



# **Electronic feedback system for GPs: An opportunity for quality improvement?**

**Evelien Bossink**

**Anneliek Corten**

Studentnr: 0132683

Studentnr: 0134333

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Begeleiders:

Dr. P. Giesen, huisarts-onderzoeker

Dr. H Morkink, universitair docent

Drs. M. Padros-Goossens, onderzoeker

Kenniscentrum huisartsenposten

en spoedzorg

## Voorwoord

In het kader van de studie geneeskunde hebben wij een wetenschappelijke stage gedaan op de afdeling kwaliteit van zorg (KWAZO).

Onze doelstelling was om meer inzicht te krijgen in wetenschappelijk onderzoek en in het ontwikkelen van een meetinstrument, het proces van starten met gegevens, het analyseren en vervolgens het schrijven van een onderzoeksverslag. Wij hebben de afgelopen maanden een erg leerzame en leuke tijd gehad.

Wij willen in het bijzonder Paul Giesen, Henk Morkink en Marc Padros-Goossens bedanken voor hun enthousiaste begeleiding.

Dit onderzoek hebben we met 2 studenten uitgevoerd en de scriptie hebben we gezamenlijk geschreven. We hebben een scoringslijst ontwikkeld die voor verder onderzoek naar feedback gebruikt kan worden. Om de reproduceerbaarheid van deze lijst te kunnen meten door middel van de inter-observer variabiliteit, was het noodzakelijk dit met 2 personen uit te voeren. Ook was de omvang van het onderzoek dermate groot, dat er 2 stagiaires nodig waren om het onderzoek binnen de gestelde tijdsperiode af te ronden. Wanneer we dit onderzoek zouden opsplitsen in twee verschillende delen en scripties, ging dit ten koste van de kwaliteit van het onderzoek. Daarom hebben we dit onderzoek gezamenlijk uitgevoerd en uitgewerkt.

Evelien Bossink

Anneliek Corten

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# 1. Abstract

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*Background:* In The Netherlands, out-of-hours primary health care is provided by GP cooperatives. For the learning objectives of the GPs on duty, receiving feedback from the patient's own GP is important. For this reason, an electronic feedback program has been developed and now used in several GP cooperatives. This is a new program and there is no measuring instrument for analyzing the feedback data.

*Objective:* To develop a reliable measuring instrument for categorizing the feedback information. To investigate which aspects of health care the feedback is about, are there learning objectives? Also to study the feedback about patients who died unexpectedly and their characteristics.

*Methods:* Cross sectional pilot study of patient files of one GP cooperative and the matching feedback given by the patient's own GP. A classification system was constructed to categorize all feedback information. Of the 46,542 patients who visited the GP cooperative, GPs gave feedback in 3,659 (7.9%) cases. Of these 3,659 cases, the 999 most recent were studied. Two observers categorized 500 cases each. An International Classification of Primary Care (ICPC) code was used to label the diagnosis. The feedback with learning objectives and information about patients who died unexpectedly was discussed by three observers and further categorized.

*Results:* We developed a classification system, which was tested for the inter-observer variability and gave an average Kappa value of 0.86. Of the 999 feedback cases 69.9% were about diagnosis, 27.7% about the patient's disease course and 19.0% about hospitalization. Of the feedback 1.0% was about organisation and 0.7% about communicational aspects. Of the patients with chest pain, suspected for heart disease, only one third actually had a myocardial infarction. Retrospectively some of these patients with a myocardial infarction had not been referred immediately by the GPC. Out of 999 feedback cases, there were 7 unexpected deaths, which were possibly avoidable by the GP of the cooperative (GPC). These cases were mostly elderly patients with acute cardiovascular diseases. Of the 999 cases, 5.3% contained an explicit opinion with an obvious learning objective. Cases with a learning objective concern mainly accessibility to the patient's records, inadequate triage due to improper questioning of the patient, lacking of a physical examination and doctor's delay.

*Conclusion:* A reliable measuring instrument was developed for categorizing this feedback data and the developing process guaranteed a high face and content validity. Compared to the large amount of feedback about diagnosis, there was a low percentage about communication and organisation. Possibly avoidable deaths and learning objectives concerned mostly elderly patients with acute cardiovascular diseases. The feedback program is a promising initiative, but still needs some adjustments.

## 2. Introduction

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In the Netherlands primary health care is organised by general practitioners (GPs). Until the 1960's, many Dutch GPs took care of their own patients during out-of-hours. Therefore they were on call most of the time. Later GPs formed small rota groups of five to ten doctors, in which they were on call for each other's patients. The reasons GPs wanted to reorganise were for instance the heavy workload, the lack of separation between work and private life and the poor salary.<sup>1-5</sup> Also there were more complaints by patients about out-of-hours care than the normal daily care, suggesting that small rota groups did not function properly.<sup>6</sup> Since the year 2000 the out-of-hours primary health care by GPs has been substantially reorganized into large-scale GP cooperatives, following British and Danish examples.<sup>7:8</sup> In these cooperatives 40-250 GPs take care of populations ranging from 100,000 to 500,000 inhabitants. In 2005 there were 131 GP cooperatives in or nearby a hospital.<sup>5</sup> These cooperatives include more than 90% of the Dutch population. The out-of-hours service is available from 5 pm to 8 am and during the entire weekend. The health service is intended for patients with urgent help requests who cannot wait until the next day. Due to the reorganisation of the small rota groups into large-scale cooperatives, some new problems emerged.

Currently there is a lot of discussion about health care safety by government and media. In 2004 there were 76,500 patients with iatrogenic harm and unintentionally 1,700 patients passed away. This is about patients admitted or treated in the hospital.<sup>9</sup> The GP cooperatives were criticized by The Health Care Inspectorate because the telephone triage by medical assistants was unsafe, care was not effective, not patient-orientated and was not addressing the actual needs of the patient.<sup>10</sup>

Another problem nowadays is that most doctors don't know other GPs of the cooperative personally and the threshold to give feedback might be higher, because the opportunity is simply lacking. We assume that it is very important for doctors to receive feedback about the consequences of their medical decisions, so that they can correct errors and learn from the opinions of their colleagues. Eventually this may lead to improvement of the quality of healthcare.

