Characteristics of effective clinical guidelines for general practice

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SUMMARY

Background: *The use of clinical guidelines in general practice is often limited. Research on barriers to guideline adherence usually focuses on attitudinal factors. Factors linked to the guideline itself are much less studied.*

Aim: *To identify characteristics of effective clinical guidelines for general practice, and to explore whether these differ between therapeutic and diagnostic recommendations.*

Design of study: *Analysis of performance data from an audit study of 200 general practitioners (GPs) in The Netherlands conducted in 1997.*

Setting: *Panel of 12 GPs in The Netherlands who were familiar with guideline methodology.*

Method: *A set of 12 attributes, including six potential facilitators and six potential barriers to guideline use, was formulated. The panel assessed the presence of these attributes in 96 guideline recommendations formulated by the Dutch College of General Practitioners. The attributes of recommendations with high compliance rates (70% to 100%) were compared with those with low compliance rates (0% to 60%).*

Results: *Recommendations with high compliance rates were to a lesser extent those requiring new skills (7% compared with 22% in recommendations with low compliance rates), were less often part of a complex decision tree (12% versus 25%), were more compatible with existing norms and values in practice (87% versus 76%), and more often supported with evidence (47% versus 31%). For diagnostic recommendations, the ease of applying them and the potential (negative) reactions of patients were more relevant than for therapeutic recommendations.*

Conclusion: *To bridge the gap between research and practice, the evidence as well as the applicability should be considered when formulating recommendations. If the recommendations are not compatible with existing norms and values, not easy to follow or require new knowledge and skills, appropriate implementation strategies should be designed to ensure change in daily practice.*

Keywords: *guidelines; adherence; primary care.*

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Introduction

WITHIN the past decade considerable time and energy have gone into the development of evidence-based guidelines for improving clinical practice. Unfortunately, not all guidelines actually improve the quality of care.[1] Why are some guidelines successful in changing care and others not? Research on barriers to guideline adherence is often qualitative in nature and focuses on guideline users and their behaviour.[2-5] In contrast, factors linked to the guideline itself are much less studied. Literature on characteristics of effective guidelines is very limited. Rogers suggested that attributes such as relative advantage, compatibility, complexity, triability, and observability may influence the adoption of an innovation.[6] Grilli and Lomas confirmed that the complexity and triability of recommendations could partly predict the level of compliance with a guideline.[7] Based on literature, Grol *et al* extended the number of attributes that might influence the use of guidelines in practice.[8] Their study showed that controversial recommendations, vague and non-specific recommendations, and recommendations that demanded an alteration in existing routines and habits, were less likely to be followed. However, this study was limited in the number of recommendations studied. Further research in this area is necessary to ensure that guidelines are developed in a way that is optimally effective in improving patient care.[9] A better understanding of those aspects of a guideline that make a difference in daily clinical practice may help in setting guidelines and recommendations for practice in a positive way.

In this study, we aimed to identify characteristics of effective guidelines using a large sample of concrete recommendations with contrasting compliance rates. We examined to what extent the attributes of recommendations with high compliance rates differed from those of recommendations with low compliance rates. In addition, we explored differences between diagnostic and therapeutic recommendations.

Method

Clinical guidelines are documents that contain a set of individual recommendations covering one specific disease area. For this study we included recommendations defined as 'systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances'.[10] Effective guidelines are guidelines whose recommendations are actually followed in practice.

Formulation of attributes of recommendations

Based on previous work[8] and supplemented with items derived from other instruments assessing the quality of

HOW THIS FITS IN

What do we know?

General practitioners have a positive attitude towards guidelines but often do not use them in practice. Research on barriers to guideline adherence often focuses on guideline users and their behaviour and not on factors linked to the guideline itself.

What does this paper add?

The findings of this study suggest that effective guidelines include recommendations that are evidence-based, compatible with existing norms and values, easy to follow, and not requiring new knowledge or skills. To ensure guideline use in daily practice, guideline developers should consider the applicability of the recommendations as well as the evidence.

