Chapter 22

Assessment of primary care by clinical quality indicators

Jozé Braspenning, François Schellevis and Richard Grol

What is this chapter about?

This chapter describes to what extent the care delivered in general practices is in agreement with clinical guidelines. Recommendations for good practice have been summarised in 139 indicators from 70 national guidelines. In this study, data on contacts, prescriptions, and referrals for a wide range of medical conditions were available for 106 quality indicators. Indicators on prevalence showed that detection rates could be improved for hypertension, hypercholesterolaemia, heart failure, alcohol abuse, dementia, anxiety, asthma in children, urine incontinence, hearing problems, and osteoporosis. Diagnostic imaging was requested according to the guidelines (76%), but this was less the case for laboratory tests (53%). Prescription-related indicators showed that the guidelines were more often followed when they related to not prescribing certain drugs (78%), rather than when they advised specific drugs (62%). Adherence was particularly high for referrals (89%). The indicators for preventative activities showed a high level of adherence (75%) but here too some improvement is possible. The indicators provide reference figures for current performance in general practice in the Netherlands. The adherence rates tell us about the quality of care delivered; the variance between practices provides further information on possible quality improvement.

Introduction

Since 1989, the Dutch College of General Practitioners has developed clinical guidelines for general practitioners (GPs). About 80% of the general practitioners appreciate these guidelines.[1] However, we know less about the adherence to these guidelines in general practices. A Dutch review study showed that in five years (1997–2003), only 22 studies evaluated the performance in general practices, of which 13 determined the adherence to a specific clinical guideline.[2] This type of information is much needed. Transparency of performance is for professionals an instrument to improve the quality of care provided.

Previous Dutch studies on adherence to guidelines focus on specific conditions such as asthma and chronic obstructive pulmonary disease (COPD), (threatening) miscarriage, low back pain or hypertension.[3–6] Two studies are available measuring the performance in general practice based on several differ-

ent guidelines.[7,8] These two studies made use of registration forms that had to be filled in by the GP after the consultation. This type of data collection is very time consuming, especially when the number of guidelines is increasing. Data from routine collection in general practices, e.g. electronic medical records (EMR), seems a welcome solution.

To measure the performance we have developed in an earlier study 139 quality indicators based on the Dutch clinical guidelines.[9,10]

A quality indicator is a measurable element of practice performance for which there is evidence or consensus that it can be used to assess the quality, and hence change the quality, of care provided.[11]

Following Donabedian's description of different aspects of quality of care, three types of quality indicators can be distinguished: structure, process and outcome indicators.[12] Applied to diabetic care, having specific clinic hours for diabetics is a structure indicator, performing feet examination is a process indicator and the haemoglobin A_{1c} (HbA_{1c}) value is an outcome indicator (a proxy for possible complications in the future). These indicators have been used in the second Dutch National Survey of General Practice (DNSGP-2) to describe the quality of primary care.[13,14]

In this chapter, we focus on the extent of agreement between the care delivered in Dutch general practices and clinical guidelines.

How was it done?

For a description of the methods of the (first and) second Dutch National Surveys of General Practice (DNSGP-1, 1987 and DNSGP-2, 2001), *see* Chapter 2. The following is specific for the study described in this chapter.

Quality indicators

The Dutch College of General Practitioners developed 70 partly evidence-based and partly consensus-based guidelines.[9,10] These guidelines represent for the most part medical decisions in general practice and they are regularly being revised according to new or better evidence. The subjects addressed vary from acute otitis media to low back pain, from diabetes mellitus to asthma and from screening on cervical cancer to osteoporosis. Indicators were extracted from these guidelines using an iterative rating consensus procedure.[14] In five consensus rounds, indicators were identified that expressed quality of care in terms of expected health benefits and reducing harm or costs. The indicators were formulated using diagnostic and medication codes, e.g. International Classification of Primary Care (ICPC) and Anatomical Therapeutic Chemical Drug Classification (ATC).[15,16] Furthermore, the data from a national health information network for general practices (LINH, *see also* Chapter 30) were explored in order to get information on the number of indicators that could become available from routinely collected data. This procedure resulted in 139 indicators from 61 guidelines. For these indicators, specific information was available in the electronic medical records and this could be extracted in a

uniform and structured manner. For 13 of these indicators we used additional electronic questionnaires (*see* Table 22.1 for an overview).