GPs could give each other feedback by scheduling meetings, or by phoning colleagues, but about the reasons why this is not done can only be speculated. Perhaps meetings are not time-effective and the threshold for phoning an unknown colleague is too high.

To enable doctors to give and receive feedback to and from their colleagues of the GP cooperative, an expert panel on quality of health care initiated the design for an electronic feedback program. This computer program was further developed by Modatran Internet Solutions and is used by three cooperatives in The Netherlands, since January 2005.<sup>11</sup>

Basically the electronic feedback program gives the patient's own GP the opportunity to write feedback to the doctor who saw the patient at the GP cooperative. In this study we will name the GP on duty at the cooperative 'GPC'. For details about how the feedback program works see the appendix figure 1.

The system of electronic feedback from the GP to the GP cooperative is unique. To obtain insight into GPs opinions of the electronic feedback system, a questionnaire was held in 2006 among doctors of the same cooperative who had used the program for a year. Almost all doctors (86%) agreed that feedback about an unexpected outcome of medical decisions contributes to quality improvement of healthcare. The conclusion from this questionnaire is that doctors find feedback useful and fun to give and receive.<sup>12</sup>

The electronic feedback system was designed with the intention of improving quality of health care. Up to now there is no information about which aspects of healthcare, feedback is given and how often this is done. No valid measuring instrument to analyze feedback information is available. The main objective of this study was to develop a proper measuring instrument and use this to classify the feedback.

Research questions:

1. What is the reliability and validity of the developed measuring instrument for categorizing the feedback information?
2. Which aspects of health care is the feedback about and what is the frequency of these aspects?
3. What are the characteristics of patients who died unexpectedly and was this possibly avoidable?
4. Are there obvious learning objectives for the GPC and if so, what are these about?

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## 3. Methods

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### 3.1 Design

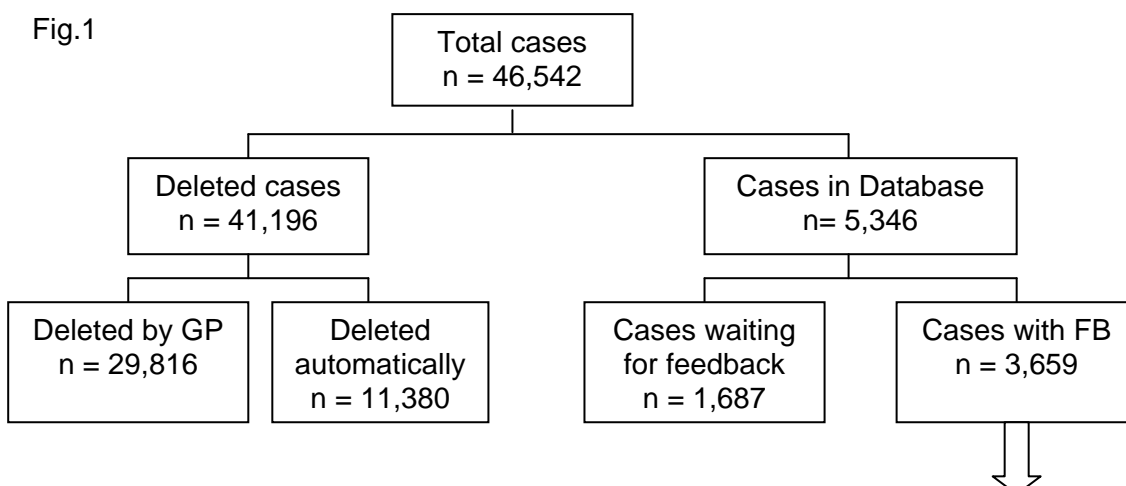
This is a cross-sectional pilot study about patient files of the GP cooperative and the matching feedback given by the patient's own GP. The quality of health care commission of the GP cooperative instructed GPs how to use the electronic feedback program. They were instructed to give brief feedback containing objective facts or interesting information.

### 3.2 Population

The patient cases with matching feedback were gathered from November 2005 up to July 2007 at a GP cooperative in the Netherlands. At the GP cooperative, all 98 GPs used the feedback program.

Since the program has been used, 46,542 patients consulted the cooperative. Of all cases placed into the feedback program, 41,196 cases were deleted. Of the deleted cases, 29,816 were deleted by GPs because in their opinion no feedback was needed and the program deleted 11,380 cases automatically because no feedback was given after 5 weeks. At the time of this research there were 5,346 cases in the database of which 3,659 cases with feedback and 1,687 still waiting for feedback (See fig.1). Of the 3,659 cases, the SOAP registration (subjective, objective, assessment and plan) and the matching feedback were available for this research. Of the 3,659 cases, 2,000 were not useful because information about the age of the patient and sex were missing, leaving 1,659 cases. Because of limited time for this pilot study 1,000 cases were selected for this research. These were categorized by two observers, 500 cases each. This is a large amount and expected to give reliable results. One case was missing because of a technical problem so eventually 999 cases were included.

Fig.1



### 3.3 Measuring instrument: classification system

Fig. 2

#### 3.3.1. Development

In order to analyze the feedback information and answer the research questions, a computerized classification system was developed (fig. 2). The first versions were designed by trial and error, 50 cases were read and the main topics in the feedback were written down. This number of cases gave a good idea of the different aspects of the feedback and what items could be used for the classification system.