Potential facilitators
- The recommendation is largely supported with scientific evidence (e.g. clinical trials, cohort or case-control studies).
- The recommendation is supported with a discussion of the benefits (e.g. health gain).
- The recommendation is supported with a discussion of the harms and risks (e.g. drug side effects).
- The recommendation is easy to follow.
- The effects of the recommendation can be seen quickly.
- The recommendation is compatible with existing norms and values in practice.

Potential barriers
- The recommendation is part of a complex decision tree.
- The application of the recommendation requires new knowledge.
- The application of the recommendation requires new skills.
- The application of the recommendation demands changes in the organisation.
- The application of the recommendation requires changes in existing routines and habits.
- The recommendation can evoke negative reactions in patients.

Box 1. Attributes of recommendations.

guidelines,[11,12] the study commenced with a set of 16 attributes of recommendations. In a pilot study, using 28 recommendations, it appeared that two attributes (i.e. being 'concerned with a relevant aspect of daily care' and being 'concretely and specifically formulated') were present in more than 25 of the recommendations, and two attributes (i.e. 'supported with a discussion of costs' and 'demands extra resources') were present in fewer than two recommendations. These four attributes did not sufficiently discriminate and were therefore excluded. Thus, the final instrument consisted of 12 attributes (Box 1). Half of these are expected to facilitate adherence, the other half can be seen as potential barriers to the use of the guidelines by physicians.

Selection of recommendations

Performance data derived from an audit study of 200 general practitioners (GPs) in The Netherlands conducted in 1997 were used.[13] The GPs were randomly selected from proportional samples in different regions of the country. Data were collected from 7614 consultations using validated self-recording forms that were filled in immediately or shortly after the consultation. With these data, compliance was determined with key recommendations in 29 guidelines selected from a total of 51 available guidelines developed by the Dutch College of General Practitioners. The selected guidelines were equally distributed over different disease areas and covered acute as well as chronic diseases. They were rigorously developed according to principles of evidence-based medicine and were published in *Huisarts en Wetenschap*, the Dutch scientific journal for general practitioners, which reaches about 85% of practitioners.[14] The guidelines are widely accepted and play a prominent role in programmes of continuing medical education in The Netherlands.[15-17] The mean compliance rate in the audit study was 71%.

For the present study, recommendations with compliance rates of between 60% and 70% were excluded, because these can be considered as neither 'effective' nor 'non-effective' and thus not of interest to this study. The recommendations were proportionally distributed over the categories of diagnosis, education, treatment, follow-up, and referral, with a maximum of six per guideline. Thus, 63 recommendations

with high compliance rates (70% to 100%) and 33 recommendations with low compliance rates (0% to 60%) were selected (Table 1).

Formal assessment of recommendations

A panel of 12 experienced general practitioners were appointed, who were familiar with guideline methodology but not directly involved in the formulation of the recommendations included in this study. The recommendations were divided into six clusters and were independently assessed by two panel members. Each pair assessed one cluster. The panel members were asked to determine whether the 12 attributes (Box 1) were present or not present in the recommendations. They were blind to the actual compliance rates of the recommendations. We provided the panel members with a user guide to help them with the assessment. The results of the assessment were returned to each pair. Disagreement was resolved by discussion. Consensus was achieved in 99% of the assessments.

Analysis

The attributes of recommendations with high compliance rates (71% to 100%) were compared with those of recommendations with low compliance rates (0% to 60%). Cross-table statistics were used to calculate odds ratios (ORs) that could be considered as a measure of association between individual attributes and compliance rate. The attributes were ranked using the reciprocal values of odds ratios between 0 and 1. Differences in odds ratios between diagnostic and therapeutic recommendations were analysed. The remaining categories (i.e. education, follow-up, and referral) included too few recommendations (19 and nine respectively) to calculate odds ratios. All analyses were performed using SPSS 9.0 software.

Results

Four attributes were positively associated with high compliance rate; eight attributes had a negative effect on the compliance rate (Table 2). The effects of 'supported discussion of harms' and 'effects can be seen quickly' on compliance were negative in contrast with what was expected. All six potential barriers (attributes 7 to 12) had a negative effect on the compliance rate. The strength of the association varied among different attributes and was the highest for 'requires new skills' (OR = 0.25, 1/OR = 4.00), followed by 'part of complex decision tree' (OR = 0.40, 1/OR = 2.50) and 'compatible with norms and values' (OR = 2.20).

