast de barrières die breed toepasbaar waren binnen aanbevelingen in richtlijnen, gold voor veel barrières (bijv. gebrek aan tijd, organisatorische belemmeringen) dat ze slechts van toepassing waren op sommige aanbevelingen uit richtlijnen. De ervaren barrières varieerden sterk tussen de verschillende aanbevelingen en de specifieke patronen van barrières die aanbevelingen oproepen moeten worden aangepakt om het gebruik van richtlijnen te bevorderen.

Met betrekking tot het derde onderzoeksdoel concludeerden we dat huisartsen vaak praktische en concrete ideeën en duidelijke voorkeuren hebben op het gebied van implementatiestrategieën om het gebruik van richtlijnen te bevorderen. De meest geprefereerde strategieën onder huisartsen waren interactieve kleinschalige nascholingsbijeenkomsten en toetsing en terugkoppeling (*audit and feedback*). Ook vonden we dat sommige strategieën hoog dan wel laag scoorden op vrijwel alle aanbevelingen, terwijl andere strategieën alleen gewaardeerd werden voor het bevorderen van richtlijntoepassing voor sommige aanbevelingen. Ofwel, aanbevelingen in richtlijnen roepen niet alleen verschillende patronen van barrières op, maar ook verschillende patronen van geprefereerde interventies. Aangezien acceptatie door de doelgroep cruciaal is voor een succesvolle implementatie, lijkt het zinvol om, naast barrières, ook deze voorkeuren mee te nemen bij het ontwikkelen van strategieën voor richtlijnimplementatie.

Op basis van deze bevindingen hebben we verschillende implicaties geformuleerd voor richtlijnontwikkeling, implementatie, de klinische praktijk, beleidsmakers en toekomstig onderzoek.

Om het gebruik van richtlijnen te bevorderen is het van belang dat *richtlijnontwikkelaars* proberen om de toepasbaarheid van richtlijnen te verbeteren. Hoewel het niet haalbaar is om richtlijnen te creëren voor elke mogelijke combinatie van ziekten, zouden richtlijnen explicieter kunnen zijn over de toepasbaarheid van hun aanbevelingen op patiënten met de meest voorkomende combinaties van ziekten. Om de toepasbaarheid van richtlijnen verder te optimaliseren kan het zinvol zijn om patiënten meer te betrekken in zowel het proces van richtlijnontwikkeling als in het feitelijke besluitvormingsproces. Richtlijnen zouden zo aangepast kunnen worden dat de wensen van individuele patiënten beter geïntegreerd worden in de klinische besluitvorming. Daarnaast zouden instrumenten, zoals besluitvormingshulpmiddelen (*decision aids*), die het flexibele gebruik van richtlijnen voor individuele patiënten in de praktijk ondersteunen, zinvol kunnen zijn.

Om richtlijnen te implementeren wordt zowel een gedetailleerde analyse van barrières als van strategieën die de doelgroep prefereren op aanbevelingsniveau aangeraden. Aanbevelingen in richtlijnen hebben barrières met elkaar gemeen, maar laten daarnaast ook unieke barrières zien en voorkeuren voor strategieën om deze barrières weg te nemen. Een diepte-onderzoek naar waargenomen barrières en voorkeuren voor implementatiestrategieën onder de doelgroep kan gedetailleerde informatie opleveren met betrekking tot het bevorderen van de toepassing van richtlijnen in de praktijk. Dit zou de bestaande neiging, waarin de keuze voor implementatiestrategieën veelal wordt geleid door voorkeuren van de onderzoekers en hun bekendheid met bepaalde strategieën, moeten vervangen.

Voor artsen die in de *klinische praktijk* gebruik maken van richtlijnen bij patiënten met meerdere ziekten tegelijk, is het belangrijk om zich te realiseren dat aanbevelingen in richtlijnen gebaseerd zijn op de ‘gemiddelde’ patiënt en dat de aanbevelingen vaak gebaseerd zijn op beperkt bewijs van geselecteerde patiëntpopulaties. Desalniettemin kunnen richtlijnen die gericht zijn op één ziekte, helpen in het afwegen van de voors en tegens in het besluitvormingsproces, ook voor patiënten met meerdere ziekten. Het bespreken van richtlijnen in *peer groups* kan eveneens zinvol zijn, met name wanneer

deze *peer groups* de deelnemers de gelegenheid bieden om de inhoud van de aanbevelingen en de toepassing hiervan in de praktijk te bediscussiëren.