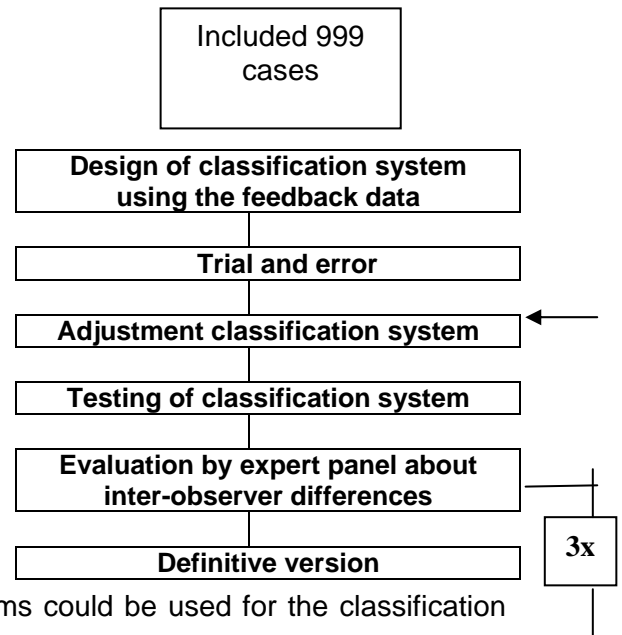
Because this is a pilot study and this research might be repeated on larger scale in future, categorizing data needs to be reproducible. In order to measure the reproducibility, two independent observers classified the data. The Kappa value was calculated, using SPSS. The Kappa value is used to show the rate of correspondence between the two observers in their observation of the feedback. A Kappa value of 0.00 means the observers do not correspond on any item, a Kappa of 1.00 means the observers correspond on all the items. Three times, two independent observers categorized 50 cases, the Kappa value was calculated, the inter-observer differences were evaluated and the items revised. Finally a definitive version was created, containing 13 different main categories and 28 subcategories in which almost all feedback could be categorized (Main categories are listed in § 3.3.2). A detailed manual was written about how to use the classification system (See appendix for the manual).

#### 3.3.2. Main categories of the measuring instrument

Each feedback message was categorized into one or more of the main categories. When a main category was chosen, the data was further classified into subcategories.

The 13 main items were:

- Diagnosis of the GPC: The diagnosis as stated in the SOAP information, made by the GPC and matched to an International Classification of Primary Care (ICPC) code.
- Diagnosis of the GP: The diagnosis given in the feedback by the patient's own GP, matched to an ICPC code.
- Course: If the patient's condition improved, worsened or if the patient passed away.



- Prescription: If the feedback was about the prescription written by the GPC or by the GP afterwards.
- Referral: Referral of the patient to the A&E (ambulance & emergency) department or to a specialist by the GPC or by the patient's own GP.
- Admission: The patient was admitted to the hospital, nursing home or other institute.
- Advice: The GPC made a decision about the therapy or gives advice to the patient's GP.
- Diagnostic tests: The GP requests tests that were evaluated by the GP himself.
- Treatment: Treatment by hospital or GP.
- Organisation: Organisation of the GP cooperative.
- Communication: Communication between patient and GPC or medical assistant.
- Explicit opinion: The feedback involves a learning objective, a compliment or confirmation, or some other subjective opinion.
- Not able to classify: If the feedback cannot be classified in one of the other main categories.

(For full explanation of these variables, see the manual in the appendix)

To be able to compare the diagnosis made by the GPC and the eventual diagnosis given in the feedback message, the ICPC was used to label the diagnosis.<sup>13</sup> This was done to discover differences in diagnoses between GPC and GP. If there was no differential diagnosis made by the GPC, the ICPC was labelled using the information about the main complaint of the patient as stated in the SOAP. If the first diagnosis was rejected, but no new diagnosis was given, this was labelled as "M99" (Missing). The letters of the two ICPC codes were compared. For example, if the first ICPC was "K01", meaning "chest pain due to heart problem" and the second ICPC is "K75", meaning "acute myocardial infarction", the GP's line of thought was correct. Another possibility is, when comparing the ICPCs, they have a different letter and thus there is a discrepancy between the first and second diagnosis. For example the first ICPC code is "P29" because the GPC's diagnosis was "symptoms/complaints due to a psychological problem" and the feedback of the GP is that the diagnosis was "K90" meaning a "cerebrovascular accident"

The cases, about which the observers were not sure how to categorize, were discussed.

(For more information see the ICPC-list in the appendix)

### **3.5 Analysis of feedback**

All the 999 feedback cases were analysed using SPSS. The frequencies of the main categories were calculated.

Some feedback cases were placed in the main category 'course' and subcategory 'unexpected deaths', meaning the patient suddenly died and the death cause was not related to earlier diagnosis, or that the wrong diagnosis was made earlier by the GPC. Unexpected is not when a patient passed away, who was already known to be terminally ill.

An example of an 'unexpected death': A patient complaining of back pain, was prescribed painkillers because the GPC diagnosed the patient with muscular pain. The GPC advised the patient to report to his own GP the next morning. The feedback of the patient's own GP was: 'patient died during the night, post-mortem autopsy showed a ruptured abdominal aneurysm'. To test the validity, the feedback with learning objectives and information about patients who died unexpectedly were discussed once more by two medical students and a GP. This was done because a GP is more and expert in this field and has more experience with medical decision-making.

There were some feedback cases about patients who died unexpectedly, but were registered in the feedback program twice. The feedback about one and the same patient was combined. According to consensus of two medical students and an experienced GP, the cases about 'unexpected death' were divided into deaths that were possibly avoidable and those that were unavoidable. These cases were described qualitatively. The cases with learning objectives were discussed, grouped together according to diagnosis and also described qualitatively.

## 4. Results

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### 4.1 Measuring instrument

The Kappa value of the main categories from 50 cases is shown in table 1: Values ranged from 0.56 to 1.00. The average Kappa value was 0.86.

Table 1. The Kappa of the main categories of the classification system

Main items	Kappa
ICPC GP cooperative	*
Diagnosis	0.83
Course	0.95
Prescription	0.79
Referral	1.00
Admission	0.93
Advice	**
Diagnostic tests	**
Treatment	0.90
Organisation	**
Communication	**
Other	0.90
Explicit opinion	0.56

\* Cannot be measured, \*\* Cannot be measured, n=1

### 4.2 Aspects of feedback and frequency

#### 4.2.1 General aspects and frequency

The feedback is about many different aspects, ranging from diagnosis to organisational aspects. In 69.9% of the cases there is feedback about the diagnosis, 27.7% is about the patient's disease course and 19.0% about hospital admission. Table 2 shows the different aspects and the frequency of feedback given. Of the feedback, 1.0% was about organisation and 0.7% about communicational aspects. (The frequency of different aspects together with the subcategories is shown in more detail in table 1 of the appendix).

Table 2: Type and frequency of the feedback.