The influence of the different attributes on the compliance rate was not similar for diagnostic and therapeutic recommendations (Table 2). The support of the recommendation with a discussion of benefits and harms (attributes 3 and 4) was only positively associated with high compliance rates for therapeutic recommendations. For diagnostic recommendations the influence of 'part of complex decision tree' and 'easy to follow' was more relevant than for therapeutic recommendations. 'Evokes negative reactions in patients' was negatively associated with high compliance rates for diagnostic recommendations but positively associated with high compliance rates for therapeutic recommendations in contrast with what was expected.

Discussion

Our study shows that the applicability of recommendations is at least as relevant as their support with evidence to guarantee adherence to guidelines. The most important barriers to the application of recommendations are concerned with the need for new skills and the complexity of the recommendations. When the recommendations are easy to follow and compatible with norms and values, the application of the recommendations will be facilitated. For diagnostic recommendations, the ease of applying them in practice seems to be more important than for therapeutic recommendations. Complex diagnoses (e.g. syndromes with more than four criteria) or inconvenient procedures (e.g. gastroscopy) may deter physicians from following guidelines, even if there is sufficient evidence for them. In contrast, for ensuring use of therapeutic recommendations, the strength of the evidence seems relatively more important than factors such as complexity and patient expectations.

The findings of our study may help to understand why guidelines may not be used and why certain recommendations are more likely to be followed than others. This may be useful for guideline development organisations, as well as primary care groups responsible for implementing clinical governance in primary care.[18]

Some limitations of this study should be mentioned. Despite the large number of recommendations, the confidence intervals for the odds ratios were quite wide. Only for one attribute ('requires new skills') did the confidence intervals not include one. Nevertheless, the influence of 10 (out of 12) attributes confirmed our hypotheses, which is probably not owing to random effects. Conducting a study on a larger scale would be difficult, because each recommendation requires as many decisions as the number of attributes. This will progressively increase the task of the panel assessing the recommendations.

We could not test the influence of attributes in relation to the clarity of recommendations, because almost all selected recommendations were concrete and specific. This is not surprising because monitoring and audit studies use review criteria that are primarily based on concrete and specific

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Table 1. Percentage compliance rates of selected recommendations.

Percentage compliance rate	0–10	11–20	21–30	31–40	41–50	51–60	61–70	71–80	81–90	91–100	Total
Number of recommendations (%)	2 (2.1)	4 (4.2)	11 (11.5)	9 (9.4)	5 (5.2)	2 (2.1)	0	10 (10.4)	24 (25.0)	29 (30.2)	96 (100)

Table 2. Attributes of recommendations with high or low compliance rates. Figures are % of recommendations (number of recommendations).

	Attribute present in recommendations with high compliance rates (71%–100%) (n = 63)	Attribute present in recommendations with low compliance rates (0%–60%) (n = 33)	Odds ratio 95% CI	Ranking[a]
Facilitators				
Supported with scientific evidence	46.8 (29)	31.3 (10)	1.93 (0.87–4.75)	4
Supported with discussion of benefits	40.3 (25)	36.4 (12)	1.18 (0.49–2.83)	12
Supported with discussion of harms	9.5 (6)	15.2 (5)	0.59[b] (0.17–2.10)	6
Easy to follow	88.9 (56)	81.3 (26)	1.85 (0.56–6.04)	5
Effects can be seen quickly	59.7 (37)	71.0 (22)	0.60[b] (0.24–1.53)	7
Compatible with norms and values	87.3 (55)	75.8 (25)	2.20 (0.74–6.53)	3
Barriers				
Part of complex decision tree	11.7 (7)	25.0 (8)	0.40 (0.13–1.22)	2
Requires new knowledge	19.0 (12)	28.1 (9)	0.60 (0.22–1.63)	8
Requires new skills	6.6 (4)	21.9 (7)	0.25 (0.07–0.93)	1
Demands changes in organisation	8.1 (5)	12.1 (4)	0.64 (0.16–2.55)	10
Demands changes in routines	36.5 (23)	48.5 (16)	0.61 (0.26–1.43)	9
Evokes negative reactions in patients	38.1 (24)	42.4 (14)	0.83 (0.35–1.97)	11

[a]Ranking of attributes was determined by using the reciprocal values of odds ratios between 0 and 1. [b]Reverse of what was expected.