Beleidsmakers zijn in toenemende mate geïnteresseerd in richtlijnen als basis voor beslissingen aangaande dekkingen en vergoedingen. Echter, voorzichtigheid is geboden met het koppelen van financiële vergoedingen en prikkels aan het volgen van aanbevelingen in de praktijk voor individuele patiënten. In sommige gevallen is het afwijken van richtlijnen gewenst of zelfs noodzakelijk. We hebben in dit proefschrift laten zien dat artsen vaak afwijken van aanbevelingen in richtlijnen door de praktijk aan te passen aan de specifieke kenmerken van individuele patiënten zoals comorbiditeit. Financiële interventies moeten daarom met voorzichtigheid worden ingevoerd; alleen wanneer ze in staat zijn om voldoende rekening te houden met verschillen in case-mix, comorbiditeit en patiëntvoorkeuren, zullen ze geen bedreiging vormen voor de kwaliteit van zorg.

In het grootste deel van de studies die zijn beschreven in dit proefschrift hebben we gebruik gemaakt van een *bottom-up* benadering, door ons te richten op kernaanbevelingen in richtlijnen en door het betrekken van de doelgroep in iedere fase van het project. Toekomstig onderzoek is nodig om de effectiviteit van het betrekken van de doelgroep in richtlijnimplementatie aan te tonen. Daarnaast is een vervolgstudie, die gebruik maakt van een grotere verzameling van aanbevelingen, nodig om de exacte relatie tussen het type aanbeveling en de waargenomen barrières en bruikbare implementatiestrategieën te bepalen. Tot slot wordt aangeraden, in ieder geval voor de meest voorkomende combinaties van ziekten, in toekomstige klinische trials ook patiënten met meerdere ziekten en aandoeningen tegelijk te betrekken. Dit zou de *evidence base* leveren die richtlijnmakers nodig hebben om de toepasbaarheid en relevantie van richtlijnen in de praktijk te kunnen bevorderen.



Appendix A:

**Vragenlijst naar barrières bij de toepassing van richtlijnen
en strategieën voor verbetering**



GAP
GUIDELINE
ADHERENCE
IN PRACTICE

- VRAGENLIJST 1 -

NHG-standaard het Rode Oog

Lugtenberg M, Burgers JS, Westert GP, TRANZO, Universiteit van Tilburg, 2010

DEEL 1: Achtergrondkenmerken

1. Wat is uw geslacht?
 - Man
 - Vrouw
2. Wat is uw geboortedatum (dd/mm/jjj)?
...../...../.....
3. Aan welke universiteit bent u afgestudeerd?
 - Amsterdam (UVA)
 - Amsterdam (VU)
 - Groningen
 - Leiden
 - Maastricht
 - Nijmegen
 - Rotterdam
 - Utrecht
 - Elders, namelijk
 - Ik ben nog in opleiding (*ga door naar vraag 6*)
4. In welk jaar heeft u uw opleiding tot huisarts afgerond?
19/20
5. Bent op u op dit moment werkzaam als huisarts?
 - Ja
 - Nee (*u behoort niet tot de doelgroep van deze vragenlijst en kunt stoppen*)
6. In welke hoedanigheid bent u werkzaam als huisarts (*meerdere antwoorden mogelijk*)?
 - Zelfstandig gevestigd huisarts
 - HIDHA
 - Waarnemer
 - HAIO
 - Anders, namelijk:
7. Hoe lang bent u reeds werkzaam als HAIO/huisarts?
..... jaar
8. Hoeveel uur per week bent u werkzaam als HAIO/huisarts?
..... uur per week
9. In wat voor type praktijk bent u werkzaam (*meerdere antwoorden mogelijk*)?
 - Solopraktijk
 - Duopraktijk
 - Groepspraktijk/Gezondheidscentrum
10. Hoeveel huisartsen (inclusief uzelf) en ondersteunend personeel zijn in uw praktijk werkzaam?
 - huisarts(en), voor in totaal Fte
 - praktijkassistent(en), voor in totaal Fte
 - praktijkondersteuner(s), voor in totaal Fte
11. Kunt u een schatting geven van het totale aantal ingeschreven patiënten in uw praktijk?
.....

12. Wat is de postcode van de praktijk/ het gezondheidscentrum waarin u werkzaam bent?

.....

13. Heeft u deelgenomen aan één of meerdere focusgroepen in het kader van de GAP-studie (*meerdere antwoorden mogelijk*)?

- Ja, aan de pilot-focusgroep (Urineweginfectie & Astma bij kinderen; 5 maart 2008)
- Ja, aan focusgroep 2 (Atriumfibrilleren & het SOA-consult; 8 april 2008)
- Ja, aan focusgroep 3 (Schildklierandoeningen & Slaapmiddelen; 15 april 2008)
- Ja, aan focusgroep 4 (CVA & het Rode oog; 17 april 2008)
- Ja, aan focusgroep 5 (CVRM & Rhinosinusitis; 24 april 2008)
- Ja, aan focusgroep 6 (Depressieve stoornis & TIA; 13 mei 2008)
- Nee

DEEL 2: De NHG-standaarden en ondersteuning

Het NHG heeft inmiddels meer dan 80 NHG-standaarden ontwikkeld die huisartsen kunnen toepassen in de praktijk. Ook is er veel geïnvesteerd in het implementeren van richtlijnen in de praktijk, onder andere in de vorm van nascholing. In dit deel van de vragenlijst vragen wij uw mening over de NHG-standaarden en verschillende vormen van nascholing en andere ondersteuning voor het toepassen van standaarden.