Aspect	Percentage out of total number of cases n=999
Diagnosis	69,9
Course	27,7
Prescription	5,3
Referral	14,9
Admission	19,0
Advice	4,5
Diagnostic tests	5,3
Treatment	11,9
Organisation	1,0
Communication	0,7
Not able to classify	12,8
Explicit opinion	12,7

Because the feedback can be about more than one aspect, the percentages of the items added up is higher than 100%.

#### 4.2.2. Specific aspects of diagnosis and frequency.

In 69.3% of all cases an ICPC code was both attached to the diagnosis made by the GPC as to the diagnosis later given by the GP. Of all cases in which the ICPC could be compared, 62.4% were in different categories. The rest, 27.6%, were in the same category and in 10.0% the first diagnosis was rejected but no new one was given.

In the ICPC group of the circulatory tract (K), there were 56 cases diagnosed with “K01” (chest pain due to heart disease) by the GPC. According to the feedback, 17 patients were diagnosed in hospital with an acute myocardial infarction. In 15 patients the diagnosis chest pain was rejected and no new diagnosis was given. The other 24 patients out of 56 had chest pain, which was not due to a heart problem. Instead another diagnosis was given such as hyperventilation. Of the 17 patients with chest pain who were later diagnosed with an acute myocardial infarction, 13 were referred to the A&E department, but 4 were not immediately referred by the GPC.

In the ICPC group of the musculoskeletal tract (L), there were 171 patients with musculoskeletal complaints. According to the feedback, 60 patients had a proven fracture. In the other cases there was no fracture but a distortion or contusion or the first diagnosis was rejected and no new diagnosis was given. In some cases there was simply no second ICPC code to compare with. Of the 60 patients with a fracture, 35 were referred to the A&E department, 25 were not referred by the GPC.

### 4.3 Unexpected death

Of the 17 patients with an unexpected death, 8 were considered as unavoidable, 7 could have potentially been avoided by GPC and 2 by hospital staff. The GPC referred only one of those 7 people, whereas the other 6 were not referred. Table 3a+b shows the patient characteristics and cause of death. Almost all cases were about elderly patients. Causes of death were: ruptured aneurysm, acute cardiovascular diseases, gastric bleeding, hepatic coma and urosepsis.

There are some main problems that recur in these cases. Often the triage was inadequate due to improper questioning. In some cases the doctor did not perform a physical examination. This resulted in a doctor's delay. Other problems emerged because the GPC had no access to the patient's records and information about medical history, such as allergies, was unknown at consultation time.

Fig. 3

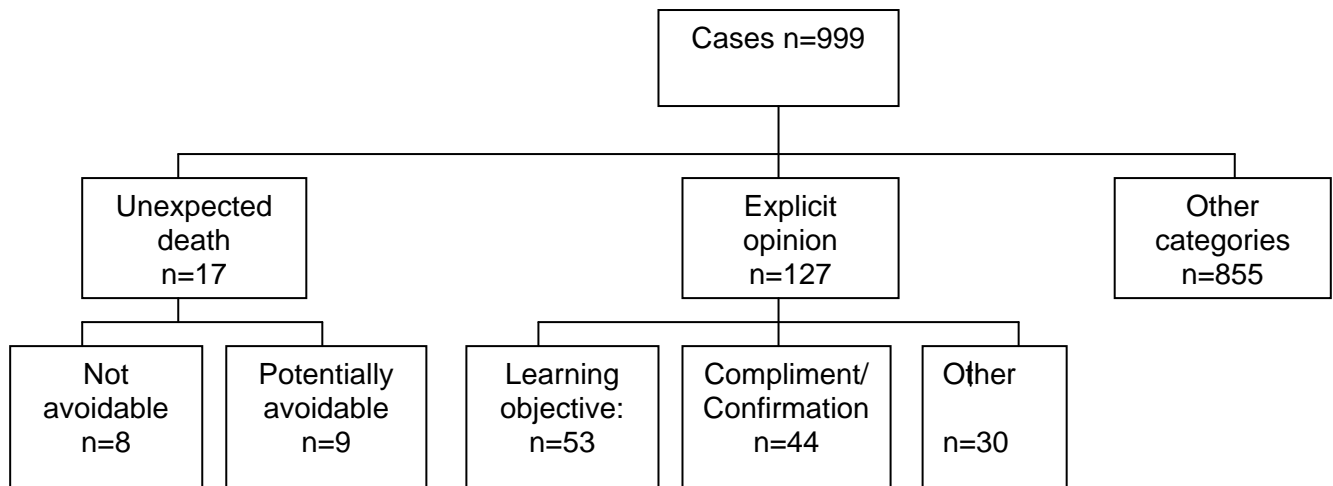


Table 3a: Unexpected deaths, could have potentially been avoided by GPC, n=7

Sex	Age	GPC referred to hospital	Evaluation of actions of the GPC	Cause of death
F	72	No	Physical examination inadequate Access to patient record would have been useful	Unknown
F	57	No	Limited differential diagnosis Physical examination inadequate	Leaking aneurysm
M	81	No	Limited differential diagnosis Physical examination inadequate	Cardiovascular
F	92	Yes	Triage problem Patient should have been visited at home and thus doctor's delay	Cardiac ischemia
F	89	No	Physical examination inadequate Doctor's delay Limited documentation on part of the GPC	Unknown
M	47	No	Triage problem Patient should have been visited at home or consulted and thus doctor's delay Access to patient record would have been useful	Gastric bleeding and hepatic coma
F	91	No	Triage problem Patient should have been visited at home or consulted and thus doctor's delay	Urosepsis

Table 3b: Unexpected deaths, could have potentially been avoided by hospital staff, n=2

Sex	Age	GPC referred to hospital	Evaluation of actions of the hospital staff	Cause of death
M	81	Yes	The patient was known to have an aneurysm, but no tests were done to see if there was a rupture and the patient was sent home	Ruptured aneurysm
M	68	Yes	Was admitted to hospital but was sent home too early	Acute myocardial infarction

#### 4.4 Learning objectives

In 12.7% of all feedback cases an explicit opinion was given containing a learning objective, a compliment or confirmation or other comment.

There was an explicit opinion containing a confirmation or compliment in 4.4% of all feedback, meaning the GPC did a good job and that for example the family of the patient was content with the treatment or communication.