Table 3. Attributes of diagnostic and therapeutic recommendations.

	Diagnostic recommendations (*n* = 37)		Therapeutic recommendations (*n* = 31)	
	Odds ratio (95% CI)	Ranking[a]	Odds ratio (95% CI)	Ranking[a]
Facilitators				
Supported with scientific evidence	2.81 (0.50–15.7)	4	3.71 (0.70–19.6)	2
Supported with discussion of benefits	0.54[b] (0.13–2.30)	7	3.20 (0.72–14.1)	4
Supported with discussion of harms	NA[c]		1.13 (0.21–6.17)	11
Easy to follow	3.83 (0.55–26.9)	3	0.62[b] (0.05–7.75)	7
Effects can be seen quickly	0.60[b] (0.10–3.55)	9	0.30[b] (0.06–1.49)	3
Compatible with norms and values	NA[c]		1.07 (0.41–2.79)	12
Barriers				
Part of complex decision tree	0.19 (0.04–0.85)	1	0.80 (0.04–14.2)	9
Requires new knowledge	0.55 (0.12–2.56)	8	0.54 (0.10–2.94)	6
Requires new skills	0.19 (0.01–2.33)	2	0.24 (0.02–2.68)	1
Demands changes in organisation	0.43 (0.05–3.54)	6	0.87 (0.05–15.3)	10
Demands changes in routines	0.67 (0.16–2.73)	10	0.73 (0.17–3.11)	8
Evokes negative reactions in patients	0.40 (0.10–1.64)	5	2.22[b] (0.50–9.96)	5

[a]Ranking of attributes was determined by using the reciprocal values of odds ratios between 0 and 1. [b]Reverse of what was expected. [c]NA = not assessable owing to low numbers.

recommendations.[19] We are still convinced that recommendations should be concrete and specific in order to change behaviour or practice. In a randomised controlled trial, Shekelle *et al* confirmed that the clarity of a guideline significantly contributed to its effect.[20]

Although the guidelines were discussed in the context of continuing medical education, one might argue whether the general practitioners were aware of all recommendations included in our study. However, their decisions could still comply with the recommendations if these reflect current practice.

Our study builds on the previous work of Grol *et al* and its findings are largely consistent with their study.[8] However, both studies are limited by a cross-sectional design and could therefore not determine the ability of guidelines to change practice. In contrast, Foy *et al* examined attributes of recommendations in a retrospective study, using compliance rates before and after audit and feedback.[21] The results confirmed that recommendations compatible with existing norms and values, and not requiring changes to fixed routines, were associated with greater compliance. However, significant changes in compliance were only measured for recommendations seen as incompatible. In other words, the more compatible the recommendation the smaller the behavioural change.

Guidelines are developed to close the gap between research and practice, but the appearance of guidelines creates a new gap between their development and their use in practice. Whereas guidelines essentially aim to influence or change practice, they would be of little value if they were not used. Therefore guideline developers should consider the evidence as well as the applicability when formulating recommendations. For each recommendation they should ask themselves whether the recommendation is compatible with existing norms and values in practice and easy to follow, or whether it is complex and requires new knowledge and skills. Pilot testing of the guidelines among target users may provide additional information on barriers to implementation. If the application of the recommendation is expected to

be difficult but the supportive evidence is strong, appropriate implementation strategies should be designed to ensure change in daily practice. For instance, tools for application, such as algorithms or balance sheets, might facilitate the adherence to complex recommendations. If the recommendations require new skills, then workshops should be organised shortly after dissemination of the guideline. If a negative reaction from patients is expected, then specific mass media information for the general public may be helpful. Thus, anticipating the specific barriers to implementation will increase the effectiveness of the guidelines.

Future research should provide more information on the ability of guidelines to change practice. A prospective study with baseline and follow-up compliance data may be set up to study this aspect in more detail. The next step might be to measure the effect of clinical guidelines on changing patient outcomes.[22] Finally, qualitative studies concerning the reasons why physicians follow or do not follow guidelines could complement the knowledge about effective guidelines.

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