NHG en NHG-standaarden

14. Hieronder volgt een aantal stellingen over NHG-standaarden. Geef voor onderstaande stellingen aan in hoeverre u het hiermee eens bent door het antwoord te kiezen dat het meest van toepassing is.

1	2	3	4	5
Helemaal mee oneens	Enigszins mee oneens	Eens noch oneens	Enigszins mee eens	Helemaal mee eens

Ik vind NHG-standaarden waardevolle bronnen van advies	1	2	3	4	5
Ik vind dat NHG-standaarden een goede wetenschappelijke onderbouwing hebben	1	2	3	4	5
Ik vind dat het gebruik van NHG-standaarden de kwaliteit van de patiëntenzorg verbetert	1	2	3	4	5
Ik mis kennis en/of vaardigheden om de NHG standaarden goed toe te kunnen passen	1	2	3	4	5
Ik heb moeite met het veranderen van mijn bestaande routines voor het toepassen van NHG-standaarden	1	2	3	4	5
Ik maak in de praktijk veelvuldig gebruik van de NHG-standaarden	1	2	3	4	5
Ik heb in het algemeen weerstand tegen werken volgens de NHG-standaarden	1	2	3	4	5

Nascholing en ondersteuning

15. Hieronder staat een aantal vormen van nascholing en ondersteuning genoemd. Kunt u aangeven in hoeverre deze activiteiten u zouden stimuleren om NHG-standaarden in het algemeen meer te gaan volgen door het antwoord te kiezen dat het meest van toepassing is?

	1	2	3	4	5
	Helemaal niet	Weinig	Enigszins	Veel	Zeer veel
Toesturen van educatief materiaal (bijv. nascholingsartikelen, samenvatting van wetenschappelijk onderzoek)	1	2	3	4	5
Individuele nascholing (bijv. PIN of E-learning)	1	2	3	4	5
Kleinschalige, interactieve nascholingsbijeenkomsten (bespreking van de standaard in HAGRO, FTO- of toetsgroep)	1	2	3	4	5
Grootschalige nascholingsbijeenkomsten met passieve participatie (bijv. conferenties, lezingen)	1	2	3	4	5
Regionale nascholingsbijeenkomsten via de regionale ondersteuningsstructuur KOEL	1	2	3	4	5
Regionale nascholingsbijeenkomsten via de regionale ziekenhuizen (klinische lessen)	1	2	3	4	5
Scholingsbijeenkomsten met actieve participatie in andere groepsvormen <u>zonder</u> bemoeienis van sponsoren	1	2	3	4	5
Scholingsbijeenkomsten met actieve participatie in andere groepsvormen <u>met</u> bemoeienis van sponsoren	1	2	3	4	5
Inzet van collega-huisartsen met speciale expertise	1	2	3	4	5
Praktijkbezoeken van een getraind persoon die contact heeft met zorgverleners in de praktijk om informatie (bijv. feedback) te verstrekken en te assisteren bij de implementatie	1	2	3	4	5
Evaluatie en terugkoppeling van eigen handelen, in vergelijking tot andere collega's	1	2	3	4	5
Computerondersteuning (Decision support systemen, EVS of andere 'reminders')	1	2	3	4	5
Het aanpassen van de NHG-standaarden zelf (bijv. duidelijker formuleren of updaten)	1	2	3	4	5
Voorlichtingsmateriaal voor patiënten of publiekscampagnes	1	2	3	4	5
Organisatorische maatregelen (bijv. het ontwikkelen van protocollen of het maken van werkafspraken met praktijkondersteuners en -assistenten of andere zorgverleners buiten de praktijk)	1	2	3	4	5
Financiële prikkels door kostenvergoeding of beloning bij gebleken navolging van de aanbeveling ('pay for performance')	1	2	3	4	5

DEEL 3: De NHG-standaard het Rode Oog

In dit deel van de vragenlijst wordt ingegaan op de NHG-standaard het Rode Oog. In deze standaard zijn 3 kernaanbevelingen geformuleerd, die de kern van de standaard omvatten. Per kernaanbeveling volgt een serie stellingen over de kennis en inhoud van de aanbeveling, de toepasbaarheid en naleving van de aanbeveling en patiënt- en omgevingsfactoren die van invloed zijn op het toepassen van de aanbeveling. Ten slotte wordt per kernaanbeveling gevraagd welke vormen van nascholing en ondersteuning de toepassing van de aanbeveling in de praktijk zouden kunnen bevorderen. Leest u de kernaanbeveling telkens goed voordat u antwoord geeft.