In 5.3% there was an explicit opinion containing a well-defined learning objective. To show the information about cases with a learning objective clearly in a table and to show which

type of problems occur mostly, 39 cases were grouped according to the ICPC code of the eventual diagnosis. Table 4 shows the diagnosis made by the GPC, the second diagnosis given in the feedback and the reason why there was a learning objective. Just like the cases of 'unexpected death' in the previous paragraph, the learning objectives of these cases are also about triage, physical examination and limited differential diagnosis, all leading to a doctor's delay.

Of the 13 cases about circulatory problems, 5 were about cerebrovascular accident; the rest had other acute vascular diseases such as thrombosis, myocardial infarction, heart failure, pulmonary embolus and cardiomyopathy. Also in other groups such as musculoskeletal tract, digestive tract and respiratory tract, nearly all cases are about acute health problems.

Table 4: learning objectives, cases according to diagnosis and problem

First diagnosis by GPC (n)	Second diagnosis, written in feedback message by GP (n)	Number of Patients	Reasons why there is a learning objective
K: Circulatory (13)	CVA	5	Triage inadequate Differential diagnosis too limited Physical examination inadequate Delay*
	Thrombosis	2	No attention for medical history Complication due to delay in treatment
	Myocardial infarction	2	Differential diagnosis too limited Atypical presentation Delay*
	Heart failure	1	Differential diagnosis too limited
	Pulmonary embolus	1	Questioning of patient and physical examination inadequate Delay*
	Cardiomyopathy	1	Physical examination inadequate Delay*
	Other cardiovascular disease	1	Differential diagnosis too limited
D: Digestive (7)	Ileus	3	Differential diagnosis too limited Patient should have been visited at home or consulted Inadequate physical examination
	Appendicitis	2	Unexpected diagnosis Delay*
	Malignancy of colon	1	Physical examination inadequate Delay*
	Cholecystitis	1	Questioning of patient inadequate
A: General (5)	Reaction/allergy to medication	2	Prescription There was no access to patient records and medical history
	Urosepsis	2	Patient should have been visited at home or consulted Inadequate questioning and physical examination Unrecognized alarm symptoms Delay*
	Accident/injury	1	No indication for tetanus prescription, accident was indoors
S: Skin (5)	Animal bite	4	Prescription, there was an indication for antibiotics but this was not prescribed
	Varicella Zoster infection	1	Symptoms not recognized Prescription for antiviral medication should have been given Delay*
L: Musculo-skeletal (5)	Fracture	5	Not recognized symptoms Triage inadequate Delay*

R: Respiratory (4)	Pneumonia	3	Differential diagnosis too limited Patient should have been visited at home or consulted Inadequate triage Inadequate physical examination
	Pneumothorax	1	Inadequate physical examination Delay*

\* Delay: a doctor's delay, delay in referral and/or treatment of the patient

## 5. Discussion

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### 5.1 Measuring instrument

The first aim of this study was to develop a classification system. The measuring instrument was reliable for categorizing this feedback data, because the average Kappa was 0.86 and a Kappa value above 0.75 is considered as excellent.<sup>14</sup> The consultation of experts and the practice test supposed a high face and content validity of the measuring instrument.

Only for the item of "explicit opinion", the Kappa value was lower. This was probably lower because this item requires more interpretation than other items.

### 5.2 Aspects of feedback

One of the main findings was that the feedback was mostly about diagnosis, disease course and hospital admission of the patient. Maybe the feedback is mostly about diagnosis because GPs are interested in the outcome of their medical decisions. Of the patients with chest pain, suspected for heart disease, only one third actually had a myocardial infarction. Retrospectively some of these patients were not referred immediately by the GPC. Of patients with musculoskeletal pain, almost half of the patients who had a fracture were not referred immediately by the GPC.

There was almost no feedback about organisational or communicational aspects. This could mean that there are few organisational or communicational problems. Another possibility is that problems exist but GPs do not give feedback about this.

In order to be able to compare diagnoses, the main complaint or diagnosis was interpreted and labelled by an ICPC code. This is prone to be subjectively, but because of using strict rules on how to do this, the effect on the results is probably very small.

### 5.3 Possibly avoidable deaths

Assuming that GP's always give feedback when there is an unexpected outcome, especially an unexpected death of a patient, there were 7 cases of possibly avoidable deaths out of 999 cases. Nearly all patients were elderly people aged above 70 with asymptomatic complaints and multiple underlying diseases. Out of the whole population of 46,542, the percentage is

0.055%. This percentage could be higher, if there were cases of unexpected death deleted out of the program or if GPs did not give feedback when there was an unexpected outcome. For some reasons the percentage of 0,055 could also be lower. The decision to label cases as possibly avoidable deaths was judged by the information in the SOAP and feedback. This judgment is subjectively, because we do not know the doctor's assumptions when deciding not to refer a patient to the A&E department. GPs do not always record all information in the SOAP registration; some information might have been given in written notes about specific patients. For example notes about patients who do not want to be admitted to the hospital. If these patients pass away, there is no question of possibly avoidable death.

#### **5.4 Learning objectives**

There were 53 cases with an obvious learning objective, mostly about patients with acute diseases. Some main problems recur in these cases and also in the cases of possible avoidable deaths. The GPC had no access to the patient's records, often there was an improper questioning of the patient leading to inadequate triage and lacking of a physical examination and doctor's delay. Although the feedback program was designed to enable GPs to learn from feedback, only a very small proportion contains information with a learning objective.

#### **5.5 Recommendations**

An advice for GPs is to register more adequately in the SOAP registration. Often there is no information about negative findings, or physical examination. The feedback is given according to the SOAP registration, so if the SOAP information is correct, the feedback might be of better quality.

Only 3,8% of all patients visiting the GP cooperative has acute health problems.<sup>15</sup> However, these problems are not always recognized. GPs may need more training in recognizing acute health problems, especially the atypical presentation among elderly patients.

For the GPs who decide to give feedback, other information except for the diagnosis could also be noted more. In future, the electronic feedback program could be adjusted allowing the GP to choose from an option menu. For example the GP could choose an option: "my feedback is about diagnosis". The GPs need the opportunity to label the diagnosis with an ICPC code, because the GP is already trained and knows the patient. All these changes make it easier to perform research at regular intervals without the use of a lot of manpower, which might result in cost-reduction.