Most of the indicators are process indicators (n = 124) that have been categorised in indicators on diagnostics (n = 13 on the prevalence and n = 21 about testing); on medication (n = 52); on referrals to primary and secondary care (n = 28); on prevention (n = 9); and on health education (n = 1). Furthermore, 10 structure indicators and 5 outcome indicators were involved in the study.

Table 22.1 The 61 Dutch guidelines from which 139 quality indicators were derived

Guideline	Number of indicators	Guideline	Number of indicators
Hypertension	8	Eye diagnostics	1
Hypercholesterolaemia	4	Red eye	1
Peripheral artery disease	1	Acute otitis media	2
Angina pectoris	1	Otitis media with effusion in children	1
Transient ischaemic attack (TIA)	2	Otitis externa	2
Heart failure	4	Hearing complaints	3
Diabetes mellitus, type 2	10	Atopic dermatitis, eczema	2
Asthma in children	3	Acne	3
Asthma and COPD in adults: diagnostics	1	Venous ulcer of the leg	2
Asthma among adults: treatment	2	Psoriasis	2
COPD: treatment	3	Dermatophytosis	1
Depression	4	Bacterial skin diseases	3
Anxiety	2	Pressure sores	1
Dementia	1	Vaginal discharge	1
Disturbance of sleep	1	(Threatening) miscarriage	1
Problematic alcohol use	1	Subfertility	1
Stomach ache, pain	5	Vaginal bleeding	1
Acute diarrhoea	2	Pregnancy and puerperium	1
Ankle sprains	3	Intra-uterine device	1
Shoulder complaints	2	Amenorrhea	1
Low back pain	2	Pelvic inflammatory disease	1
Lumbar radiation	2	Genital herpes	1
Tennis elbow	2	Urethritis in men	2
Non-traumatic knee disorders in children and adolescents	1	Lower urinary tract symptoms	3
Sprains and strains of knee	1	Nephrolithiasis	2
Non-traumatic knee disorders	1	Urinary tract infection	2
Osteoporosis	5	Urine incontinence	2
Migraine	2	Enuresis	2
Influenza and influenza vaccination	6	Acute sore throat	3
Screening for cervical cancer	2	Sinusitis	4
		Fever in children	2

Data collection

For some indicators extra information was necessary. For instance, to calculate an indicator score on referral in cases of low back pain it was necessary to know whether the low back pain complaints were acute or not. For this information, an electronic questionnaire was developed that was triggered by the diagnostic ICPC code and was to be answered by the GP. This additional questionnaire was activated in the software system in the practices for three months.

Participating practices

In 101 out of 104 practices, data for the prevalence indicators could be collected; for referral and prescription indicators these numbers were respectively 99 and 97 practices. For some indicators, lower numbers of practices participated, as can be seen in the tables. Availability of extraction software in specific practices and additional questioning were the main reasons for getting less response.

Analyses

Except for the prevalence indicators, the indicators were formulated in such a way that a higher percentage represents closer adherence to the guidelines. Prevalence indicators were expressed in a number per 1000 patients. The percentage is an overall mean for all practices and is accompanied by a standard deviation to show the variation among practices. The unit of analysis is not the same for all indicators. Units of analysis could be the GP, the patient or the disease episode. For most structure indicators, the unit of analysis was the GP. For the prevalence figures and the prevention indicators, the unit of analysis was the patient, and for all other indicators it was the disease episode.

What was found?

Adherence to guidelines

Diagnostics

There is variation in the rate of (early) detection of chronic conditions. The indicators studied included the prevalence of diabetes mellitus, hypertension, hypercholesterolaemia, heart failure, problematic alcohol use, dementia, depression, anxiety disorders, urine incontinence, hearing impairment, asthma in children and osteoporosis (*see* Table 22.2). There was considerable divergence for the prevalence of hypertension (mean annual prevalence of 57.1 per 1000 patients), but also for instance for osteoporosis (mean annual prevalence of 4.2 per 1000 patients).

Requests for imaging diagnostics are largely conducted according to guidelines (76%). Guidelines about laboratory testing are adhered to in 53% of cases. Guidelines indicating when a certain test should be carried out are better adhered to than guidelines indicating there is no need for testing. Altogether, the rate of adherence to guidelines for diagnostics is 65% (*see* Table 22.3). Some examples are given in Table 22.4.