KERNAANBEVELING 1

Bij een rood oog gepaard gaande met **pijn, daling van het gezichtsvermogen of lichtschuwheid** (indien niet veroorzaakt door keratoconjunctivitis fotoelectrica, corpus alienum of ander trauma), wordt de **visus bepaald, de pupillen en pupilreacties beoordeeld** en nader **onderzoek van de cornea** verricht met behulp van **fluoresceïnekleuring**.

Kennis en inhoud

16. Hieronder volgt een aantal stellingen over uw kennis van en mening over de inhoud van de aanbeveling. Geef voor onderstaande stellingen aan in hoeverre u het hiermee eens bent door het antwoord te kiezen dat het meest van toepassing is.

	1	2	3	4	5
	Helemaal mee oneens	Enigszins mee oneens	Eens noch oneens	Enigszins mee eens	Helemaal mee eens
Ik ben op de hoogte van het bestaan van deze aanbeveling	1	2	3	4	5
Ik ben het eens met de inhoud van de aanbeveling	1	2	3	4	5
Ik denk dat bepaalde onderdelen van deze aanbeveling onjuist zijn	1	2	3	4	5
Het is mij niet duidelijk waarom ik deze aanbeveling moet volgen	1	2	3	4	5
Ik vind deze aanbeveling helder en begrijpelijk	1	2	3	4	5
Ik vind dat deze aanbeveling verouderd is en moet worden herzien	1	2	3	4	5
Ik vind deze aanbeveling te complex om in de praktijk te volgen	1	2	3	4	5

Toepasbaarheid en naleving

17. Hieronder volgt een aantal stellingen over de toepasbaarheid van de aanbeveling en de mate waarin u deze naleeft. Geef voor onderstaande stellingen aan in hoeverre u het hiermee eens bent door het antwoord te kiezen dat het meest van toepassing is.

1	2	3	4	5
Helemaal mee oneens	Enigszins mee oneens	Eens noch oneens	Enigszins mee eens	Helemaal mee eens

Ik pas deze aanbeveling toe in de praktijk	1	2	3	4	5
Ik vind deze aanbeveling moeilijk toepasbaar in de praktijk	1	2	3	4	5
Ik vind dat deze aanbeveling te weinig rekening houdt met individuele kenmerken van patiënten of specifieke patiëntengroepen (bijv. comorbiditeit)	1	2	3	4	5
Ik denk dat het toepassen van deze aanbeveling leidt tot betere patiëntenzorg	1	2	3	4	5
Ik mis de kennis en/of vaardigheden om deze aanbeveling goed te kunnen toepassen	1	2	3	4	5
Ik heb moeite met het veranderen van mijn bestaande routines voor het toepassen van deze aanbeveling	1	2	3	4	5

Patiënt- en omgevingsfactoren

18. Hieronder volgt een aantal stellingen over factoren op het gebied van de patiënt of de omgeving die van invloed kunnen zijn op het volgen van de aanbeveling. Geef voor onderstaande stellingen aan in hoeverre u het hiermee eens bent door het antwoord te kiezen dat het meest van toepassing is.

1	2	3	4	5	n.v.t.
Helemaal mee oneens	Enigszins mee oneens	Eens noch oneens	Enigszins mee eens	Helemaal mee eens	Niet van toepassing

Deze aanbeveling komt slecht overeen met de wensen en voorkeuren van patiënten	1	2	3	4	5	n.v.t.
Patiënten zijn soms niet in staat om de benodigde handelingen uit te voeren of houden zich niet aan gemaakte afspraken	1	2	3	4	5	n.v.t.
Het toepassen van deze aanbeveling in de praktijk lukt mij niet vanwege de werkdruk en gebrek aan tijd	1	2	3	4	5	n.v.t.
Door gebrek aan (adequate) materialen of apparatuur vind ik het moeilijk te werken volgens deze aanbeveling	1	2	3	4	5	n.v.t.
Organisatorische zaken in mijn eigen praktijk (bijv. openingstijden, locatie, onvoldoende personeel) bemoeilijken het toepassen van deze aanbeveling	1	2	3	4	5	n.v.t.
Vanwege het beleid van andere zorgverleners of partijen (bijv. specialist, ziekenhuis, huisartsenpost, apotheek, laboratorium) vind ik het moeilijk deze aanbeveling toe te passen	1	2	3	4	5	n.v.t.
Gebrek aan communicatie, heldere taakverdeling en/of samenwerking met andere zorgverleners bemoeilijken het toepassen van deze aanbeveling	1	2	3	4	5	n.v.t.
De toepassing van deze aanbeveling brengt kosten met zich mee die voor mij een belemmering zijn	1	2	3	4	5	n.v.t.