Information such as the time of the consultation, if there was a (telephone) consultation or a visit, is not shown in the SOAP information of the feedback program. It would be interesting

to know if there is more feedback about a specific type of consultation at a certain time of the shift. A hypothesis is that more problems occur during early morning hours.

An advice for the telephone triage is that if not enough information can be acquired during a telephone conversation, the doctor should see the patient in order to make a proper evaluation.

Research could be done to investigate if introducing diagnostic tests at the GP cooperative improves the safety of care. For example an X-ray machine, ECG and lab tests such as troponines.

A protocol may be developed for screening fractures, because some patients with a fracture were not diagnosed and other patients were sent to the A&E for no reason.

Further research could be done to find out if the percentage of possibly preventable deaths is correct, by studying patient records in the GP practice.

Another interesting research would be to find how GP's interpret the given feedback. Do they think of the feedback as a learning objective?

Our research is a pilot study only about one GP cooperative in The Netherlands and might not be representative for the rest of the cooperatives in the country. If more GP cooperatives would use the electronic feedback program, then a comparative study can be made in future.

## **5.6 Conclusion**

A reliable measuring instrument was developed for categorizing this feedback data and the developing process guaranteed a high face and content validity. Compared to the large amount of feedback about diagnosis, there was a low percentage about communication and organisation. Possibly avoidable deaths and learning objectives concerned mostly elderly patients with acute cardiovascular diseases. The feedback program is a promising initiative, but still needs some adjustments.

## 6. Literature

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## 7. Appendix

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### 7.1 Modatran feedback program

The program works as follows: The information of a consultation at the GP cooperative is processed into the computer program “call manager” by the doctor on duty. We will call the doctor on duty ‘GPC’ (GP cooperative). This information is stored in a table with the headings “SOAP” (subjective, objective, assessment and plan’) Once a week the patient information about the consultation at the GP cooperative is sent to the patient’s own GP. The GP receives an e-mail notification that there is a message about his patient. The GP’s have a unique inlog code for the Internet site so that they can see patient cases intended only for them (see figure 1).

When the GP is logged on to the site and reads the patient case there are three options to choose from: ‘no feedback needed’, ‘give feedback’ and ‘postpone feedback’, (see figure 2). When choosing the first option, the patient case is deleted. The second option enables the doctor to give feedback to the GPC. If giving feedback is postponed, the GP has 5 weeks time to reply, if there is no reply after 5 weeks the case is deleted.

Certain rules were set up for giving feedback. Feedback has to be brief and must contain facts or interesting information. For example: a patient case with an unexpected disease course or diagnosis would justify for giving feedback. The program is clearly not meant for rude comments and/or value judgments about colleagues. The patient case information with feedback is sent via a secured Internet connection to the GPC. After the GPC has read the information the case is made anonymous and stored. The Webmaster of the computer program cannot access the personal facts of the patient. For that reason the privacy of the patient is secured. <sup>11;16</sup>

Figure 1: Illustration of how the program works

# Working of feedback program

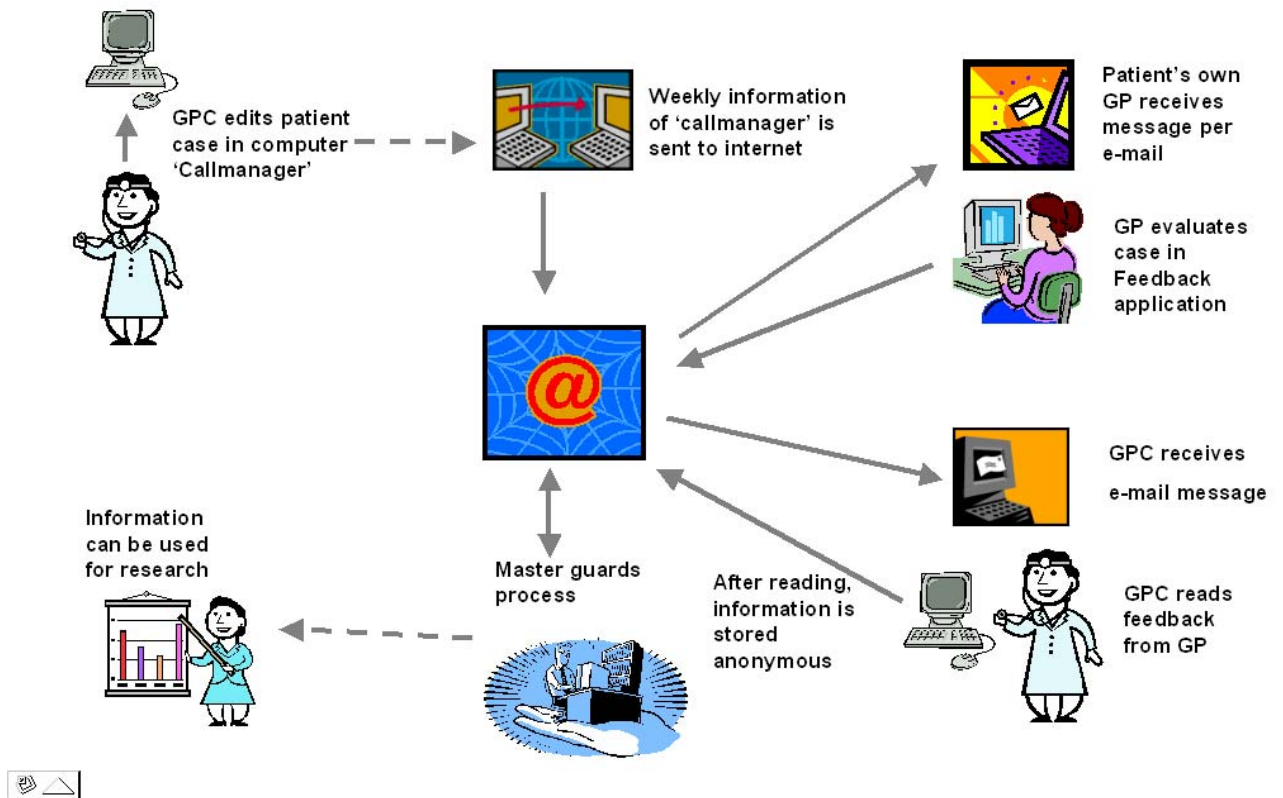


Figure 2. Example of the menu of the feedback program

**FEEDBACK**

Huisarts; H.U.I.Arts

Aantal nog te behandelen Casus: 433

Geen Feedback benodigd      Feedback invoeren      Feedback uitstellen

Patient: \*\*\*\*\* vrouw 27-jun-30 \*\*\*\*\* s-Gravendeel | Bezoekdatum 26-mei-2006