Table 22.2 Quality indicators on prevalence in Dutch general practice

Condition	Prevalence rates per 1000 patients in general practice				
	Age (years)	Total	95% CI	Men	Women
Diabetes mellitus	All	26.3	24.4–28.2	24.5	28.0
Hypertension	All	57.1	52.0–62.2	43.6	70.4
Hypercholesterolaemia	All	17.8	15.0–20.6	19.5	16.0
Heart failure	All	7.4	6.7–8.1		
	45–64			3.9	2.0
	65–74			25.9	17.8
	≥75			95.2	87.4
Asthma in children	<1			139.7	81.7
	1–4			66.4	43.5
	5–14			44.3	33.1
Depression	All	21.2	19.1–23.3	13.7	28.6
Anxiety disorders	All	7.1	6.0–8.2	4.5	9.6
Senile dementia	65–74	1.7	1.5–1.9	3.3	2.8
	≥75			22.0	28.3
Problematic alcohol use	All	1.7	1.4–2.0	2.6	0.9
Urine incontinence	All	6.0	4.8–7.2	2.1	9.9
Hearing impairment (presbyacusis)	All	2.3	2.0–2.6	2.6	2.1
Osteoporosis	45–64	4.2	3.4–5.0	1.1	8.5
	65–74			3.9	28.1
	≥75			8.6	42.3

Source: Van der Linden *et al.* (2004)[17]

Table 22.3 Adherence to Dutch guidelines: practice means in % and range between indicators

	% Adherence	Range between indicators (%)
Diagnostics, 11 indicators	65	13–96
imaging techniques	76	13–96
laboratory testing	53	32–78
Medication, 44 indicators	68	10–99
don'ts	78	33–99
dos	62	10–99
Referral primary and secondary care, 25 indicators	89	41–100
Total	74	10–100

Medication

Guidelines are reasonably well adhered to when they indicate that a certain drug is not needed or should not be administered ('don'ts': 78%). Guidelines suggesting the prescription of a specific drug are less well followed ('dos': 62%). Altogether, the rate of adherence to prescription guidelines is 68% (*see* Table 22.3). An example is shown in Box 22.1.

Table 22.4 Example of quality indicators

	% Adherence	Standard deviation
Diagnostics		
Percentage of episodes of low back pain in which no X-ray was requested (n = 2244 episodes in 57 practices)	90	9.1
Percentage of episodes of acute diarrhoea in which the faeces were not tested (n = 641 episodes in 67 practices)	34	28.1
Medication		
Percentage of episodes of lower urinary tract symptoms in which no finasteride has been prescribed (n = 2023 episodes in 97 practices)	94	9.3
Percentage of episodes of urinary tract infection in which nitrofurantoin or trimethoprim has been prescribed (n = 14 155 episodes in 97 practices)	68	15.7
Referrals		
Percentage of episodes of ankle sprain that was not referred to a physiotherapist (n = 3032 episodes in 99 practices)	89	13.1
Percentage of episodes of non-traumatic knee disorders in patients aged up to 22 years that was not referred to an orthopaedic specialist (n = 6512 episodes in 99 practices)	100	1.4

Box 22.1 An example on antibiotic policy

In the Netherlands, some 80% of all antibiotics are prescribed in general practice. The guidelines recommend restrictive prescribing of antibiotics, on account of preventing antibiotic resistance; and when antibiotics are needed, a first-choice drug is proposed. Nine guidelines concern prescribing of antibiotics, on which 13 indicators are based. There is a 62% adherence rate for prescribing antibiotics. A recommendation not to prescribe an antibiotic is better adhered to than recommendations for a first-choice antibiotic. The rate of compliance with guidelines varies considerably per indicator and also varies between the different indicators. The variation is greater when the guideline recommends a specific antibiotic than when an antibiotic is not recommended. Two-thirds of the patients with sinusitis get antibiotics (67% of episodes); there is a very high rate of compliance with the guideline on prescribing antibiotics for

asthma in children. Antibiotics are prescribed in only 6% of cases. A high rate of compliance with the recommendations on antibiotic prescriptions does not mean that the recommendations on first-choice antibiotics are adhered to as well. In the same general practices under-prescribing as well as over-prescribing can occur. In Table 22.4 we show some examples.

Referrals

Of all referral indicators, 89% are according to the guidelines (*see* Tables 22.3 and 22.4). For referrals to physiotherapy, this is 83% when we exclude the very low number of referrals to the physiotherapist in case of urine incontinence in women (19.4%). The other referrals to secondary care have a mean number of guideline adherences of 93%. Differences between general practices are small, and even smaller as the rate of adherence approaches 100%.