Nascholing en ondersteuning

19. Hieronder staat een aantal interventies genoemd. Kunt u aangeven in hoeverre deze activiteiten u zouden stimuleren om deze aanbeveling meer te gaan volgen door het antwoord te kiezen dat het meest van toepassing is?

	1	2	3	4	5
	Helemaal niet	Weinig	Enigszins	Veel	Zeer veel
Educatieve maatregelen ter verkrijging van meer kennis over de inhoud en de wetenschappelijke onderbouwing ('evidence') van de aanbeveling	1	2	3	4	5
Evaluatie en terugkoppeling van eigen handelen, in vergelijking tot andere collega's	1	2	3	4	5
Computerondersteuning (Decision support systemen, EVS of andere 'reminders')	1	2	3	4	5
Het aanpassen van de aanbeveling zelf (bijv. duidelijker formuleren of updaten)	1	2	3	4	5
Voorlichtingsmateriaal voor patiënten of publiekscampagnes	1	2	3	4	5
Uitbreiding van formatie van praktijkondersteuners/ praktijkassistenten	1	2	3	4	5
Nascholing van praktijkondersteuners/ praktijkassistenten	1	2	3	4	5
Het maken van werkafspraken met praktijkondersteuners/ praktijkassistenten	1	2	3	4	5
Ontwikkelen van stappenplan of protocol voor praktijkondersteuners/ praktijkassistenten	1	2	3	4	5
Veranderingen in het praktijkgebouw, faciliteiten en uitrusting	1	2	3	4	5
Organisatorische ondersteuning (bijv. door ROS (KOEL), huisartsenlab of medisch coördinatiecentrum)	1	2	3	4	5
Het maken van afspraken met andere zorgverleners (eerstelijns hulpverleners, specialisten of ziekenhuis)	1	2	3	4	5
Financiële prikkels door kostenvergoeding of beloning bij gebleken navolging van de aanbeveling	1	2	3	4	5

20. Ik zou graag ondersteuning willen hebben bij het beter toepassen van deze aanbeveling in de praktijk
 Ja
 Nee

21. Heeft u nog andere suggesties om de toepassing van deze aanbeveling in de praktijk te bevorderen?

KERNAANBEVELING 2

Bij **diffuse roodheid** en **afwezigheid van jeuk, alarmsymptomen** (pijn, visusdaling of lichtschuwheid) en **cornea-afwijkingen**, is er waarschijnlijk sprake van een **infectieuze conjunctivitis**. Indien de klachten korter dan drie dagen duren of er bestaat niet veel hinder, kan worden afgewacht **zonder antibiotische behandeling**.

Kennis en inhoud

22. Hieronder volgt een aantal stellingen over uw kennis van en mening over de inhoud van de aanbeveling. Geef voor onderstaande stellingen aan in hoeverre u het hiermee eens bent door het antwoord te kiezen dat het meest van toepassing is.

	1	2	3	4	5
	Helemaal mee oneens	Enigszins mee oneens	Eens noch oneens	Enigszins mee eens	Helemaal mee eens
Ik ben op de hoogte van het bestaan van deze aanbeveling	1	2	3	4	5
Ik ben het eens met de inhoud van de aanbeveling	1	2	3	4	5
Ik denk dat bepaalde onderdelen van deze aanbeveling onjuist zijn	1	2	3	4	5
Het is mij niet duidelijk waarom ik deze aanbeveling moet volgen	1	2	3	4	5
Ik vind deze aanbeveling helder en begrijpelijk	1	2	3	4	5
Ik vind dat deze aanbeveling verouderd is en moet worden herzien	1	2	3	4	5
Ik vind deze aanbeveling te complex om in de praktijk te volgen	1	2	3	4	5

Toepasbaarheid en naleving

23. Hieronder volgt een aantal stellingen over de toepasbaarheid van de aanbeveling en de mate waarin u deze naleeft. Geef voor onderstaande stellingen aan in hoeverre u het hiermee eens bent door het antwoord te kiezen dat het meest van toepassing is.

	1	2	3	4	5
	Helemaal mee oneens	Enigszins mee oneens	Eens noch oneens	Enigszins mee eens	Helemaal mee eens
Ik pas deze aanbeveling toe in de praktijk	1	2	3	4	5
Ik vind deze aanbeveling moeilijk toepasbaar in de praktijk	1	2	3	4	5
Ik vind dat deze aanbeveling te weinig rekening houdt met individuele kenmerken van patiënten of specifieke patiëntengroepen (bijv. comorbiditeit)	1	2	3	4	5
Ik denk dat het toepassen van deze aanbeveling leidt tot betere patiëntenzorg	1	2	3	4	5

Ik mis de kennis en/of vaardigheden om deze aanbeveling goed te kunnen toepassen	1	2	3	4	5
Ik heb moeite met het veranderen van mijn bestaande routines voor het toepassen van deze aanbeveling	1	2	3	4	5

Patiënt- en omgevingsfactoren

24. Hieronder volgt een aantal stellingen over factoren op het gebied van de patiënt of de omgeving die van invloed kunnen zijn op het volgen van de aanbeveling. Geef voor onderstaande stellingen aan in hoeverre u het hiermee eens bent door het antwoord te kiezen dat het meest van toepassing is.