S: recept

O:

E:

P: [NATRIUMCHLORIDE INJVLST 9MG/ML AMP 10ML, imm VENFLON IV CATHETER IN PTFE 18G 45MM, imm INFUUSPLEISTER TTMM STATLOCK PICC PLUS, imm]

ICPC ;

Naam+AGB EIGEN ARTS: \*\*\*\*\* AUTHORISATIEARTS: \*\*\*\*\*

De autorisatiearts is ook ingedeeld voor het geven van kwalitatieve Feedback!

## 7.2 The Manual

Start the DOS program (also see fig 3).

The DOS program works as follows:

On the first page there are two options: "scoring" or "exit". Choose "scoring".

Now choose a group of cases that need to be categorized. Each group contains 50 cases.

Press "Enter" and go to the first case.

Read the message written by the GP during his shift at the cooperative.

S → The subjective experience by the patient of the problem or the 'reason for encounter'.

O → The objective clinical findings

A → The assessment or diagnosis of the patient's problem.

P → The process of care or intervention plan.

Read the feedback from the patients own GP.

F → Feedback

Now start classifying the feedback information using the items on the scoring list.

It is important to classify the feedback only and not the SOAP information.

At the main page, the following functions can be used for the program.

F1 → On the main page: To go from the main page to the main categories and from main categories to the main page.

Enter → Select one or more main categories or subcategories. When selecting a category, it will highlight (this means the answer is "Yes").

F4 → From a main category to a subcategory and the other way round.

Page Down → Next case

Page Up → Previous case

Home → First case

End → Last case

F7 → Exit program

After each case the program will ask to save the case with classified feedback.

Select one or more of the 14 main categories relevant for the feedback:

- |                        |        |
|------------------------|--------|
| 1) ICPC GP cooperative | Yes    |
| 2) Diagnosis           | Yes/No |
| 3) Course              | Yes/No |
| 4) Prescription        | Yes/No |
| 5) Referral            | Yes/No |
| 6) Admission           | Yes/No |
| 7) Advice              | Yes/No |
| 8) Diagnostic tests    | Yes/No |
| 9) Treatment           | Yes/No |
| 10) Organisation       | Yes/No |
| 11) Communication      | Yes/No |
| 12) Not to classify    | Yes/No |
| 13) Explicit opinion   | Yes/No |
| 14) Supplementary      | Yes/No |

Select (with "Enter") one or more of the main categories. This means the answer is "Yes". Press F4 to go to the accompanying subcategories. Now choose one or more of the subcategories. Select with "Enter".

If you do not select one of the main categories, than the answer is automatically "No".

#### 1)2) ICPC code GP cooperative/GP:

The main complaint or diagnosis made by the GP can be matched to an ICPC code (International Classification of Primary Care). So the GP on call at the cooperative (GPC) can give the ICPC code and later the patient's own GP can also give a code.

When the same ICPC code is given twice this means the GPs agree with each other about the diagnosis. A difference between the ICPCs means the GP has an other opinion about the diagnosis, or has more information about the definitive diagnosis. Often the GPC and/or the GP give no ICPC code at all, so the ICPC must be interpreted using the diagnosis, differential diagnosis or main complaint of the patient. When this is not possible, the consequence is that the ICPCs cannot be compared. Another possibility is that the GP rejected the diagnosis from the GPC, but did not give a new diagnosis.

In the DOS program the ICPC from the GPC has to be filled in first: The ICPC can be derived from the information in the message of the GPC.

Select "ICPC cooperative" → press F4 → answer the question: Search ICPC with words; Yes/No.

When choosing yes ("Y"), fill in the main diagnosis in words. The program searches the right ICPC. When you choose no, then give the ICPC code exactly, for example R81 for pneumonia.

If the GP gives a diagnosis in his feedback, select "Diagnosis" → press F4 → fill in the ICPC exactly or search with words. If there is no diagnosis given in the feedback, do not select "Diagnosis."

If the GP rejected the diagnosis from the GPC, but did not give a new diagnosis, choose M99 as ICPC code of the GP.

*For example: There is a patient with chest pain. The GPC thinks about a myocardial infarction and refers the patient to the hospital. But after further research it turned out the patient had no myocardial infarction. In his feedback the GP rejects the diagnosis myocardial infarction but does not give a new diagnosis. ICPC 1: K01, ICPC2: M99*

### 3) Course:

The course of the patient can follow different pathways. Here are some explanations of the different subcategories:

- "Condition improved" means the patient recovered or has fewer complaints than before and was not hospitalized.
- "Condition unchanged" means the condition did not improve or worsen.
- "Condition worsened" means the patient has more complaints or the physical condition worsened.
- "Patient passed away"
- "Patient passed away unexpectedly" by this we mean that the patient suddenly died and that the cause was not related to earlier diagnosis. Or that the wrong diagnosis was made earlier.

*For example: Patient complains of back pain. This was diagnosed as muscular pain. The patient was given painkillers and advice to report to his own GP the next morning. The feedback is: "patient died, post-mortem autopsy showed a ruptured abdominal aneurysm".*

Unexpected is not when a patient dies who was already terminally ill.

- "Other" When there is feedback about the course, but this cannot be classified in one of the subcategories.

#### 4) Prescription:

- “GP writes a new prescription after all” This means that the patient did not get a prescription from the cooperative and that this was later given by the own GP.
- “The GP changed the type of drug” meaning the GP wrote a new prescription for another type of drug than the GPC gave to the patient.
- “The GP changed the dosage of medication” The patient had a prescription from the GPC and the own GP changed the dosage.
- “Other” When feedback is about prescription, but cannot be classified into one of the above categories.