Prevention

Of all patients in high-risk groups, 75% are vaccinated against influenza. The vaccination rate is particularly high among patients with cardiovascular diseases and diabetics. The vaccination rate among lung patients and of elderly patients (over 65 years) without a medical indication could be higher.

The average net uptake rate for population screening for cervical cancer is 74%. The uptake rate is considerably higher, i.e. 10–15%, when the practice is actively involved in inviting the eligible women.

Number of quality indicators

We have started off with 139 indicators but we could collect data for only 106 indicators. Although we already knew our dataset, we were too optimistic about collecting reliable data for clinical parameters, such as blood pressure and blood glucose. We were not able to decide if the measurements had taken place (process indicators), and we stayed unaware of the actual outcomes (outcome indicators).

What to think about it

Measuring the quality of care is not an easy task. It has become clear that it is possible to measure the quality of care on the basis of these indicators. The information about medical performance has mainly been derived from the electronic patient record systems, supplemented with a brief electronic questionnaire. A new challenge emerges once the data have been collected. How can the results be presented in a way that does justice to the data and delivers a clear message? According to O'Leary (1995), chairman of the Joint Commission on Accreditation of Healthcare Organizations:[18]

> *... the problem with measurement is that it can be a loaded gun – dangerous if misused and at least threatening if pointed in the wrong position.*

We can calculate a total score, which indicates to what extent the actual performance in general practice agrees with the guidelines. For general practice performance, this score is 74%. Literature review shows that this figure was 55% in the period prior to 2001.[2] Although the tasks performed are not entirely comparable, these statistics clearly indicate an increase. The figure of 74% may also be regarded as high in international context.[19–21] However, there was considerable divergence in scores between the different indicators and between practices. Categorising the indicators according to different aspects of performance draws a clearer picture. Describing all the separate indicators is not an easy task. Clearly, it would help to divide them into categories, but further study is needed on the possibility of categorising groups of indicators. Which indicators can be summed up in categories on the basis of strong links, and which cannot? If some groups can be put together because they more or less cover the same area, would we need fewer indicators in future? This would make the task of determining the quality of performance easier.

We can establish where there is room for improvement by examining the scores for the different indicators. With regard to referrals, the figures show that there is a high adherence rate to the guidelines. However, a relatively large number of unnecessary referrals to physiotherapy have been made (one in five). With regard to prescribing drugs, there was a clear distinction between the 'dos' and 'don'ts'. Evidently, Dutch GPs are more likely to refrain from prescribing, than to prescribe first-choice medication.

The indicators had a maximum score of 100% and a minimum score of 0%. An adherence rate of 100% was not expected, because situations will always arise where a doctor's judgement regarding a specific patient will indicate a deviation from the guideline. For some indicators, an adherence rate of 100% is almost attainable, whereas for other indicators the expected rate is much lower. This difference is partly linked to the guidelines themselves, since some guidelines contain more strict recommendations than others.

For a number of indicators there were problems in gathering valid and reliable information on the basis of the routine data registered in the electronic patient record system. The problems concerned data on giving information and advice, and data about certain measurements taken and the results, such as blood pressure, cholesterol level and glucose levels. The current electronic patient record systems do not facilitate registration of these data in a uniform and accessible way. We recommend that electronic patient record systems should be equipped with suitable software capable of supporting disease management in the area of diabetes mellitus, asthma and COPD, as well as risk factors for cardiovascular disease.

The quality of GP care in the Netherlands measured by adherence to guidelines is rather good.

It can be concluded that the quality of GP care in the Netherlands measured by adherence to guidelines is rather good; however, specific fields for quality improvement for certain practices also became clear. To get a broader view on the quality in practice, other aspects should be measured as well, such as practice management and patients' experience.[22,23] For the latter, *see also* Chapters 23 and 24.

References

1 Geijer RMM and Meulenberg F (1999) Dertig standaarden geactualiseerd: waakzaam afwachten en/of gestructureerde zorg? [Thirty standards made up to date: waiting and being on guard and/or structured care?] In: Geijer RMM, Burgers JS, Van der Laan JR *et al.* (eds) *NHG-Standaarden voor de Huisarts I.* [NHG-standards for GPs I.] Elsevier/Bunge, Maarssen, pp. 1–10.

2 Braspenning J, Schiere AM, van Roosmalen M, Mokkink H and Grol R (2004) Kwaliteit van Huisartsgeneeskundig Handelen Moeilijk te Meten. Een literatuuroverzicht over 1997–2003. [Quality of interventions in general practice hard to measure. A literature survey of 1997–2003.] *Huisarts en Wetenschap.* **47**: 184–7.