1	2	3	4	5	n.v.t.
Helemaal mee oneens	Enigszins mee oneens	Eens noch oneens	Enigszins mee eens	Helemaal mee eens	Niet van toepassing

Deze aanbeveling komt slecht overeen met de wensen en voorkeuren van patiënten	1	2	3	4	5	n.v.t.
Patiënten zijn soms niet in staat om de benodigde handelingen uit te voeren of houden zich niet aan gemaakte afspraken	1	2	3	4	5	n.v.t.
Het toepassen van deze aanbeveling in de praktijk lukt mij niet vanwege de werkdruk en gebrek aan tijd	1	2	3	4	5	n.v.t.
Door gebrek aan (adequate) materialen of apparatuur vind ik het moeilijk te werken volgens deze aanbeveling	1	2	3	4	5	n.v.t.
Organisatorische zaken in mijn eigen praktijk (bijv. openingstijden, locatie, onvoldoende personeel) bemoeilijken het toepassen van deze aanbeveling	1	2	3	4	5	n.v.t.
Vanwege het beleid van andere zorgverleners of partijen (bijv. specialist, ziekenhuis, huisartsenpost, apotheek, laboratorium) vind ik het moeilijk deze aanbeveling toe te passen	1	2	3	4	5	n.v.t.
Gebrek aan communicatie, heldere taakverdeling en/of samenwerking met andere zorgverleners bemoeilijken het toepassen van deze aanbeveling	1	2	3	4	5	n.v.t.
De toepassing van deze aanbeveling brengt kosten met zich mee die voor mij een belemmering zijn	1	2	3	4	5	n.v.t.

Nascholing en ondersteuning

25. Hieronder staat een aantal interventies genoemd. Kunt u aangeven in hoeverre deze activiteiten u zouden stimuleren om deze aanbeveling meer te gaan volgen door het antwoord te kiezen dat het meest van toepassing is?

1	2	3	4	5
Helemaal niet	Weinig	Enigszins	Veel	Zeer veel

Educatieve maatregelen ter verkrijging van meer kennis over de inhoud en de wetenschappelijke onderbouwing ('evidence') van de aanbeveling	1	2	3	4	5
Evaluatie en terugkoppeling van eigen handelen, in vergelijking tot andere collega's	1	2	3	4	5
Computerondersteuning (Decision support systemen, EVS of andere 'reminders')	1	2	3	4	5

Het aanpassen van de aanbeveling zelf (bijv. duidelijker formuleren of updaten)	1	2	3	4	5
Voorlichtingsmateriaal voor patiënten of publiekscampagnes	1	2	3	4	5
Uitbreiding van formatie van praktijkondersteuners/ praktijkassistenten	1	2	3	4	5
Nascholing van praktijkondersteuners/ praktijkassistenten	1	2	3	4	5
Het maken van werkafspraken met praktijkondersteuners/ praktijkassistenten	1	2	3	4	5
Ontwikkelen van stappenplan of protocol voor praktijkondersteuners/ praktijkassistenten	1	2	3	4	5
Veranderingen in het praktijkgebouw, faciliteiten en uitrusting	1	2	3	4	5
Organisatorische ondersteuning (bijv. door ROS (KOEL), huisartsenlab of medisch coördinatiecentrum)	1	2	3	4	5
Het maken van afspraken met andere zorgverleners (eerstelijns hulpverleners, specialisten of ziekenhuis)	1	2	3	4	5
Financiële prikkels door kostenvergoeding of beloning bij gebleken navolging van de aanbeveling	1	2	3	4	5

26. Ik zou graag ondersteuning willen hebben bij het beter toepassen van deze aanbeveling in de praktijk
- Ja
- Nee

27. Heeft u nog andere suggesties om de toepassing van deze aanbeveling in de praktijk te bevorderen?

KERNAANBEVELING 3

Als bij een (vermoedelijk) **bacteriële conjunctivitis** (diffuse roodheid, 's ochtends dichtgeplakte ogen en afwezigheid van jeuk, alarmsymptomen en cornea-afwijkingen) wordt besloten tot **antibiotische behandeling**, gaat de voorkeur uit naar **chlooramfenicol oogzalf 1% 2-4 dd**. Bij een **blefaritis** kan ook **fusidinezuur** worden voorgeschreven, in andere gevallen van conjunctivitis is dit middel niet zinvol gezien de resistentieontwikkeling.