#### 5) Referral:

- “GPC” Choose this option if the feedback is about referral of the patient to the A&E department of the hospital by the GP cooperative.  
*For example: “It was not necessary to refer the patient to the A&E department”.*
- “GP referred patient after all” meaning the patient was not referred by the GPC, but later referred by GP to the A&E department.  
*For example: GP referred patient to the A&E department and it turned out that he/she had a fracture. The patient was not referred by the GPC. In this case choose: Referral yes → GP referred patient after all.*  
*When there is doubt if the patient was sent to the hospital only for a X-ray, or to the A&E department, choose: Referral → GP referred patient after all. Not: main category “GP requests further diagnostic tests”. Not: “GP referred to a specialist”.*
- “GP referred to specialist” meaning GP referred patient to a specialist of an OPD (out patient department); a physiotherapist or psychologist.

## 6) Admission:

This is when the feedback is about a patient who was admitted to the hospital, or another institute.

- “Hospital” when a patient is admitted to the hospital, or:  
For example: “Patient was hospitalised for 3 days”, or “Patient received a pacemaker” or “Patient has been operated for a ruptured aneurysm.” This means the patient was treated during hospital stay. For these examples also fill in: Treatment: other.  
*Also when a patient is hospitalized after a few weeks, fill in: Hospitalisation.*
- “Nursing home”
- “Other” When feedback cannot be classified into one of the above categories.

## 7) Advice:

The GPC made a decision about the therapy or gives advice to the patient GP.

- “GPC gives advice” means the GPC gives an advice to the patient or to the GP. This advice should be written in the message of the GPC.
- “Advice followed up” means the GP starts or continues the therapy initiated by the GPC, or the patient comes to the consulting hour because the GPC advised him to do this. Choose this option only if this is explicitly written in the feedback.  
*For example: The GPC advised the patient to go to the GP the next day, and the feedback is: “Next morning the patient came to my consulting hour...”*
- “Advice not followed up by GP” means the GP did not start, or discontinued the therapy of the cooperative, or did not follow the advice of the GPC.
- “Advice not followed up by patient” means the patient did not start, or discontinued the therapy, or did not follow the advice of the GPC.  
*For example: GPC explicitly advised the patient to go to the GP the next day for follow up, but the feedback informs that the patient did not show up.*
- “Other” When feedback cannot be classified into one of the above categories.

## 8) GP requests further diagnostic tests:

This means the GP requests tests, such as an X-ray, laboratory tests, urine tests or an ECG, which is evaluated by the GP himself.

- “GP requests further tests”
- “Other” When feedback cannot be classified into the above category or when the feedback is about diagnostic tests in hospital.

*For example: Further diagnostic tests were done, but it is unclear if these were requested and evaluated by the GP or by the specialist. Then choose: Diagnostic tests → other.*

#### 9) Treatment by GP:

- This means that when the patient visited the GPC no treatment was given. Later the patient's own GP started treatment.
- "Treatment by GP"
- "Other" When feedback cannot be classified into the above categories or when the feedback is about treatment in hospital.

*For example: "The patient has been operated for the ruptured aneurysm of his aorta". Then choose: Treatment → Other, but also hospitalisation: patient admitted to hospital.*

#### 10) Organisation:

The feedback is about the organisation at the GP cooperative.

*For example: Missing of patient information, or the patient could not come to the GP cooperative because of transportation problems.*

#### 11) Communication:

The feedback is about the communication for example between the patient and GPC or medical assistant.

This can be about a language problem, patient used drugs or the patient cannot tell the GPC about his complaints and someone else has to do this for him, for example his partner.

#### 12) Not able to classify

This means the feedback cannot be classified in one of the other main categories.

*For example: "Patient did not show up at the consulting hour" without explicit advice of the GPC. "I did not have any contact with the patient so far". "Until now I heard nothing from the patient".*

#### 13) Explicit opinion:

- "Learning objective" In the feedback the GP gives an opinion about the medical decisions of the GPC. This can be interpreted as a learning objective.
- "Confirmation/Compliment"  
*For example the feedback says: "Well done! I agree with you" or "indeed..."*
- "Other" When feedback cannot be classified into one of the above categories.

#### 14) Supplementary

- “PM case” Select this option if the patient case is useful for further research or as an example for educational means.
- “GPC referred patient to A&E department” If there is information in the message of the GPC about referral of the patient to the A&E department. This time read the information in the SOAP!

*For example: GPC writes in his message he referred the patient to the A&E department for an X-ray. Or the patient with stomachache was referred because of a possible appendicitis.*

*The end of the manual*

### 7.3 Appendix Table 1: Prevalence of different aspects of feedback and frequency

Aspect	Percentage out of total number of cases (n=1000)
Diagnosis	69,9
Course	27,7
▪ Condition improved	15,7
▪ Unchanged	1,1
▪ Condition worsened	3,1
▪ Patient passed away	4,3
▪ Unexpected	1,9
▪ Other	3,5
Prescription	5,3
▪ GP writes a prescription after all	3,0
▪ GP changed medicine	1,2
▪ GP changed dosage medicine	0,2
▪ Other	0,8
Referral	14,9
▪ GP cooperative	0,2
▪ GP referred the patient after all	7,4
▪ GP referred to specialist after all	7,1
Admission	19,0
▪ Hospital	17,3
▪ Nursing Home	0,9
▪ Other institute	0,4
Advice	4,5
▪ GP cooperative gives advice	4,2
▪ Followed	3,4
▪ Not followed by GP	0,1
▪ Not followed by patient	0,8
▪ Unknown	0,0
Diagnostic tests	5,3
▪ GP requests further diagnostic tests	2,5
▪ Other	2,8

Treatment	11,9
▪ Treatment by GP after all	0,5
▪ Other	11,4
Organisation	1,0
Communication	0,7
Not able to classify	12,8
Explicit opinion	12,7
▪ Learning objective	5,3
▪ Confirmation/compliment	4,4
▪ Other	3,0
Supplementary	
▪ GP cooperative referred patient to A&E department	38,0