3 Smeele IJ, Grol RP, van Schayck CP *et al.* (1999) Can small group education and peer review improve care for patients with asthma/chronic obstructive pulmonary disease? *Qual Health Care.* **8**: 92–8.

4 Fleuren M, Van der Meulen M and Wijkel D (2000) Do patients matter? Contribution and care provider characteristics to the adherence of general practitioners and midwives to the Dutch national guidelines on imminent miscarriage. *Qual Health Care.* **9**: 106–10.

5 Schers H, Braspenning J, Drijver R, Wensing M and Grol R (2000) Low back pain in general practice: reported management and reasons for not adhering to the guidelines in the Netherlands. *Br J Gen Pract.* **50**: 640–4.

6 Frijling BD, Spies TH, Lobo CM *et al.* (2000) Blood pressure control in treated hypertensive patients: clinical performance of general practitioners. *Br J Gen Pract.* **51**: 9–14.

7 Grol R, Dalhuijsen J, Thomas S *et al.* (1998) Attributes of clinical guidelines that influence use of guidelines in general practice: observational study. *BMJ.* **317**: 858–61.

8 Spies TH and Mokkink HGA (1999) Toetsen aan standaarden. [*Using Guidelines in Clinical Practice.*] Centre for Quality of Care Research/Dutch College of General Practitioners, Nijmegen/Utrecht.

9 Geijer RMM, Burgers JS, van der Laan JR *et al.* (eds) (1999) *NHG-Standaarden voor de Huisarts I.* [NHG-standards for GPs I.] Bunge, Utrecht.

10 Thomas S, Geijer RMM, van der Laan JR and Wiersma TJ (1996) *NHG-Standaarden voor de Huisarts II.* [NHG-standards for GPs II.]. Bunge, Utrecht.

11 Lawrence M and Olesen F(1997) Indicators of quality in health care. *Eur J Gen Pract.* **3**: 103–8.

12 Donabedian A (1980) *Explorations in Quality Assessment and Monitoring (vol 1): the definition of quality approaches to its assessment.* Health Administration Press, Michigan, Ann Arbor.

13 Braspenning JCC, Drijver R and Schiere AM (2003) *Kwaliteits- en Doelmatigheidsindicatoren voor het Handelen in de Huisartspraktijk. Handboek Kwaliteit van Zorg.* [Quality and efficiency indicators for GPs' interventions. Manual of Quality of Care.] Maarssen: Elsevier, Maarssen, C4.4: 1–30.

14 Campbell SM, Braspenning J, Hutchinson A and Marshall M (2002) Research methods used in developing and applying quality indicators in primary care. *Qual Saf Health Care.* **11**: 358–64.

15 Lamberts H and Wood M (1987) *ICPC: International Classification of Primary Care.* Oxford University Press, Oxford.

16 *Diagnostisch Kompas 1999/2000.* [Diagnostic Compass 1999/2000.] College voor zorgverzekeringen, Amstelveen.

17 van der Linden M, Westert GP, de Bakker DH and Schellevis FG (2004) *Tweede Nationale Studie naar Ziekten en Verrichtingen in de Huisartspraktijk. Klachten en aandoeningen in de bevolking en in de huisartspraktijk.* [Second Dutch National Survey of General Practice. Complaints and illnesses in general practice.] NIVEL/RIVM, Utrecht/Bilthoven. *See also* www.NIVEL.nl/nationalestudie

18 O'Leary DS, Nadzam DM, Loeb JM and Jessee WF (1995) Framework for performance measurement of health care networks and health plans. *Manag Care Q.* **3**: 48–53.
19 Schuster M, McGlynn E and Brook R (1998) How good is the quality of health care in the United States? *Milbank Q.* **76**: 517–63.
20 Seddon ME, Marshall MN, Campbell SM and Roland MO (2001) Systematic review of studies of quality of clinical care in general practice in the UK, Australia and New Zealand. *Qual Health Care.* **10**: 152–8.
21 McGlynn EA, Ash SM, Adams J *et al.* (2003) The quality of health care delivered to adults in the United States. *N Engl J Med.* **348**: 2635–45.
22 Van den Hombergh P (1998) *Practice Visits. Assessing and improving management in general practice.* [dissertation] KUN, Nijmegen.
23 Grol R, Wensing M, Mainz J *et al.* (2000) Patients in Europe evaluate general practice care: an international comparison. *Br J Gen Pract.* **50**: 882–7.