Kennis en inhoud

28. Hieronder volgt een aantal stellingen over uw kennis van en mening over de inhoud van de aanbeveling. Geef voor onderstaande stellingen aan in hoeverre u het hiermee eens bent door het antwoord te kiezen dat het meest van toepassing is.

1	2	3	4	5
Helemaal mee oneens	Enigszins mee oneens	Eens noch oneens	Enigszins mee eens	Helemaal mee eens

Ik ben op de hoogte van het bestaan van deze aanbeveling	1	2	3	4	5
Ik ben het eens met de inhoud van de aanbeveling	1	2	3	4	5
Ik denk dat bepaalde onderdelen van deze aanbeveling onjuist zijn	1	2	3	4	5
Het is mij niet duidelijk waarom ik deze aanbeveling moet volgen	1	2	3	4	5
Ik vind deze aanbeveling helder en begrijpelijk	1	2	3	4	5
Ik vind dat deze aanbeveling verouderd is en moet worden herzien	1	2	3	4	5
Ik vind deze aanbeveling te complex om in de praktijk te volgen	1	2	3	4	5

Toepasbaarheid en naleving

29. Hieronder volgt een aantal stellingen over de toepasbaarheid van de aanbeveling en de mate waarin u deze naleeft. Geef voor onderstaande stellingen aan in hoeverre u het hiermee eens bent door het antwoord te kiezen dat het meest van toepassing is.

1	2	3	4	5
Helemaal mee oneens	Enigszins mee oneens	Eens noch oneens	Enigszins mee eens	Helemaal mee eens

Ik pas deze aanbeveling toe in de praktijk	1	2	3	4	5
Ik vind deze aanbeveling moeilijk toepasbaar in de praktijk	1	2	3	4	5
Ik vind dat deze aanbeveling te weinig rekening houdt met individuele kenmerken van patiënten of specifieke patiëntengroepen (bijv. comorbiditeit)	1	2	3	4	5

Ik denk dat het toepassen van deze aanbeveling leidt tot betere patiëntenzorg	1	2	3	4	5
Ik mis de kennis en/of vaardigheden om deze aanbeveling goed te kunnen toepassen	1	2	3	4	5
Ik heb moeite met het veranderen van mijn bestaande routines voor het toepassen van deze aanbeveling	1	2	3	4	5

Patiënt- en omgevingsfactoren

30. Hieronder volgt een aantal stellingen over factoren op het gebied van de patiënt of de omgeving die van invloed kunnen zijn op het volgen van de aanbeveling. Geef voor onderstaande stellingen aan in hoeverre u het hiermee eens bent door het antwoord te kiezen dat het meest van toepassing is.

1	2	3	4	5	n.v.t.
Helemaal mee oneens	Enigszins mee oneens	Eens noch oneens	Enigszins mee eens	Helemaal mee eens	Niet van toepassing

Deze aanbeveling komt slecht overeen met de wensen en voorkeuren van patiënten	1	2	3	4	5	n.v.t.
Patiënten zijn soms niet in staat om de benodigde handelingen uit te voeren of houden zich niet aan gemaakte afspraken	1	2	3	4	5	n.v.t.
Het toepassen van deze aanbeveling in de praktijk lukt mij niet vanwege de werkdruk en gebrek aan tijd	1	2	3	4	5	n.v.t.
Door gebrek aan (adequate) materialen of apparatuur vind ik het moeilijk te werken volgens deze aanbeveling	1	2	3	4	5	n.v.t.
Organisatorische zaken in mijn eigen praktijk (bijv. openingstijden, locatie, onvoldoende personeel) bemoeilijken het toepassen van deze aanbeveling	1	2	3	4	5	n.v.t.
Vanwege het beleid van andere zorgverleners of partijen (bijv. specialist, ziekenhuis, huisartsenpost, apotheek, laboratorium) vind ik het moeilijk deze aanbeveling toe te passen	1	2	3	4	5	n.v.t.
Gebrek aan communicatie, heldere taakverdeling en/of samenwerking met andere zorgverleners bemoeilijken het toepassen van deze aanbeveling	1	2	3	4	5	n.v.t.
De toepassing van deze aanbeveling brengt kosten met zich mee die voor mij een belemmering zijn	1	2	3	4	5	n.v.t.

Nascholing en ondersteuning

31. Hieronder staat een aantal interventies genoemd. Kunt u aangeven in hoeverre deze activiteiten u zouden stimuleren om deze aanbeveling meer te gaan volgen door het antwoord te kiezen dat het meest van toepassing is?

1	2	3	4	5
Helemaal niet	Weinig	Enigszins	Veel	Zeer veel

Educatieve maatregelen ter verkrijging van meer kennis over de inhoud en de wetenschappelijke onderbouwing ('evidence') van de aanbeveling	1	2	3	4	5
Evaluatie en terugkoppeling van eigen handelen, in vergelijking tot andere collega's	1	2	3	4	5

Computerondersteuning (Decision support systemen, EVS of andere 'reminders')	1	2	3	4	5
Het aanpassen van de aanbeveling zelf (bijv. duidelijker formuleren of updaten)	1	2	3	4	5
Voorlichtingsmateriaal voor patiënten of publiekscampagnes	1	2	3	4	5
Uitbreiding van formatie van praktijkondersteuners/ praktijkassistenten	1	2	3	4	5
Nascholing van praktijkondersteuners/ praktijkassistenten	1	2	3	4	5
Het maken van werkafspraken met praktijkondersteuners/ praktijkassistenten	1	2	3	4	5
Ontwikkelen van stappenplan of protocol voor praktijkondersteuners/ praktijkassistenten	1	2	3	4	5
Veranderingen in het praktijkgebouw, faciliteiten en uitrusting	1	2	3	4	5
Organisatorische ondersteuning (bijv. door ROS (KOEL), huisartsenlab of medisch coördinatiecentrum)	1	2	3	4	5
Het maken van afspraken met andere zorgverleners (eerstelijns hulpverleners, specialisten of ziekenhuis)	1	2	3	4	5
Financiële prikkels door kostenvergoeding of beloning bij gebleken navolging van de aanbeveling	1	2	3	4	5

32. Ik zou graag ondersteuning willen hebben bij het beter toepassen van deze aanbeveling in de praktijk
 Ja
 Nee

33. Heeft u nog andere suggesties om de toepassing van deze aanbeveling in de praktijk te bevorderen?

*******Hartelijk dank voor uw medewerking*******

A grayscale photograph of a person from the waist down, walking on a paved path. The person is wearing a patterned skirt, light-colored trousers, and white high-heeled shoes. They are carrying a large, dark-colored bag or suitcase that is overflowing with various boxes of medicine. Some of the visible medicine boxes include 'OR', 'RETARDON', 'Durolofon', and 'Josacoline 50'. The path is a light-colored concrete or stone strip running through a darker asphalt road. The background shows some trees and foliage.

Dankwoord (Acknowledgement)

Zie hier mijn proefschrift, ik ben er klaar mee! Aangezien je een proefschrift niet alleen schrijft, wil ik dit laatste hoofdstuk graag gebruiken om een aantal mensen te bedanken die mij op verschillende manieren tijdens mijn promotietraject hebben gesteund.

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A person is walking away from the camera on a paved path. They are wearing a patterned dress and white high-heeled shoes. They are carrying a large black bag that is overflowing with various medicine boxes and bottles. The bag is the central focus of the image, and the person's legs and shoes are visible on either side. The background is a blurred outdoor setting with trees and a path.


Curriculum Vitae

Marjolein Lugtenberg (Bilthoven, the Netherlands, 1978) graduated from secondary school at the Montessori Lyceum Herman Jordan in Zeist in 1996. She studied Psychology at Utrecht University. Her master thesis entitled *Interculturalisation and the work-related well-being of ethnic majority and minority employees* was awarded with the David van Lennep Best Thesis Award 2004, a national award for the best thesis in the area of work, occupation, health and organisations.

After obtaining her master degree in Psychology she began working at the Netherlands Institute for Health Services Research (NIVEL) in 2005. Here, she participated in several projects related to primary and specialist health care.

In October 2006 Marjolein started her Ph.D. trajectory at the department of Tranzo at Tilburg University and the National Institute for Public Health and the Environment (RIVM). This project, the GAP study (*Guideline Adherence in Practice*), focused on generating knowledge about the gap between the availability of a wide range of guidelines and their limited uptake in clinical practice, the results of which are presented in this thesis. Between March and July 2009 she had the opportunity to work as a visiting Ph.D. Candidate at the Harvard School of Public Health in Boston, MA, USA.

From June 2011 onwards, Marjolein has been working as a post-doc researcher at IQ Healthcare, University Medical Centre St. Radboud in Nijmegen. In collaboration with her supervisors she wrote a research proposal on the evaluation of a Decision Support System (*NHGDoe*) for general practitioners in the Netherlands, which was granted, and gave her the opportunity to continue her work in this field.

A grayscale photograph of a person from the waist down, wearing a patterned dress and high-heeled shoes. They are carrying a large black bag filled with various medicine boxes, including brands like 'OR', 'RETINOLIN', 'Dermatolone', and 'Josacilin 50'. The person is walking on a paved path with a white line. The text 'List of publications' is overlaid on the image.

List of publications

International peer-reviewed articles

Lugtenberg M, Burgers JS, Westert GP. Guideline adherence in practice: the gap between theory and practice explored. *International Public Health Journal*, In press.

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Van der Sar R, Lugtenberg M. Eén ziekte, één richtlijn. *Tijdschrift voor Gezondheidswetenschappen*, 2011; 89(1):22-23.

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